

University of Michigan Health System: Nephrology Clinic Efficiency Analysis, Final Report

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Date: December 4, 2003

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EXECUTIVE SUMMARY

Problems with efficiency, causing low patient satisfaction rankings, have recently become a priority for improvement at the University of Michigan Hospital System Nephrology Clinic. Although efficiency has improved somewhat over the past few years, physicians in the clinic are continuously looking for more effective methods of improvement.

During the study, the student team analyzed the clinic through the following methods:

- **Clinic Observations.** The team oversaw daily operations in the clinic over a span of six weeks, considering operations including patient flow, paperwork flow, scheduling, billing, clinical staff responsibilities, and management involvement. Throughout the observation period, the team conducted several informal interviews with both patients and physicians.
- **Time Study.** This study was held over a one-week period. It allowed patients to document their own flow through the clinic and provide feedback on improvement.
- **Analysis of scheduling data, billing data, patient satisfaction data, and other pre-gathered reports** to display percentage of unique patients, physician access, appointment availability, continuity of care, physician efficiency, cancellation rate, new-patient to return-visit ratios, patient satisfaction, and common diagnoses.

After analyzing the data collected, the team generated the following recommendations:

- **Utilize available electronic resources to improve physician and other staff's efficiency.** Many resources are currently available through the hospital that the clinic either does not use to its full potential or does not use at all.
- **Increase communication between operational entities within the clinic.** During a patient visit, usually three to four staff members see the patient at one point. Increased communication would help to expedite the process. Also, divisions such as the call center, clerical staff, and clinical staff have few connections to each other. Increased support from management and increased effort from everyone would increase communication.
- **Improve the scheduling system to better align supply and demand in the clinic.** Scheduling breaks to allow physicians (the current system) is not an efficient way of utilizing resources. Physician will work more efficiently if these breaks are removed and appointment times were lengthened to better reflect the time a physician requires with a patient.
- **Incorporate the renal and transplant divisions into one operation.** This will be the most difficult recommendation to follow due to issues with human resources. However, discrepancies in the call centers are causing many errors, leading to cancellations; the separation also causes confusion amongst staff members.

Successful implementation of the recommendations with all staff involvement will cause:

- Decreased cancellations, and more importantly, "no shows"
- Increased appointment accessibility
- Increased new patient to return visit ratio
- Increased physician productivity
- Increased continuity of care
- Increased patient satisfaction
- Increased overall clinic efficiency

1 INTRODUCTION

Throughout the project duration, the team acknowledged confidentiality and protected health information (PHI). Each team member signed the UMHS confidentiality agreement before beginning the project.

1.1 Purpose

The staff at the University of Michigan Nephrology Clinic (UMNC) expressed interest in studying the efficiency when scheduling and conducting appointments and how it affects patient satisfaction. The purpose of this project was to thoroughly analyze the activities involved at the UMNC (including the phone call process, scheduling, and the patient visit process) and compare the analysis to best practices in other clinics. This document describes the plan that was taken and provides recommendations to improve efficiency in the clinic.

1.2 Goals and Objectives

The goal of the project was to increase efficiency and patient satisfaction in all operations involved in the UMNC. The basis for data judgement and comparison came from productivity (estimated by work RVUs (Relative Value Units)) and patient satisfaction survey results. Factors affecting productivity and patient satisfaction are staff utilization, the patient phone call system, and information systems in the clinic, among others.

1.3 Background

The UMNC physicians expressed an interest in identifying the areas needing improvement in the clinic. Improving efficiency will directly increase patient satisfaction, which is determined by two main criteria: the time taken to get an appointment and the time spent waiting to see the doctor.

The UMNC provides routine care for renal patients. The clinic operates in clinic 3D on the third floor of the Taubman Center at the University of Michigan Health System (UMHS). It operates on Mondays, Wednesdays, and Fridays from 8 am to 12 pm, and Tuesdays from 12 pm to 4 pm. Appointments are scheduled in 20-minute blocks.

The clinic is staffed with providers (MDs, includes fellows), Renal Nurses, Transplant Nurses, Medical Assistants (MAs), two check-in staff, three scheduling staff, and two billing staff. Clinic staff does not include the staff at the call center in clinic 3D. Rooms are assigned to MDs by room number before the clinic starts so that a MD on staff can receive one or more rooms depending on the day and number of patients scheduled. They are only allowed to use the rooms assigned to them regardless of how many patients arrive.

Patients are grouped into two major categories: Transplant and Renal. Transplant Patients include pre and post transplant care. Transplant patients are recognized as such when they put their name on the transplant list. Renal Patients include all other types of care. Patient type is the ultimate factor determining clinic flow, as shown in Appendix B.

The stakeholders identified a number of main areas that have been explored:

- Physician and staff utilization
- Exam room utilization
- Communication between the physician, and both the staff and the patient

2 APPROACH AND METHODOLOGY

The student team examined all scheduling (both patient and employee) and operational activities (including the phone call process, scheduling, billing, and the patient visit process) in the UMNC. The primary parties involved in this project included physicians and the clinic manager; however, all positions involved in the clinic were studied. These positions included nurses, clerks, medical assistants, house officers, call center staff, and clinic management.

2.1 Scope

The Nephrology clinic in the UMHS was the only location studied. All clinic operations studied took place in the Taubman Center 3D Clinic. The student team spent a great deal of time analyzing billing and scheduling data, waiting times, and call data to determine the source of the current problems. The project excluded clinical quality and effectiveness of care. Also excluded from the analysis were fellows and other students and their effects on overall clinic efficiency.

2.2 Methodology

The key phases of this project include data collection, data analysis, literary research, and finally a presentation of the final report. The detailed approach was as follows.

- Observed clinic operations on a weekly basis for 6 weeks, beginning on October 3, 2003, to collect data and form a basis for comparison.
 - Followed MAs, MDs, and Nurses to attain practical knowledge of the tasks performed within the clinic
 - Documented information and chart flow through the clinic
- Conducted time study and collected:
 - Average wait times throughout the different stages in the clinic
 - Average time spent with each type of staff member
 - Survey of patient satisfaction with respect to:
 - Time to schedule an appointment
 - Time to see the doctor
- Flowcharted all clinical operations and information systems
- Informally interviewed physicians
- Collected phone call data
- Analyzed billing data, scheduling data, treatment type, staff responsibilities, and other necessary data gathered by the client, thereby avoiding access difficulties
- Developed recommendations for UMNC
- Met weekly with both the client and project coordinator

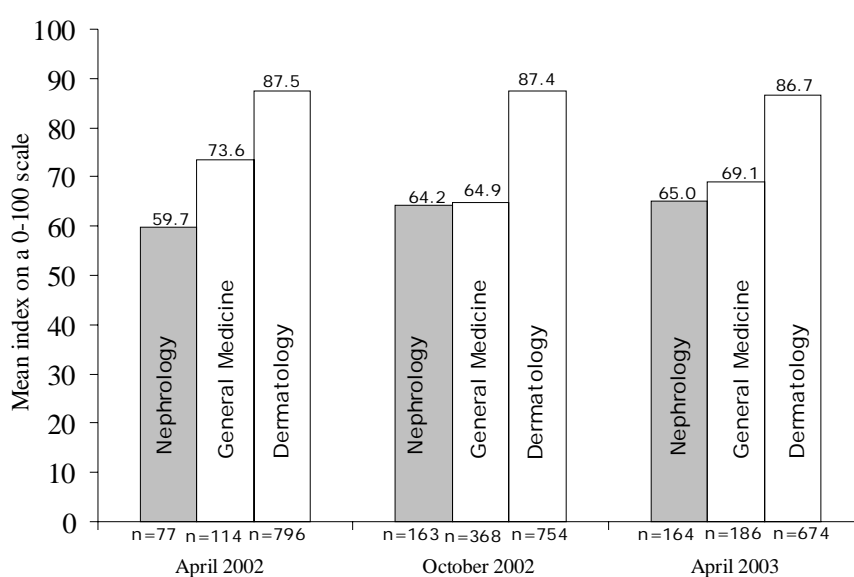
3 FINDINGS AND CONCLUSIONS

3.1 Patient Analysis

Office visit satisfaction surveys are conducted regularly in both April and October of each year. Currently at UMHS, Dermatology has the best overall performance in the survey; thus it is a good source of comparison for the Nephrology clinic. Another interesting comparison is the General Medicine Clinic (also in UMHS), which is thought to have very similar operations to Nephrology.

The results are displayed for two service characteristics rated on the survey: Length of time at office/clinic from the scheduled appointment until seeing the doctor, and length of time between making an appointment and the day of the visit. These categories were Nephrology’s worst overall ratings; however they are perhaps the two most significant indicators of patient satisfaction.

Figure 1: Comparison of Patient Satisfaction Ratings Involving Time Spent at Clinic



Although it has increased over five points in the past year and a half, patient satisfaction regarding the length of time spent at the Nephrology clinic from the scheduled appointment time until seeing the doctor is low, as displayed in Figure 1. “Decrease time waiting in exam room before seeing the doctor” was one of the numerous written comments from a patient collected through the time study. The nephrology clinic does have room to increase this score in the future.

Based on the same surveys, patient satisfaction regarding the length of time between scheduling an appointment and the day of the visit is also low in Nephrology with an average ranking of 69 on a scale of 0-100. However, the score is comparable with the results in other clinics. (Dermatology and general medicine’s average rankings are 70.5 and 70.2, respectively.) The score has also grown somewhat over the past year, but it is currently approximately 5% lower than dermatology.

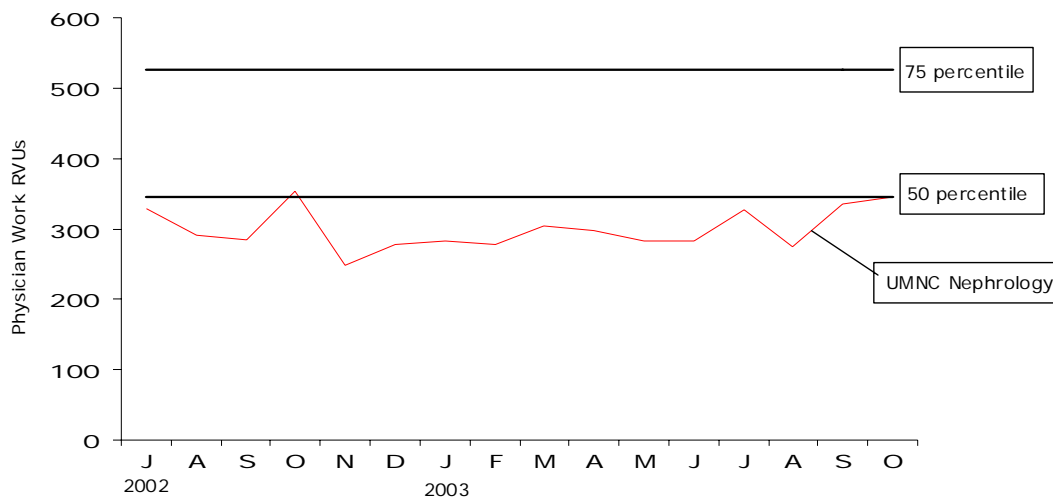
Patient demographics in the Nephrology clinic were taken from billing data¹. An approximately equal number of male and female patients exist. However, the patients’ sex differs between renal and transplant patients. Transplant patients have about 10% more females than renal patients.

¹ IDX: Neph Clinic Subsites: 256, 1007, 1014, 4181; Neph Transplant Subsites: 1008, 553; idxDivision = 303 (Internal Medicine); idxBillingArea = 1071 (Nephrology); idxSite = 1 (Taubman Center). Time Period: FY02-FY03.

In the entire Nephrology clinic, there are 3741 unique patients. Of the unique patients, 1489 patients are solely transplant patients, and 1889 are renal patients. Since the total number of transplant and renal patients does not sum to be 3741, there is a discrepancy in 10% unique patients (363 patients), who are considered neither transplant nor renal patients. The discrepancy is apparently the result patients may have switched from renal to transplant in the time period or system errors.

Figure 2 below displays the trend of work RVUs in the Nephrology clinic over the past 1.5 years. Compared to MGMA Academic Practice² statistics, UMNC data falls just below the median values.

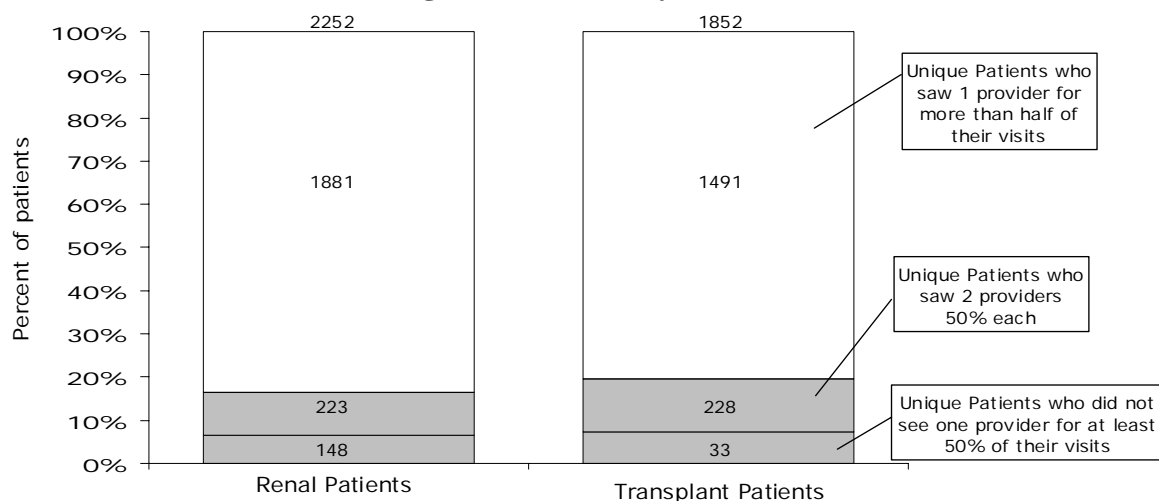
Figure 2: Work RVUs: UMNC versus MGMA Academic Practice



3.2 Scheduling Analysis

Scheduling in the UMNC was studied based on observations during open hours and data analysis. The following graphs present the analysis and its affects on scheduling.

Figure 3: Continuity of Care



Eighty percent of patients regularly see one physician, meaning that continuity of care³ is relatively high in the Nephrology clinic (Figure 3). There is very little difference in continuity of care between

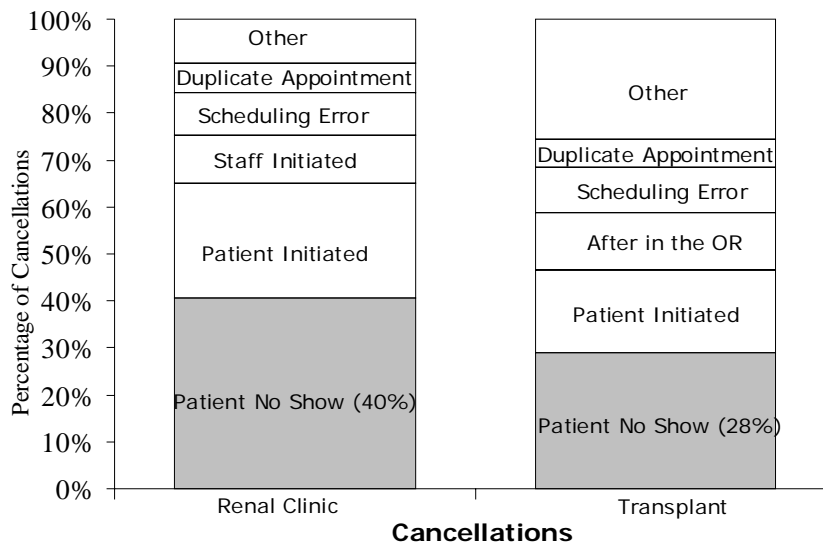
² Notes: RVU = Relative Value Unit, measured by the CMS RBRVS Method using billing data.

Sources: MGMA Academic Practice Compensation and Production Survey for Faculty & Management: 2003 report based on 2002 data, IDX, Period: 07/01/02 – 10/31/03. A four-hour session of clinic time is equivalent to 0.1 FTE per CCB.

renal and transplant patients; thus continuity of care is consistent throughout Nephrology. This has a very positive effect on the efficiency in the clinic. Physicians will work more efficiently if there is an effort to schedule physicians with their own patients.

Appointment cancellations⁴ sum to over 25% of the scheduled appointments in the Nephrology clinic. Of the total cancellations, renal visits make up over 60%. Since renal visits represent only 40% of all visits, the most effort should be invested to lower cancellations in the renal clinic; however, transplant cancellations should not be overlooked.

Figure 4: Reasons for Cancellations of Appointments in FY03



As shown in Figure 4 above, patient “no shows” make up one third of the total number of cancellations in the clinic. Patient initiated cancellations, which are the hardest cancellations to avoid since they are in the patients’ control, compose about 20% of all cancellations. However, staff initiated cancellations, which compose over 5% of cancellations can be avoided. Scheduling errors and duplicate appointments (both errors from scheduling) combined total over 15% of cancellations. This is a huge percentage of cancellations that can be avoided by increased communication within scheduling.

An important clarification in the cancellation data is that the statistics do not include appointments that have been rescheduled. Rescheduled appointments are recorded differently; thus they are not incorporated in the data.

Third available appointment (TAA) is recognized as the most relative indicator to represent patient access in scheduling appointments. The number of days to the TAA in the Nephrology clinic has steadily decreased from 85 to 52 days over the past year⁵. A continued effort to align supply and demand by increasing efficiency in scheduling will decrease this number even more in the future. The TAA for new patients was found to be 80.89 days⁶, which is significantly higher than the average

³ IDX FY02-03.Excludes the following codes because they are not identified as unique patients: 89900 (Donor Eval), 89901 (Recipient Eval), 90921 (Maintenance Dialysis), 239237, 239238 (Dummy patient ids).

⁴ EWS FY03. Cancellation data does not include rescheduled appointments. Cancellation rate = (# Cancellations)/(Total # appointments made).

⁵ Ambulatory Care Access Report: columns with N/A in them were ignored in the calculation because N/A could mean several different things such as no appointment available within 180 days, or it could mean there are inconsistencies with the MD templates, or that an MD is out for an extended period of time.

⁶ TAA for the new patient appointment type only, average for Q1 04.

third available appointment of 65.67 days⁷. The new patient number should be lowered to allow easier access to new patients, thereby increasing the new patient to return visit ratio.

Based on two years of billing data⁸, the Nephrology clinic's average new patient to return visit ratio differs slightly for renal and transplant patients. The average new patient ratio for renal patients is 20.7%, while the same ratio for transplant patients is 16.4%. These figures are fairly consistent over the past two years. Figure 5 shows the results for renal patients only.

Figure 5: Renal New Patient and Return Visits

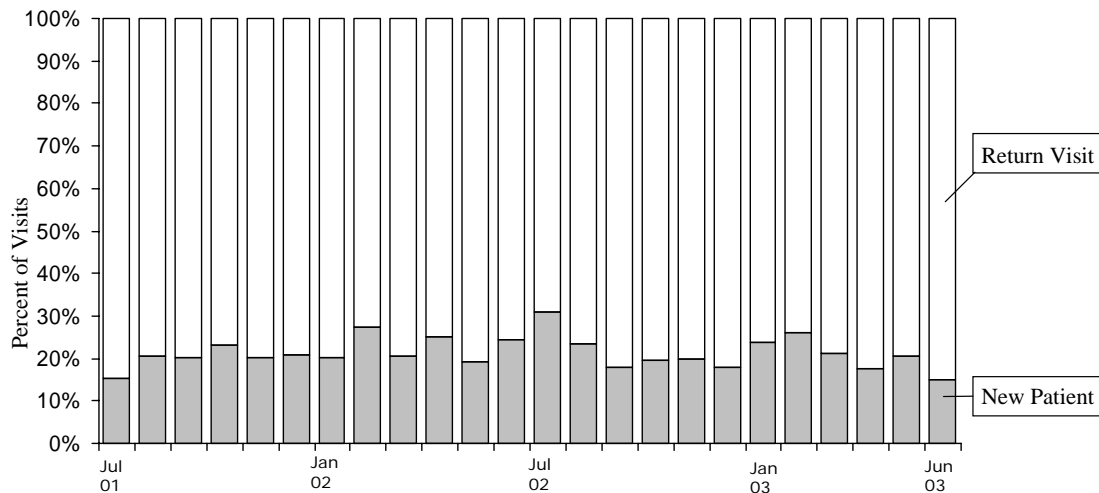
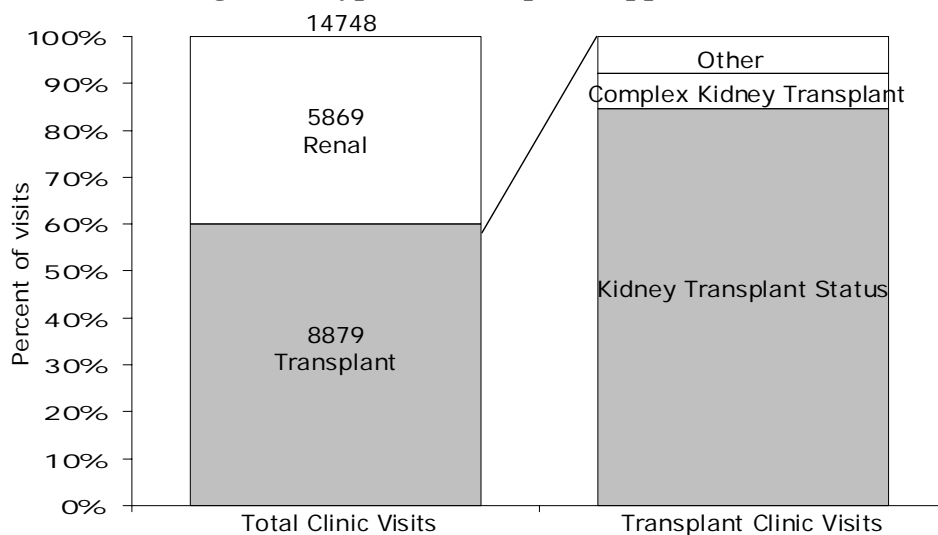


Figure 6 displays common diagnoses for transplant patients. Over 85% of all transplant visits are consistently for kidney transplant status⁹. Although this may include a wide variety of patient needs, physicians should communicate with other staff as much as possible so that they can ensure an efficient method of seeing patients. Renal visit types cover a broad range of diagnoses; however communication is still essential to efficient clinic operations.

Figure 6: Types of Transplant Appointments



⁷ Average TAA for all appointment types for Q1 04.

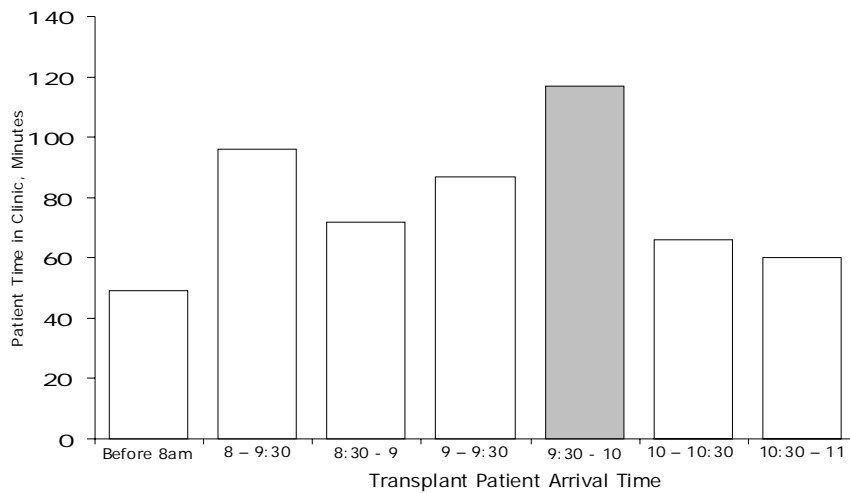
⁸ Excludes the following codes because they are not identified as unique patients: 89900 (Donor Eval), 89901 (Recipient Eval), 90921 (Maintenance Dialysis), 239237, 239238 (Dummy patient ids). Includes the following codes: NPRV (Idxproccp4Cd), NP (99201-5, 99242-5), RV (90085, 90921, 99211-5).

⁹ IDX: idxDx1. FY03.

3.3 Clinic Operations Analysis

Overall analysis of the time study¹⁰ results proved that renal visits are very similar to transplant. One conclusion is that patients spend a longer time waiting in the clinic than spent with a medical staff member. Distribution of times spent in the clinic is displayed in Figure 7.

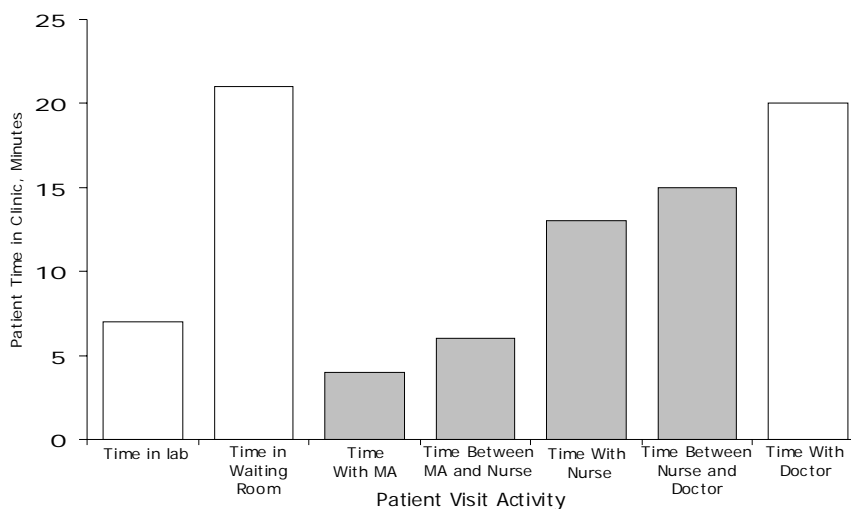
Figure 7: Transplant Patient Arrival Times



The patient visit length peaks at approximately 10 – 10:30 am during morning clinic hours. Based on observations, this bottleneck is attributed to many factors including length of time spent in lab, time each physician spends with patients, and patient arrival times. Regardless of the patients’ scheduled appointment time, observations showed that many patients arrive around the peak time. This results in a large bottleneck throughout the clinic. “I did not arrive early, so the wait was longer,” commented one patient.

Figure 8 shows that patients spend an average of nearly 40 minutes waiting for the physician. While the patient is in the exam room, the physician spends some time reviewing the patients’ medical paper files due to inefficiencies in the paperwork flow. Use of electronic resources will lower this time. “Decrease time waiting in exam room before seeing the doctor,” commented one patient.

Figure 8: Distribution of a Transplant Patient’s Time During Their Visit



¹⁰ Conducted October 29 – November 5, 2003. Transplant sample size = 37. Renal sample size = 23.

4 RECOMMENDATIONS

Based on observations in the Nephrology clinic and thorough analysis of the data collected, the student team has developed several recommendations, which will improve the overall effectiveness, efficiency, and patient satisfaction of the clinic. These recommendations include the use of electronic resources, development of the organizational structure in the clinic, and an improvement in the scheduling system.

4.1 The Use of Electronic and Other Resources

To decrease patient wait time, increase physician efficiency, and increase communication among Nephrology clinical staff members, we strongly suggest using the following electronic resources. The online and phone resources are all currently available through the hospital, and have been successfully implemented in other clinics.

- Create an online problem summary list for each patient. This list will include the medical history, current medications, allergies, and other known medical conditions. The physician can examine the patient's information without having to wait for the paper file to be delivered, or before the patient arrives. This will reduce the time that the patient has to wait for the physician in the exam room.
- Use the Scriptwriter program to allow the physician to print out the patient's prescription and fax it to the pharmacy. This will reduce the volume of calls received by the call center regarding prescription orders and renewals.
- Use the Care Web Program to enable nurses to create online notes and handle patients' questions online. This will reduce unnecessary patient visits to the clinic and also the volume of calls received by the call center for medical advice.
- Use the LabTalk program to allow patients to receive an automated lab follow-up. The charge is only \$0.75 per call. This will reduce the number of patients waiting for results (in the exam rooms and waiting rooms) and the amount of time nurses spend on follow up calls to patients. The volume of calls coming into the call center would also be greatly reduced.
- Give pagers to patients at the clinic waiting for their lab results. The patient will be free to travel around the hospital while waiting for their lab results. The pager will notify the patient when the results are ready. This will decrease patient wait time in the exam or waiting rooms and increase patient satisfaction.

4.2 Development of the Organizational Structure of the Nephrology Clinic

The current structure in the clinic would be significantly improved by an increased effort in communication throughout the clinic.

- Appoint a medical director or operations manager to oversee all clinic operations. Currently each operation has its own individual manager. The addition of a manager that oversees all of the operations will allow these operations to flow together more smoothly.
- Integrate the transplant and renal call centers. It is unnecessary to have two separate centers to schedule these standard appointments. One call center is able to handle the entire volume of calls for the clinic.
- The renal nurse on duty in the clinic should be relocated to an area where he/she can perform their work. At their current position, patients asking general questions are constantly interrupting them. A less costly staff member, such as a MA or clerk, should be located at this position in the clinic.
- The staff members should carry out a "morning huddle" at the beginning of each day in clinic. The purpose of this huddle is for the staff to communicate their duties for the day and to set a team plan. The clinic will run more efficiently, and each physician will possess a higher level of productivity.

- A monthly meeting should be scheduled to discuss the activities in the clinic and methods of improvement. Every staff member should attend this meeting including physicians, nurses, MAs, clerks, managers, and call center operators.

4.3 Scheduling Improvement

Scheduling represents the source of communication with patients. Increased efficiency in scheduling will increase patient satisfaction immensely by decreasing errors and increasing availability, among other effects.

- Align the rates of resources and availability instead of scheduling breaks for physicians to catch up. This will result in a decrease of patient and physician waiting times and also increase the efficiency of the clinic.
- Continue scheduling medical students with their own rooms. This prevents them from having to use the scheduled physician's resources.
- Increase the continuity of care in the clinic. If possible, the patients should see the same physician at each of their return visits. The physicians will perform more efficiently with continuity of care.
- Shorten the time between scheduling and the appointment time to reduce the number of no-shows and cancellations.
- Call the patient at a specified time prior to their appointment to remind them, reducing the number of no-shows.
- A transplant patient going to lab on the morning of their appointment should be given two separate appointment times: the first for lab and the second for seeing the physician. While it is not currently possible to schedule an appointment with the lab, when patients see the actual time (rather than "arrive 30 minutes prior to your appointment"), it may register more effectively in the patient's mind, thereby reducing the amount of patients that come late to scheduled appointments.
- Schedule the same type of appointment on a given day to streamline appointments for transplant checkups. This scheduling change will increase the efficiency of the clinic and allow for smoother patient flow through the clinic.

Through data collection and analysis, our team was able to identify the main problem areas effecting the clinic and make sound recommendations that the Nephrology Clinic should consider in terms of benefits and improved efficiency. Both of these would ultimately lead to improved patient satisfaction, which has been the main gauge used throughout this study when measuring the success of the clinic.

5 IMPLEMENTATION PLAN

This plan is to be used as a rough guideline as to how and when the recommendations listed above should be implemented. During implementation, the clinic should not see any substantial cost increase. The most difficult part will involve significant staff training. Physicians, nurses, and MAs will require heavy training on using the available electronic resources. All Nephrology staff will be affected by the “morning huddle,” where all staff members come together to set a plan for the day. To further improve communication between the parallel operations within the UMNC, it is essential to appoint a director or operations manager whose purpose is to oversee all clinic operations and to ensure that all operations are working toward the same goal. It is not necessary to hire a new person to fulfil this role; it is more important to utilize available human resources and to enforce involvement from everyone in the clinic.

5.1 Activities

Within the first two weeks:

- Review the Rockwell phone analysis that was completed during the week of November 10. This will show why people are calling, what types of calls can be avoided, and how to reformat the calling system to best accommodate patient needs.
- Purchase pagers and begin using them to better accommodate patients waiting for labs.
- Find new location for the renal nurse to work, possibly in the corner of the MA section where he/she would not be bothered by passing traffic in the clinic.
- Hold a meeting with all staff to explain the suggested recommendations and the implementation plan. Also at this meeting promote use of the following resources:
 - Online problem summary list for each patient
 - Scriptwriter Writer program for prescriptions
 - Care Web for nurse notes
 - Lab Talk to automatically notify patients of lab results by phone
 - Pagers for patients waiting for labs in clinic

Within the first month:

- Begin integrating the renal and transplant call centers.
- Develop procedures for calling patients before their appointments.
- Develop new procedures for informing transplant patients of two separate appointment times: lab and seeing the physician.
- Develop days when certain types of appointments will be handled and procedures for scheduling to assure the goal.

Within six months:

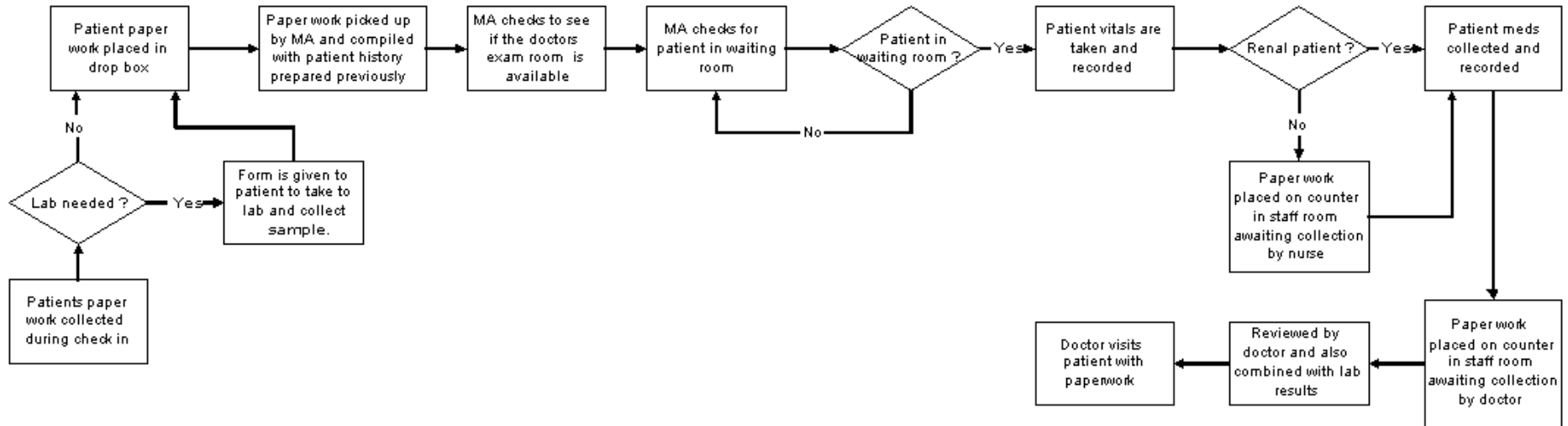
- Appoint or hire a medical director or operations manager to oversee operation.
- Fully integrate Renal and Transplant call centers.

5.2 Expected Results

After implementation, the clinic should expect to see the following benefits:

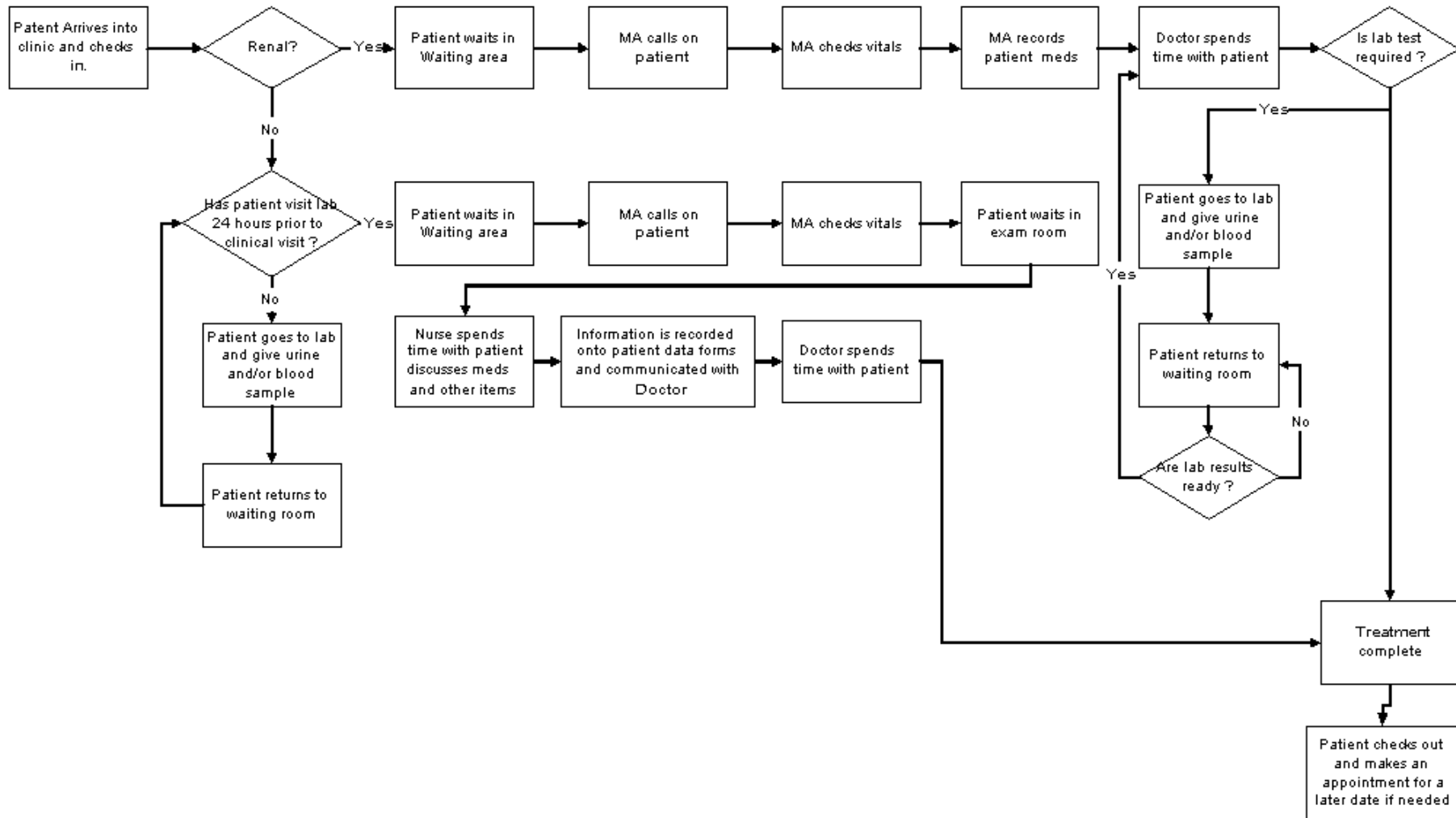
- Decrease number of days to the third available appointment
- Decrease cancellations, and more importantly, “no shows”
- Increase new patient to return visit ratio
- Increase physician productivity
- Increase continuity of care
- Increase patient satisfaction
- Increase overall clinic efficiency

Appendix A: Flowchart for Paperwork flow



* Flowchart represents the process that takes place 80% of the time

Appendix B: Flowchart for Patient flow



* Flowchart represents the process that takes place 80% of the time

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Objective	Pursuing a challenging Co-op/Internship position to expand experience in areas of interest including: Industrial and Operations Engineering, Financial engineering, Business Consulting, and Latin American Studies.	
Education	University of Michigan <i>B.S.E. in Industrial and Operations Engineering</i> Cumulative GPA: 3.2/4.0 <ul style="list-style-type: none"> • Modeling and Optimization Methods • Queuing Systems • Net Present Worth Analysis • Queuing Theory • Statistical Analysis: Taguchi Designs, Full and Fractional Factorial Experiments and Multivariate Regression 	Ann Arbor, MI April 2004
Experience	University of Michigan Minority Engineering Program Office <i>Tutor/Mentor</i> <ul style="list-style-type: none"> • Tutor all Engineering Pre-requisite Classes • Tutor all Industrial and Operations Engineering Classes 300 Level or Below • Help Organize and Structure Student Study Habits MCR Lumber Home Center <i>Operations Manager</i> <ul style="list-style-type: none"> • Expanded Territorial Sales by 60% • Designed and Optimized External Working Structure through Modeling • Implemented Ergonomics to the working structure and NIOSH guidelines • Designed Multifaceted Web Site Incorporating E-commerce Solutions • Trained Sales Personnel and Implemented New Marketing Plan Telenova Communications <i>Network Control Center Technician</i> <ul style="list-style-type: none"> • Controlled and changed Route Sets • Monitored Gateway Activity • Responsible for International Customer Service • Team Oriented Troubleshooting 	Ann Arbor, MI 2002 – Present Naranja, FL 1995-2002 Miami, FL Summer 2001
Language	Fluent In Spanish	
Computer Skills	Applications: Microsoft Office, Web Page Design (Flash and HTML), Microsoft Visual Basic, Ample, Maple, Microsoft Visual C++, Minitab, Mat Lab, and Code Warrior Languages: Visual Basic, C++, Flash and HTML Environments: Window 95/98/nt/ce/XP, MacOS, UNIX, Solaris	
Awards	Scholar Power Award Recipient	2002 & 2003
	Michigan Scholar Award	2000
Activities	International Association for the Exchange of Students for Technical Experience Executive Board	2002 – Present
	Michigan Engineering Consulting Club	2002 – Present
	Undergraduate Research Opportunity Program (Professor Nowak)	2000 – 2001
	Institute of Industrial Engineers (IIE)	2001 – Present
	University of Michigan Men's Volleyball	2000 – Present

Jamie L. von Behren

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Ann Arbor, MI 48104

OBJECTIVE To obtain a full-time position in which I can utilize my education and professional skills, work with others on an interpersonal level, and contribute to company growth. Willing to travel or relocate.

EDUCATION **UNIVERSITY OF MICHIGAN** Ann Arbor, Michigan
Industrial and Operations Engineering B.S.E Graduation Date: May 2004
GPA 3.18/4.0
Major GPA 3.4/4.0

Relevant Coursework:

Lean Manufacturing	Safety Occupational Management
Statistical Analysis	Economic Decision Making
Research Methods	Optimization Methods
Ergonomics	Materials Engineering
Facilities Planning	
Quality Control	
Operations Modeling	

PROFFESIONAL EXPERIENCE **LEAR CORPORATION** Auburn Hills, Michigan
Co-op Industrial Engineer May 2003-Present

- Redesigned plant layout, resulting in cost reduction and increased productivity
- Analyzed work operations and performed MOST time studies
- Improved ergonomics in the workplace by implementing changes in worker operations
- Updated the Standard Work Instructions for the build sequence of the 2004 model seating systems

UNIVERSITY OF MICHIGAN HOSPITALS SYSTEMS Ann Arbor, Michigan
Junior Engineer, Department of Program and Operations Analysis September 2003-Present

- Created a proposal to increase the efficiency of the Taubman Medical Center and improve patient satisfaction
- Performed time studies and work sampling to determine productivity of the physicians and medical staff
- Researched the billing, scheduling, and information systems at the medical center
- Provided recommendations to decrease patients' waiting times and reduce costs per patient for the medical center

VECTOR MARKETING Ann Arbor, Michigan
Senior Advisor of Sales and Marketing May 2002-April 2003

- Set and accomplished personal sales goal of \$15,000
- Trained over 25 sales representatives and recognized by becoming a Certified Field Trainer
- Organized and managed a sales team to set group and individual goals each week

BODY LANGUAGE FITNESS STUDIO Commerce, Michigan
Business Manager 1998-2002

- Oversaw workforce of a full-service yoga and fitness staff
- Produced a weekly schedule for over 60 employees
- Implemented business plan to increase new membership sales by 18%

ACTIVITES **INSTITUTE OF INDUSTRIAL ENGINEERS** September 2002-Present
Vice President of Activities

- Coordinated ways for IIE members to improve networking and work skills through professional and social events
- Organized workshops to advise students on their education and career paths

DELTA PHI EPSILON SORORITY 2000-Present

- Participated in philanthropy activities and fundraisers to raise money for Motts Children's Hospital
- Organized weekly study hours for the active members in the house

SOCIETY OF AUTOMOTIVE ENGINEERS January 2003-Present
Member

MICHIGAN ENGINEERING CONSULTING CLUB September 2003-Present
Member

AWARDS **LANDES AWARD** March 2001

- Excellence of a written technical report on "The Revision of Hip Replacement Surgery"
- Suggested ways to improve the hip replacement process through biomechanical analysis

UNIVERSITY OF MICHIGAN DEAN'S LIST Fall 2000, 2002

COMPUTER SKILLS

- Environments: Windows 95/98/nt, Macintosh, UNIX
- Applications: Microsoft Word, Excel, PowerPoint, MATLAB, MAPLE, AMPL, LayOpt, CAD
- Language: Visual Basic, C

LANGUAGE Working knowledge of Japanese

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OBJECTIVE	Seeking a challenging full time position that will utilize my educational and interpersonal skills. Willing to travel or relocate.	
EDUCATION	University Of Michigan <i>B.S.E. in Industrial and Operations Engineering</i> GPA: 3.3/4.0 Lean Manufacturing Production and Inventory Control Optimization Methods Operations Modeling	Ann Arbor, Michigan May 2004 Entrepreneurship Accounting Ergonomics Human Factors of Computer Systems Statistical Analysis Biological Anthropology Solid Mechanics Mechanical Properties of Materials
WORK EXPERIENCE	University of Michigan Hospital System <i>Junior Engineer, Department of Program and Operations Analysis</i> <ul style="list-style-type: none">Compared productivity in Nephrology clinic through time studies, and employee and patient dataInterpreted interview results from key project stakeholders to reach conclusions on methods of improvementResearched best demonstrated practices through a literature searchRecommended ways to improve the University of Michigan nephrology clinic based on data analysis Straits International Private Limited <i>Associate Consultant Intern</i> <ul style="list-style-type: none">Researched international markets in many significant industriesRecommended marketing strategies and business opportunities to several local companiesDeveloped business plans and presentations using Microsoft software for both internal and external useProjected client revenue increase of 25% for upcoming fiscal year and at least 20% in future years Outdoor Adventures <i>Student Manager and Trip Leader</i> <ul style="list-style-type: none">Organize and lead hiking, rock climbing, canoeing, and cross-country skiing trips for local participantsPrepare budgets of \$15,000 for the fiscal year 2002 pertaining to outdoor activities and wilderness medicineTrained new staff members through seminars on outdoor survival skillsDeveloped group registration and payment system, causing an increase in revenue of 10% Camp Thunderbird for Girls <i>Counselor and Trip Leader</i> <ul style="list-style-type: none">Collaborated with staff to develop an educationally and personally rewarding experience for a group of 17 teenage girlsPlanned logistics involved with a 6 week hiking expedition in the Pacific NorthwestLead the teenage group on their expedition, catering towards their unfamiliarity with the activities involved	Ann Arbor, Michigan <i>September 2003 - Present</i> Singapore, Singapore <i>May - August 2003</i> Ann Arbor, Michigan <i>September 2001 - Present</i> Bemidji, MN <i>Summers 1998 - 2002</i>
ACTIVITIES AND HONORS	Alpha Pi Mu (IOE Honor Society) <i>Initiate</i> <i>Executive VP</i> Marian Sarah Parker Scholars Program <i>Participant</i> Institute of Industrial Engineers (IIE) <i>VP Activities</i> Society of Women Engineers (SWE) <i>Member</i> Michigan Engineering Consulting Club (MECC) <i>Member</i> University of Michigan Dean's List	<i>September 2002 - May 2003</i> <i>May 2003 - Present</i> <i>October 2002 - Present</i> <i>May 2003 - Present</i> <i>September 2001-2003</i> <i>September 2003 - Present</i> <i>Fall 2001</i>
PERSONAL INTERESTS	Traveling, jogging, skiing, camping, and other outdoor activities	
COMPUTER SKILLS	Environments: Microsoft Windows, MacOS. Applications: Minitab, Microsoft Excel, Powerpoint, Word, Access. Languages: Microsoft Visual Basic	

YANIV COHEN

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- OBJECTIVES** To obtain a job that will complement my engineering and business skills and help me in my future career endeavors.
- EDUCATION** **University of Michigan - College of Engineering** Ann Arbor, MI
Industrial & Operations Engineering B.S.E, 2001 - 2004
- Degree GPA 3.48 / 4.00 scale
 - Overall GPA 3.30 / 4.00 scale
 - Fluent in the Hebrew Language
 - Lloyd Hall Scholar
- Courses Taken:
- | | | |
|----------------------|----------------------|-----------------------|
| Lean Manufacturing | Statistical Analysis | Corporate Finance |
| Accounting | Work Organizations | Engineering Economics |
| Optimization Methods | Ergonomics | |
- WORK EXPERIENCE** **University of Michigan Hospital Systems** Ann Arbor, MI
Junior Engineer - Department of Program and Operations Analysis, September 2003 - Present
- Study the efficiency of The University of Michigan Nephrology Department through flow charts, times studies and statistical data
 - Interpret interviews with key stakeholders and those involved with the treatment of patients to gain understanding of potential problems and find areas of improvement
 - Compare data found through literary searches and best practices done at other clinics
 - Make key recommendations based on finding to the Hospital on how they can improve their current system
- HSBC Bank, USA** New York, NY
Six Sigma - Quality Team, 2003
- Assistant to Master Black Belt Six Sigma team leader and project manager
 - Received both Six Sigma Green Belt Training and ABC Training
 - Mapped out the bank's entire Automated Clearing House (ACH) process in order to begin Six Sigma analysis and route out main bottle necks formerly hindering a potential \$8.2 million dollar growth throughout the next 5 years
 - Active team member who facilitated team meetings in which data was compiled and analyzed
- Six Sigma - Quality Team, 2002*
- Assistant to Six Sigma leader
 - Developed and analyzed data, then made recommendations based on Six Sigma tools and reorganized the process of internal insurance licensing
 - Exposed to numerous levels and departments throughout the bank due to diverse projects
- Ann Arbor Department of Transit** Ann Arbor, MI
Researcher, 2001
- Worked in a team to plan and fulfill research objectives
 - Conducted research for the Ann Arbor Department of Transit to improve student public transportation around campus
 - Correlated research done by other groups to produce a final recommendation in regards to a possible merger
- ACTIVITIES** **Pi Kappa Alpha Fraternity** Ann Arbor, MI
Active Member, 2000 - Present
- Selected as Membership Development Chairman - responsibilities include coordinating house speakers as well as educational workshops
 - Selected as Social Chairman - this involves organizing the fraternity's social calendar as well as taking care of inter-fraternal relations with other houses on campus
 - Participate in water polo and swimming fraternity competitions
- Community Service** Ann Arbor, MI
Participant, 2000 - Present
- Habitat for Humanity - Participated in on-site work and promotional activities
 - Greek Week - Elected by peers to represent and organize a 150-person house in a competition aimed at raising funds for the Camp Heartland Charity, the second largest charity event on campus
- Clubs**
- Participant*
- Member of Alpha Pi Mu - National Industrial Engineering Honor Society
 - Member of Institute of Industrial Engineers (IIE)
 - Member of Michigan Engineering Consulting Club (MECC)
- COMPUTER SKILLS**
- Operating System - Microsoft Windows, MacOS, Unix Systems
 - Applications - Microsoft Office Suites, Lotus Notes, iGrafX, Minitab, Adobe Photoshop, Adobe Publisher
 - Languages - C++, Visual Basic

