INTERNSHIP REPORT

Determining Requirements for a Practice Relevant Database for the Ophthalmology Clinic

at The Medical Centre

By

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Performed at

The Medical Center

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Acknowledgement & Endorsement

I would like to take this opportunity to thank Dr. Ghulam Farooq Dogar and this team for allowing me into their environment to complete this internship. I would also like to thank Debbie Hamilton, Don Woolridge and Andrew Patrick for their guidance and support during the internship period at the Medical Center.

This report has been written by me and has not received any previous academic credit at this or any other institution.

Athar Qureshi

Executive Summary

Rising hospital operational costs concomitant with ever increasing patient demands have put a considerable strain on the health economy. Improving fragmented patient flow processes, incorporating cost effective technological innovations and further refining the processes with understanding of technology benefits are among the various methods employed to provide safe and efficient patient care. These are challenging times for hospitals in terms of managing patient expectations and with reduced capabilities of addition in physical capacity out of the box problem solving is the need of the hour. One of the key management philosophy is managing healthcare information and the favorite tool is Electronic Medical Record (EMR).

The scope of the project revolved around The Medical Centre's Ophthalmology clinic to gather practice relevant requirements with the purpose of developing a database to track the patients' journey, thereby identifying areas of improvement in patient flow process and making it efficient. The database will help to analyze the current information flow, re-define workflow, centralize data information as well as re-organize organization structure to meet the changing needs of healthcare delivery process.

Building such a database has its challenges that transcend people, process and technology. These challenges call for a customized approach to problem solving and serve as a bridge between the organization and stakeholders requirements. The database will help in organizing the patient information which can be easily accessed by Dr. Dogar and other authorized members. The information extracted from the proposed database will be useful in areas of research, practice

review and analyzing the incidence of complications in comparison to peer group with similar facilities. The findings may be shared with General Medical Council in UK and Royal College of Physician and Surgeons in in Canada. The accuracy and completeness of the information contained in the database will not only benefit the medical clinic but also improve the wellness of the community of Grand Falls.

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Determining Requirements for a Practice Relevant Database for the Ophthalmology Clinic at

The Medical Centre

1. **Introduction**

Electronic Medical Record is defined as a digital version of a patient's paper chart (Tu et al.,

2015) It is a real-time, patient-centered record that makes information available instantly and

securely to the authorized users. A Patient's clinical encounters include among others, visit

documentation, vital signs such as blood pressure, weight, laboratory tests, prescriptions,

referrals, specialist consultation letters, etc and form a part of the cumulative patient profile.

(LAUa, F., Partridge, C., Randhawa, G., & Bowen, M. 2013)

In the present times, proper management of healthcare industry is the most debated topic in the

medical field currently. Among the many tools and process an efficient patient flow hinges on

the improved ability of the system. If the patient flow is smooth and well maintained, the service

capacity of healthcare will increase. It seems the system suffers from mis-coordination and lack

of control at the central level. For example, the patient's medical records are located at multiple

departments in various health facilities. Retrieval of medical record is impossible without

unnecessary paper work and documentation. Due to a variety of technical monitoring devices

and medical equipment at various locations, it is hard to get a clear picture of medical history.

The issues of missing links in information, lack of proper decision making at the clinical level

and absence of a unified data base with patient's medical information hampers delivery of

smooth, safe and efficient healthcare service. (Ford, Menachemi, & Phillips, 2006; Vezyridis, Timmons, & Wharrad, 2011)

2. Description of the Organization

The Medical Centre in Grand Falls Windsor is a prestigious healthcare provider located in Newfoundland. It provides high quality healthcare services to the women, children, youth and families who are primarily the residents of Grand Falls, Gander, Bager & Appleton. Dr. Dogar's Ophthalmology clinic is based within The Medical Center, and caters to the eye care needs of the above mentioned population. Apart from the above it also accepts patients from other communities within the Maritimes. Typically, about 120 -130 patients are seen in the clinic every week. All the referrals are reviewed by the ophthalmologist after being prioritized according to severity of the condition and level of urgency for the need of intervention by the ophthalmologist. The clinic, as in rest of the country, is also plagued with long waiting times, typically around 3-4 months for the first visit. Urgent referrals are however seen within 24 -48 hours. Eye examination is done in the Clinic and patients are scheduled for surgical intervention if they require so. Most procedures do not require admission to the hospital and patients are discharged home after few hours of observation with follow-up scheduled in the Clinic.

3. Description of the Project

In order to improve the efficiency and quality of healthcare delivery the ophthalmology outpatient clinic is currently reviewing its healthcare delivery process. The primary focus is improvements in patient workflow and patient safety. The author was hired as a Health

Informatics intern to gather requirements about the proposed database with an aim of collecting and analyzing the practice relevant data at the ophthalmology clinic. Figure 1 is the transcript received by the author at the beginning of the work placement.

The objectives of the project are to:

- Identify the stakeholders.

- Interview the stakeholders and to identify their needs

- Collect information from relevant documents,

- Understand the workflow of the clinic both management and patient workflow

- Identify the challenges and solutions in constructing the database

> **THE MEDICAL CENTRE**
> *-Ophthalmology Clinic*
> *Masters Student Placement*
> *Summary- May7, 2015*
> *Dr. G.F DOGAR, MD, FRSC, MBBS*
>
> **General Description of the Project;**
> *Prepare a system of data base that allows collection of practice relevant data and has the capacity to help analyze the practice stats and yield information on varied keys factors. It should be diverse enough to not only help data mining of the yester years practice/surgical stats but also enable data input and analysis in future.*
> **Description of Student Task;**
> *The student will collect information about what is needed, elicit the user requirements and design a relational data base that will meet the needs of the concerned stakeholders.*

Figure 1: Description of Student Placement

The proposed database will facilitate not only the collection of practice relevant data but would also have the capacity to help analyze the practice statistics thereby, yielding actionable information on varied keys factors. Dr. Dogar was also of the opinion that "it should be diverse enough to not only help data mining of the yester years practice/surgical statistics but also enable data input and analysis in future".
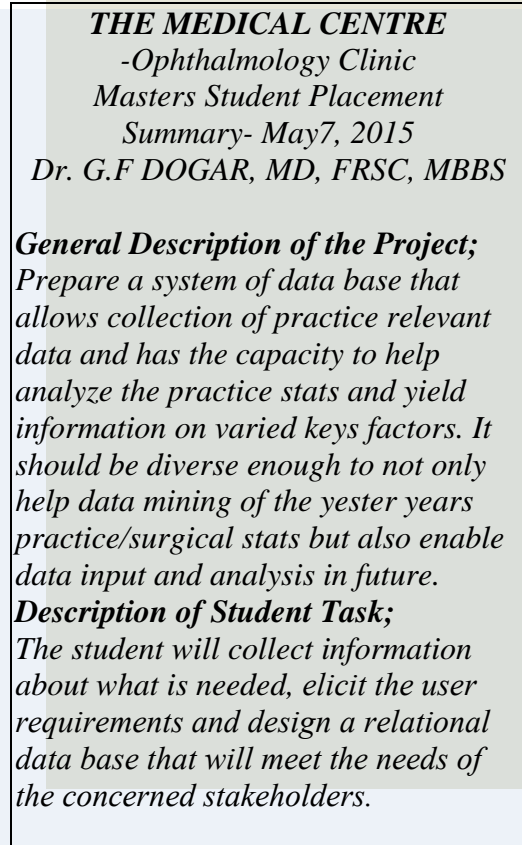
4. **Description of the work performed at The Medical Centre**

To meet the intended objectives it was apparent that a thorough understanding of the patient flow in Ophthalmology clinic be understood. The author set upon the path with the following aims:

- To understand the whole patient journey and effectively map the process from entry to exit.

- To understand the communication needs and the flow of information between all the stakeholders.

Given the above mentioned unique needs of the employer, the author intended to understand the user requirements and to translate them into relevant health informatics paradigm using various steps as learnt in different courses in Health informatics program and with reference to the BABOK v2 guide (Brennan & International Institute of Business Analysis, 2009) The primary intent was to focus on the following:

- Stakeholder analysis

- Map Patient and Information Flow

- Elicitation requirements

- Requirements determination

- Conceptual Modeling

4.1 Stakeholder Analysis

The Ophthalmology clinic has been operational for more than two decades and patient information is scattered all over the system, mostly on paper charts. Some of the information was also documented in excel and word files in the Dr. Dogar's computer in his office. The chief stakeholder, Dr. Dogar wants to arrange all the information at one place and in one format for

quick and easy retrieval in future. From the various meetings and interactions with Dr. Dogar, the author is convinced about the stakeholder commitment in terms of time, money and effort. Additionally, it has been found that he is the most influential person on the team with exclusive powers to take decisions.

Stakeholder	Roles/ Responsibilities
Director / Ophthalmologist	• **Head of the Medical Center** • **Attending Ophthalmologist / physician**
Registration Clerk	• **Communication -internal & external** • **Record keeping** • **Schedule appointments**
Ophthalmology Assistant	• **Preliminary examination** • **History taking** • **Pre-clinical work up**

Table 1: Stakeholder Roles and Responsibilities

The author's goal is to gather the information not only from the patient's charts but also from the documents used by other stakeholders who are dealing with the information on daily basis like the registration clerk and ophthalmology assistant. These stakeholders are responsible for data input as the patient enters their workflow areas during the healthcare journey. The author found these stakeholders to be motivated for a change for the better and provided useful and constructive input to the chief stakeholder. In general there was a good communication plan between the stakeholders and there was a daily staff huddle in the morning at 8 am wherein the day's work was reviewed and minor issues solved. More serious issues were delayed for dedicated staff meetings.

4.2 Patient and Information flow

To help the reader understand the workflow around patient journey, a very high level
macroscopic view of the process is exhibited via Business Process Modeling and Notation.
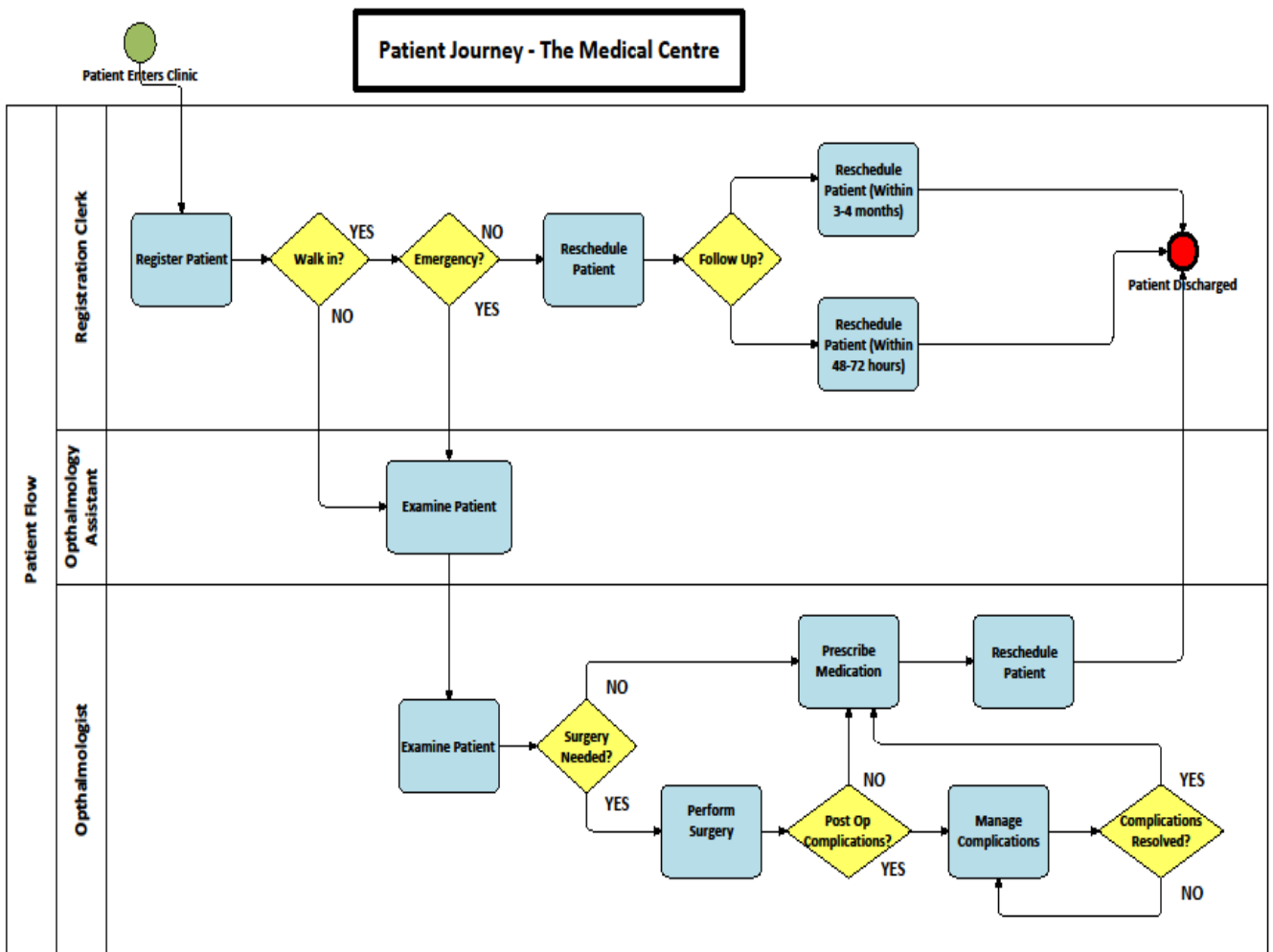(BPMN diagram) in Figure 2.

Figure 2: BPMN Diagram

The patient's healthcare journey in this clinic begins with the patient reporting to the clinic .The patient could be a walk-in or a pre appointed one and the registration clerk makes that distinction. While registering the patient he enters the patient demographics, and, based on the acuity of the patient's condition, a decision is made if the patient requires an emergency management or not. In case emergency management is needed, the patient is instructed to wait in the waiting area and as soon as possible,

Patient Wait Time by Priority	
Emergency	Seen same day
Follow Up	Seen within 48-72 hours
Routine	Seen within 3-4 months

Table 2: Time Schedule Based on Priority

examined by the ophthalmology assistant; else he or she is rescheduled. The appointment times vary from 48-72 hours for a follow up patient to within 3-4 months for non-emergent and non-follow up patients. Once the ophthalmology assistant is available, the patient is escorted to the examination room by the ophthalmology assistant. The examination includes asking about the chief complaint, taking brief history, with intent of preparing the patient to be checked by the ophthalmologist.

The next step in the patient journey is examination by the ophthalmologist. The ophthalmologist decides about the surgery type or procedure. If a surgery is needed, it is performed or else the patient is prescribed medications and rescheduled for a follow up. One of the crucial things after performing the surgery is to keep a close eye on the post operation complications. In case these complications surface, they are promptly managed and the patient is prescribed appropriate medication. This patient is then rescheduled for a follow up visit and discharged with follow up instructions. In case the patient is fortunate enough to have no post-

operative complications, he is prescribed appropriate medications and discharged after being rescheduled as a follow up patient.

4.3 Elicitation Requirements

Elicitation requirements are one of the key steps in the process for development of a database. It is highly dependent on the knowledge of the stakeholders, their willingness to participate in defining requirements, and the group's ability to reach consensus. One of the most challenging aspects of this step is that most of the requirements essentially remain in the minds of the stakeholders and are never documented anywhere. This project was no different. The chief stakeholder is an Ophthalmologist and has certain ideas in his mind based on his perceived needs. Hence these ideas must be elicited out of his mind as well as those of other stakeholders in a logical methodology. This will help in narrowing down the scope of the project as well as controlling the scope creep as the author is fully aware that healthcare is a constantly changing environment.

Based on the concepts of the Health Informatics courses the following principles were used: Application domain understanding- This principle was used to understand the general work area where the proposed database is to be used.

Problem understanding- This principle was used to understand the work flow as well as the problems encountered by the stakeholders.

• Business understanding- understand how systems interact and contribute to overall business goals.
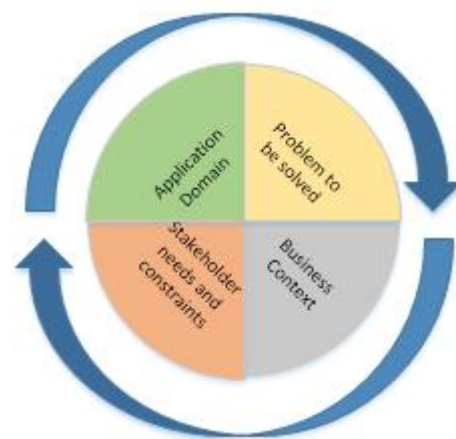
• Understanding the needs and constraints of system

Figure 3: Tenets of Elicitation Requirement

stakeholders- understand, in detail, the specific needs of people who require system support in their work.

After identifying the right stakeholders, the author used the following elicitation techniques to elicit requirements:

• Brainstorming

• Document analysis

• Interviews

• Observation (job shadowing)

Brainstorming is a group creativity technique by which efforts are made to find a conclusion for a specific problem by gathering a list of ideas spontaneously contributed by its members. The term was popularized by Alex Faickney Osborn in the 1953 book Applied Imagination (Osborn, 1963). The stakeholders regularly huddle at 8am in the morning to discuss about the day's work. The author utilized this operational opportunity within the Medical Centre to get himself oriented to the workflow of the clinic. It is during these sessions that issues and challenges are discussed by the employees and minor problems are addressed on the spot. Major issues are escalated to a more dedicated meeting time for problem solving. Apart from this the author also scheduled one on one interviews with all concerned to understand the needs and requirements of the involved stakeholders.

During these sessions several documents were shared with the author. These have been and still are the only source of data input and information flow within the clinic. The significance of these documents must be understood within the historical workflow processes and must be interpreted accordingly. Though it is tempting to dive right in and begin building the database, the author realized very early that any worthwhile endeavor will begin with a thorough planning and

understanding of the necessary documents used within the clinic. Some of the documents that the

author utilized included: Admission form, Short stay record, Consent form, and Discharge form.

The combined results of all the above elicitation techniques provided an input source to build the

logical model, for the proposed database and led to better understanding of the following:

- The information that needs to be recorded for smooth workflow

- The clinic goals/objectives that need to be supported by the proposed database, and

- Whether a requirement should be included or not and be useful for future planning.

4.4 Requirement Determination

The main purpose of this phase is to establish a common understanding of the business

requirements with the concerned stakeholders. Business requirements can be loosely defined as

statements that describe what the stakeholders need and want. Based on the above the

stakeholder requirements are as follows:

- Ability to track patient information as he moves in his healthcare journey, number of

visits to the clinic, cancellations, how many days stayed in the hospital, expected number of days

after surgery, frequency of visits, routine checkup, and follow-ups

- Ability to record the number of minor procedures, intraocular lens procedures, type of

surgeries, type of lens used and the complications the patient has encountered.

- Ability to assess the complication rate in different age groups, gender variance,

comorbidities, systemic /ocular and type of anesthesia

- Ability to assess the severity of the surgery and its progress

- Ability to predict complications (if they exist) in certain subset of patients

- Ability to assess if there is an unexpected recurring complication.

- Ability to assess any healing time variance in different subsets of patients.

- Use the data to improve standard of care.

- Identify any factors that can enhance surgical efficiency.

4.4.1 User Group List

Based on the understanding of the requirements, following users (Table 3) with their associated tasks and information needs were identified.

S No.	USER	TASKS	REPORTS
1	Registration Clerk	- Handle inquires and patient intake - Maintain daily schedules - Ensure all records are properly filed - Enter and verify patient demographic info and billing info - Direct patient to the waiting area - Obtain signed statements - Help patient with completing medical forms - Answer phone calls - Updating Cancellation - Follow up reminder calls - Contact ophthalmology assistant and ophthalmologist about meetings / patient updates - Ensure all files are secure	- Number of patient checked in per day - Patient cancellations / reschedules - Emergency patients seen within 24 hours - Follow up patients to be seen with 48-72 hours - Patients scheduled to be seen with 3-4 month period time - Patients referred to other physicians
2	Ophthalmology Assistant	- Organize and manage patient info data - Preliminary examination - Medical / Eye surgery history intake - Prepare patient (dilate pupil) - Test patient eye for scope of vision , pressure, pupil reactions - Check visual acuity - Encounter in time - Encounter out time - Inform Ophthalmologist about patient chief complaints / patient is ready - Provide further instructions before the patient leaves the clinic	- Patient cancellations / reschedules - Patient complications - Updating medical/ surgical history - Time spent on each patient visit

| 3 | Ophthalmologist | **CLINICAL**
• **Head of the Medical Center**
• **Attending Ophthalmologist / physician**
• **Assessing and examining patients in order to make a diagnosis**
• **Perform surgical procedures using an operating microscope, small incision (keyhole) surgery, laser surgery**
• **Management of medical disorders affecting vision: vascular, inflammatory, neurological and genetic disorders,**
• **Collaborate with other specialists for patient referral**
• **Patient education to understand the severity of the medical condition**
MANAGERIAL
• **Oversee billing**
• **Order medical and office supplies**
• **Supervise, hire , train staff**
• **Delegate responsibilities**
• **Assess employee performance**
• **Generate inventory reports**
• **Formulate objective and processes** | **CLINICAL**
• **How many patients seen**
• **How many no show appointment cancelled**
• **How many surgeries / procedure done**
• **How many procedures done (Glaucoma , Cataract, Selective Laser Trabeculoplasty etc)**
• **Surgery / Procedure complications**
• **Other systemic complications**
MANAGERIAL

• **Revenue and expenses report**
• **Staff Scheduling**
• **Vacation planning**
• **Inventory and supplies status**
• **Payroll** |

Table 3: Users Tasks and Reports

4.5 Conceptual Modeling

The conceptual model of the database known as Entity Relationship Diagram (ERD) (Shoval, Danoch, & Balabam, 2004; Choi, Kim, & Tuan Hung, 2012) is shown in the figure 4. This model explains the relationship between the different entities. The Administrative table hold the information about the Ophthalmologist and other staff members in the clinic, an ophthalmologist consults many patients whose information resides in the Demographic table. Each patient can have multiple examinations, diagnosis, treatment and medications pertaining to the medical and surgical chief complain. Depending upon the treatment (surgical / procedures) each patient can have multiple complications that are treated accordingly. The information about patient's encounter is recorded in the Discharge table where encounter in time and encounter out time indicates patient's coming in the clinic and leaving the clinic respectively. The physical entity relationship diagram of the conceptual model is included in appendix C (Hernandez, 2013).
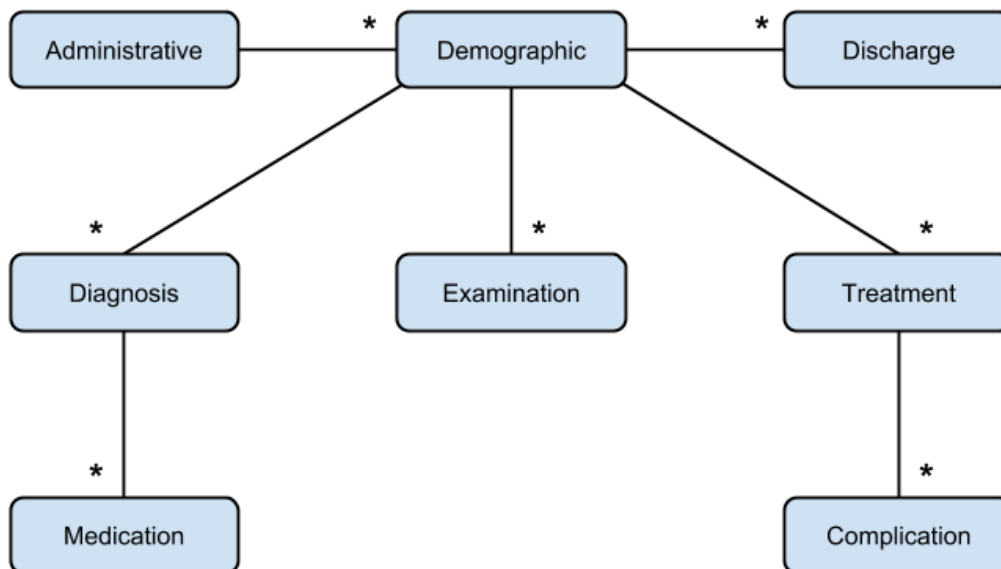
Figure 4: Conceptual ERD diagram

* 1- Many relationship

5. Relationship to Health Informatics

The skills required to determine requirements for the ophthalmology clinic is based on knowledge acquired through academic coursework in MHI program. The author's work which was mainly based on HINF 6110 (Health Information Systems and Issues) involved gathering requirements to build a database by understanding and analyzing the needs of the various users at the clinic. Understanding the communication needs and the flow of information between the stakeholders and organization were built upon the HINF 6101 (Health Information Flow and Use). The lesson and different techniques learnt in HINF 6220 (Networks and Web for HI) gave a deep insight to design and plan the hierarchical referential integrity of the database. The data flow diagram and BPMN diagram were designed for easy identification of the tasks associated with a process during the patient journey at the clinic were learnt from the HINF 6102 (Health information Flow and Standards). IT Project Management HINF 6300, knowledge helped to divide the whole project according to the work breakdown structure, prioritize tasks and to utilize the resources and time wisely.

Hence the various courses of the MHI program allowed the author to incorporate his knowledge in the various steps of the internship.

6. Conclusion

The author's internship at the Medical Center provided a valuable opportunity to work in a real healthcare environment and gain valuable experience. This allowed him to apply his MHI knowledge and meet the objectives of the internship.

The author was able to fulfill the tasks of determining requirements and documenting information for effective coordination at the clinic. The author formulated the gathered requirements as conceptual and logical entity relationship diagrams. This proposed conceptual and logical model is intended to be used by the development team to build actual information system. The proposed database will facilitate not only the collection of practice relevant data but would also have the capacity to help analyze the practice statistics. The information system will improve the standard of care at the clinic and help tracks patient's cumulative information along the treatment journey. The information system is also designed to track complications arising from different treatment regiments in different age group and gender.

7. Recommendations

This is work in progress and is focused on determining and engineering requirements of an information system at the Medical Center. The author of this report has the following recommendations:

- Process the determined requirements and partner with database development team to either build or buy the finished product. Some of the important factors to be considered in making this decision would be cost of the product and available resources to maintain it

- Once the product is ready, the author recommends to do a pilot testing for a period of at least 3 months to check the operational efficiency of the database. Within this period the system can be fine tuned for optimal performance

- The success of this system also lies in the optimal and appropriate use of this system. This will require extensive training of the staff and the ready availability of the guiding resources for the same. This component should be a part of the negotiations with the development team before handing the contract

- No system can run indefinitely without maintenance, bug fixes and updates and modifications made to it. A clear maintenance schedule along with allocating responsibility for the same would meet to be discussed and implemented as part of the final contract.

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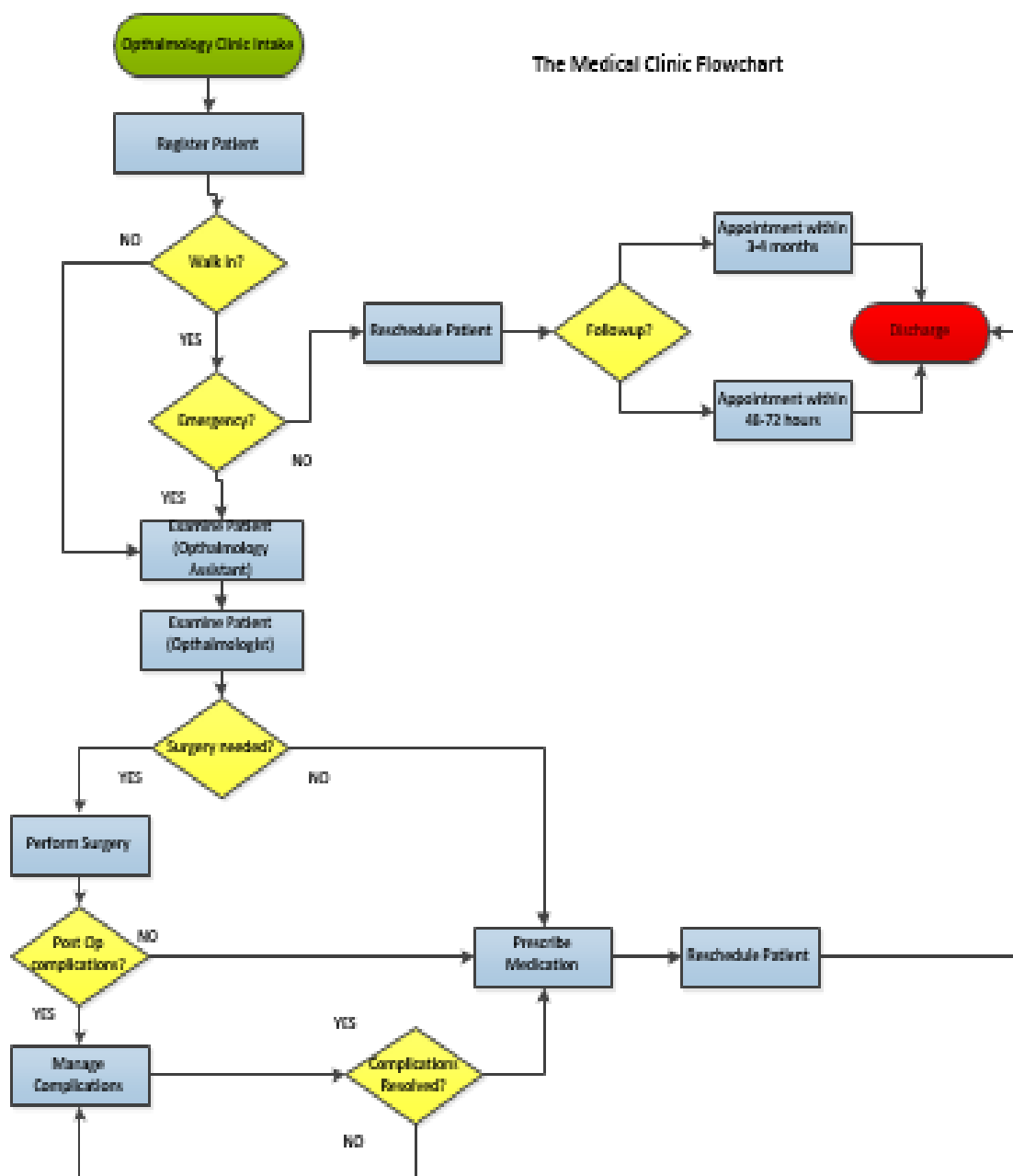
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9. Appendix
A. Patient Flow Chart

The Medical Clinic Flowchart

B. Physical ERD

Administrative Table

Adinistrative ID (PK)
Attending Physician(Ophthalmologist)
Ophthalmology Assistant
Admission Date
Admission Time
Mode of Arrival
Patient Preferred Admission Date
Date Appointment
Date Referral Received
Surgery Date
Date of Patient Contacted
Pre Admission Testing
Consent Taken

Demographic Table

Patient Chart # (PK)
Patient Last Name
Patient First Name
Patient MCP #
Patient Age
Patient Gender
Patient Date of Birth
Patient Address
Patient Telephone
Religion
Patient Allergies
Next of Kin Name
Next of Kin Address
Next of Kin Telephone
Next of Kin Relationship
Administrative ID (FK)

Treatment Table

Treatment ID (PK)
Surgery Type
Local Anesthesia Required
ICU Required
Admit # of Days Pre-Op
Expected Length of Stay
Procedure
Plan (Right Eye / Left Eye)
Discharge Date
Additional Procedures
Premium IOL
Patient Chart # (FK)

Discharge Table

Discharge Date
Encounter In Time
Encounter Out Time
Follow-up
Disposition on Discharge
Family / Referring Physician
Patient Chart # (FK)

Examination Table

Examination ID (PK)
Vital signs
History of Present Illness
Past Medical History
Past Surgical History
Systemic Review
Physical Exam
Medical Condition
Patient Chart # (FK)

Diagnosis Table

Diagnosis ID (PK)
Most Responsible Diagnosis
Comorbid Condition
Other Primary Diagnosis
Secondary Conditions
Patient Chart # (FK)

Medication Table

Medication ID (PK)
Current Medications
Home Medications
Diagnosis ID (FK)

Complication Table

Complication ID (PK)
Systemic Risk Factors
Ocular Risk Factors
Complications
Management
Treatment ID (FK)

C. Data Elements Table

Administrative Table	
Administrative ID (primary Key)	A key in a relational database that is unique for each record.
Attending Physician (Ophthalmologist)	Ophthalmology doctor who performs the procedure/surgery
Ophthalmology Assistant	Staff who does the preliminary evaluation and prepare the patient to be examined by the Ophthalmologist
Admission Date	The date when the patient was admitted for the routine checkup, follow-up, procedure / surgery
Admission Time	The time when the patient is admitted for the routine checkup, follow-up, procedure / surgery
Mode of Arrival	Emergency, Within 48 – 72 hours , Within 3- 4 monhts
Patient Preferred Admission Date	The date which suits the patient for the routine checkup, follow-up, procedure / surgery
Date Appointment	The date when the patient was admitted for the routine checkup, follow-up, procedure / surgery
Date Referral Received	The date of referral received from other physicians
Surgery Date	The date of surgery / procedure to be performed
Date of Patient Contacted	The date when the patient was contacted for the routine checkup, follow-up, procedure / surgery
Pre Admission Testing	The lab tests and other investigations done prior to the procedure/surgery
Consent Taken	Written consent taken by the patient or another person who can give the consent on the behalf of the patient in certain cases

Patient Chart # (Foreign Key)	A foreign key is a field (or collection of fields) in one table that uniquely identifies a row of another table (Patient Chart #)
Demographic Table	
The Patient Chart # (Primary key)	A key in a relational database that is unique for each record.
Patient Last Name	Patient last name (surname or family name)
Patient First Name	Patient first name (person's name)
MCP #	Medical Care Plan #
Age	Age
Gender	Male , Female , Others
Patient Date of Birth	Month- Day- Year
Address	Address of the patient where the patient can be reached
Patient Telephone #	Home Number , Cell Number , Work Number
Religion	Religion, Others
Patient Allergies	Known patient allergies to medicines / Food
Patient NOK (next to KIN) Name	Patient's closest living blood relative or relatives (name)
Patient NOK Address	Patient's closest living blood relative or relatives (address)
Patient NOK Telephone #	Patient's closest living blood relative or relatives (Telephone)
Patient NOK relationship	Patient's closest living blood relative or relatives (relationship)
Administrative ID (Foreign Key)	a foreign key is a field (or collection of fields) in one table that uniquely identifies a row of another table(Administrative ID)

Examination Table	
Examination ID (Primary key)	A key in a relational database that is unique for each record.
Preliminary Exam	Clinical assessment that indicate the state of a patient
History of Present Illness	Obtaining an accurate history is the critical first step in determining the etiology of a patient's problem
Past Medical History	The patient health status prior to the presenting health problem
Past Surgical History	Patient ever had any kind of surgery performed before
Systemic Review	Review of the different systems of the body : Cardiovascular system, Respiratory System, Renal System, Gastrointestinal System, Ocular System etc.
Physical Exam	Clinical examination of the patient including Pulse, blood pressure, heart rate check. Vision checkup and a complete eye examination.
Medical Condition	Medical status/other diseases like Diabetes, Hypertension, Renal failure, which can hinder the surgical procedure
Diagnosis Table	
Diagnosis ID (Primary Key)	A key in a relational database that is unique for each record.
Most Responsible Diagnosis	The condition that was most responsible for the hospitalization
Comorbid Condition	Having one or more additional medical disorders
Other Primary Diagnosis	Besides the main diagnosis , condition, procedure or surgery the patient is being treated for
Secondary Conditions	Secondary diagnosis / conditions are the other things the patient may have ; and they may or may not contribute to the Primary diagnosis

Patient Chart # (Foreign Key)	A foreign key is a field (or collection of fields) in one table that uniquely identifies a row of another table(Patient Chart # ID)
Medication ID (Foreign Key)	A foreign key is a field (or collection of fields) in one table that uniquely identifies a row of another table(Medication ID)
Complication ID (Foreign Key)	A foreign key is a field (or collection of fields) in one table that uniquely identifies a row of another table(Complication ID)
Treatment Table	
Treatment ID (Primary Key)	A key in a relational database that is unique for each record.
Surgery Type	Different type of laser eye surgery to reshape the cornea include LASIK, wavefront-guided LASIK. PRK and LASEK.
Local Anesthesia Required	Whether the surgery / procedure needs local anesthesia
ICU Required	whether the patient requires Intensive Care Unit care after the surgery /procedure
Admit number of Days Pre-Op	How many # of days admitted before the surgery
Expected Length of Stay	ELOS he length of time an individual is expected to stay in hospital, based on the patient's age, most current acute length of stay, condition and diagnosis of the patient
Procedure	Series of actions conducted in a certain way or order : an established or accepted way of doing something / a medical treatment or operation
Plan (Right Eye / Left Eye)	Make a plan to conduct surgery/ procedure on (Right Eye / Left Eye)
Discharge Date	The official date of release of the patient from the hospital / clinic
Additional Procedures	Besides the main eye surgery, other surgery done

Premium IOL	Eye procedure: Intra-ocular cataract surgery give you the best possible vision. With premium IOL's many people never need glasses after cataract surgery, or only wear them occasionally
The Patient Chart # (Foreign key)	A foreign key is a field (or collection of fields) in one table that uniquely identifies a row of another table (Patient Chart #)
Medication Table	
Medication ID (Primary Key)	A key in a relational database that is unique for each record.
Current Medications	The medications the patient is taking at present (hospital or clinic stay)
Home Medications	The medications the patient is taking regularly at home
Diagnosis ID (Foreign Key)	A foreign key is a field (or collection of fields) in one table that uniquely identifies a row of another table (Diagnosis ID)
Discharge Table	
Discharge ID (Primary Key)	A key in a relational database that is unique for each record.
Discharge Date	The official date of release of the patient from the hospital/ clinic
Encounter in time	Time the patient enter the clinic checkup / follow up etc.
Encounter out time	Time the patient leaves the clinic (discharge) with further instructions
Follow-up	Further observation or treatment of a patient, especially to monitor earlier treatment. The date and time given by the physician for re-visit for future instructions
Disposition on Discharge	The final place or setting to which the patient was discharged on the day of discharge. (Home, hospice, acute care facility, expired, left without medical advice)
Family / Referring Physician	Referred to the family physician or other medical care

The Patient Chart # (Foreign key)	A foreign key is a field (or collection of fields) in one table that uniquely identifies a row of another table(Patient Chart #)
Complications Table	
Complication ID (Primary Key)	A key in a relational database that is unique for each record.
Systemic Risk Factors	Factors associated with the Cardiovascular system, Respiratory System, Renal System, Gastrointestinal System, Ocular System etc.
Ocular Risk Factors	Factors associated with the ocular surgeries and procedures
Complications	Potential problems occurring after the ocular surgeries and procedures
Management	Organization dealing with planning, controlling, leading and coordinating specific tasks to achieve the organization goals
Treatment ID (Foreign Key)	A foreign key is a field (or collection of fields) in one table that uniquely identifies a row of another table(Treatment ID)

D. Medical Forms
Medical Form A

ADMISSION AND/OR OPERATION ROOM BOOKING FORM

Priority:	
Urgent	[ ]
Semi-Urgent	[ ]
Elective	[ ]

To avoid errors, please print or type.

Chart #:	MCP #:	Other:

Last Name	Given Name	Initial	Religion:

Street/P.O. Box	Town	Postal Code	Telephone #:

DOB (mm/dd/yy)	Allergies: N/A [ ] LATEX [ ] OTHER _____

NOK:

Name	Address	Relationship	Phone #

Surgery Type: Inpatient [ ] PAC [ ] Day Surgery [ ] SDA [ ]	Local Anaesthetic Required: Yes [ ] No [ ]

Admit # Days Pre-Op	Expected Length of Stay	Patient Will Require: ICU [ ]

Attending Physician:

Most Responsible Diagnosis:

Procedure(s):

Comorbid Condition(s):

Infected:	Yes [ ] No [ ]	Diabetic:	Yes [ ] No [ ]
Portable X-Ray:	Yes [ ] No [ ]	Image Intensifier:	Yes [ ] No [ ]
Lab Investigation Requested	Yes [ ] No [ ]	Discharge Planning Required	Yes [ ] No [ ]
Community Health Referral Required:	Yes [ ] No [ ]		

Special Equipment and Other Considerations: _____

Comment: _____

Please use the following date format: Day/Month/Year - Shaded Areas for Booking Office Use Only

Date Referral Received	Date Appointment	Surgery Date	Date Patient Contacted
Pre-Admission Testing	Admission Date	Patients Preferred Admission Date	

Date Referral Completed _____   Doctor's Signature _____

Medical Form B

HISTORY & EXAMINATION FORM   PATIENT NAME:

AND   MCP#:

SHORT STAY RECORD

Vital Signs: T _____ P _____ R _____ B/P _____

Allergies _____

History of Present Illness _____
_____
_____

Past Medical Hx

Past Surgical HX

Asthma	Yes ☐	No ☐	
Diabetes	Yes ☐	No ☐	
Heart Ds	Yes ☐	No ☐	
Renal Ds	Yes ☐	No ☐	
Hypertension	Yes ☐	No ☐	
Other	Yes ☐	No ☐	

Current Medication _____

System Review	Normal	Abnormal	**Details of Positive Systems**
CNS	☐	☐	
CVS	☐	☐	
RESP	☐	☐	
GI	☐	☐	
Bleeding	☐	☐	
Other	☐	☐	

Physical Examination	Normal	Abnormal	**Details of Positive Systems**
Head and Neck	☐	☐	
Chests	☐	☐	
CVS	☐	☐	
Abdomen	☐	☐	
CNS	☐	☐	
Lymphatic	☐	☐	

Informed consent has been obtained which includes discussion on risks, benefits, and alternatives.

Diagnosis: _____   Signature _____

Plan: _____   Date: _____

Medical Form C page1

CONSENT TO INTERVENTION

This consent is valid for 60 days from the date this form is signed.

1. I, _____ , consent to the following intervention
   (Myself/Care Giver)

   _____ , for
   (Intervention)

   _____ ordered by or to be performed by
   (Myself/Other)

   _____ .
   (Person Performing Procedure)

2. The nature, purpose and consequences of what is proposed, including significant
   risks, and alternatives available have been explained to me by

   _____ . I am satisfied with these explanations and I
   (Person Performing Procedure)

   have understood them. I understand the risks of receiving no intervention.

3. I also consent to such additional or alternative investigations, treatments or
   operative procedures as in the opinion of _____
   (Person Performing Procedure)

   are immediately necessary.

4. I further agree that in his or her discretion, _____
   (Person Performing Procedure)
   may have other physicians, surgeons, professionals in training, and/or health
   care providers assist with all or part of the investigation, treatment, or operative
   procedure.

5. I understand that this intervention may include anesthetic, and that the nature of
   any anesthetic required will be explained to me.

6. I consent to the disposal of tissue and parts removed at operation according to the
   approved practice of the hospital.

Medical Form C page2

7. I agree that the relationship between patient and health care provider shall be governed by the laws of the Province of Newfoundland and Labrador and that only the Courts of the Province of Newfoundland and Labrador shall have jurisdiction to entertain any complaint, demand, claim or cause of action arising out of the treatment.

_____   _____
Signature of Patient   Day/Month/Year

_____   _____
Person Signing on Behalf of Patient   Time

_____
Relationship to Patient

_____
Witness

Consent to Intervention via Telephone:

1. Reason for obtaining consent by telephone

_____

2. Name of person (and position) verifying that explanation of risks and benefits

    were given: _____

3. Telephone Number called: _____

4. Name of consenting party _____

    Relationship to Patient _____

_____   _____
Day/Month/Year   Time

_____   _____
Signature of Person Obtaining Consent   Signature of Witness (Health Care Professional)