McMaster eBusiness Research Centre

Springfield Public Health: EMR Initiative

By

Umama Ahmed, Mysoon Alam, Sinu Jackson, Shivani Sookar,
Emina Topcagic and Nicole Yada

McMaster eBusiness Research Centre (MeRC)

WORKING PAPER No. 55
April 2016

SPRINGFIELD PUBLIC HEALTH: EMR INITIATIVE

By

Umama Ahmed, Mysoon Alam, Sinu Jackson, Shivani Sookar, Emina Topcagic and Nicole Yada

MeRC Working Paper # 55

April 2016

DeGroote School of Business

McMaster University

Hamilton, Ontario, L8S 4M4

Canada

archer@mcmaster.ca

SPRINGFIELD PUBLIC HEALTH: EMR INITIATIVE

Students Umama Ahmed, Mysoon Alam, Sinu Jackson, Shivani Sookar, Emina Topcagic and Nicole Yada wrote this case under the supervision of Professor Joseph Tan. The contents within were written based on interviews conducted in the months of October and November, 2015. Names of individuals, locations, companies and products have been disguised to protect confidentiality.

INTRODUCTION

It was a cold day in February 2011 and Danielle Williams sat in her office and let out a long sigh. There was a recent spike in sexually transmitted infections, specifically gonorrhoea and chlamydia, and the city was struggling to track the population and produce surveillance reports. Springfield Public Health was currently using a paper-based reporting system and Danielle wondered how she could improve the organization's efficiency and reporting. Danielle submitted a Request for Proposal (RFP) to technical implementation consultants and change management consultancy firms. She hired a team of consultants from JT Consulting to help her through this project. JT Consulting would help diffuse many of the human and technical issues Danielle was facing. She hoped to have a system in place that would help physicians and nurses track and record patient records for better analysis, surveillance and efficiency. The goal was to have all departments in Springfield Public Health connected on the same platform to allow for greater interoperability.

Background of Springfield Public Health

Public health involves health promotion, disease prevention, prolonging life and improving quality of health on a population level. At Springfield Public Health, the focus is on bed bugs, restaurant inspections, prenatal care, sexual health, injury prevention, dental clinics, surveillance, program evaluation, immunization, head lice, health promotion, infectious disease, West Nile virus, nutrition and mental health.

In October 2009, Springfield Public Health relocated to a new site, in Downtown Springfield. With this newer building, they had the IT infrastructure to start thinking about new ways to incorporate technology into their day-to-day activities. This would tackle the issue of nurses continuously having to come back to the office for new records, leading to countless hours spent unproductively.

Funding in Public Health

Relative to other health care expenses, funding for public health is low in Canada, subject to instability and as such, the system is under constant stress. Provinces and territories are each governed by separate legislation relating to public health, and there are distinct divisions between responsibilities at each level of government. In turn, the system is fragmented without cohesive leadership and direction[1]. Ontario's public health funding is structured differently from the other provinces, which fully fund the municipal public health programs. The proportion funded by the provincial government has increased from 50% in 1999[2], to its current state now. As with other municipal public health units, Springfield Public Health is funded 75% by the Ministry of Health and Long-Term Care and 25% by the City of Springfield[2].

---

[1] Parliament of Canada. (2002). *The Health of Canadians: The Federal Role - Final Report*. Retrieved 27 November 2015, from http://www.parl.gc.ca/content/sen/committee/372/soci/rep/repoct02vol6part5-e.htm#CHAPTER%20THIRTEEN

[2] Association of Local Public Health Agencies. (2010). *Orientation Manual for Board of Health Members*. Retrieved from http://goo.gl/NHhppL

The Canadian Health Care System - Roles and Responsibilities

Canada's publicly funded health care system is guided by the principle that health care should be delivered based on need, not ability to pay. The level of government responsible for care delivery is governed by the Canadian Constitution, which outlines the roles of the federal, provincial and municipal governments. Funded through taxation, the majority of health care in Canada is administered at the provincial level, and is reimbursed through tax transfers with the federal government. The responsibility for public health is shared between the federal, provincial/territorial and municipal levels of government, but is usually delivered at the more local municipal or provincial/territorial level. The federal government is responsible for the broader facets such as disease surveillance and prevention, supporting health promotion, and research. The planning and implementation of health promotion and public health initiatives falls under the jurisdiction of the provinces and territories[3].

History of Public Health Legislation in Ontario

In 1833, the Upper Canada legislation was passed to allow municipalities to create Boards of Health whose job it was to guard against malignant, contagious and infectious disease within Ontario. Municipalities and public health providers were to work together to improve living conditions in their communities. In the early 1900s, these functional areas began to operate separately, and were soon governed under separate legislation (the Planning Act and the Public Health Act, respectively). To this day, public health administration remains at the local level, with Boards of Health responsible for overseeing their programs and services. These boards operate separately from municipal administration. There are currently 36 public health units in Ontario[4].

The Public Health Act (PHA) was passed in 1873 as a measure to control communicable diseases and provide community sanitation support, with little emphasis on preventative efforts. It was amended in 1967 to require municipalities to provide full-time public health services. In 1983, the act was replaced with the Health Protection and Promotion Act (HPPA), which remains the most important legislation governing municipal Boards of Health. The introduction of HPPA changed the mandate of Boards of Health to require provision of preventative dentistry, family health, public health education, nutrition and home care. The Mandatory Health Programs and Services Guidelines were published in 1984 to set minimum, province-wide standards for public health care, targeting chronic care, infectious disease and family health improvement strategies. In 2009, this was subsequently revised and made part of HPPA Section 7: Ontario Public Health Standards (OPHS)[4]. The guidelines published in OPHS outline the legislative requirements for the health

[3] Health Canada. (2011). *Canada's Health Care System*. Retrieved 27 November 2015, from http://www.hc-sc.gc.ca/hcs-sss/pubs/system-regime/2011-hcs-sss/index-eng.php

[4] Public Health Ontario. (2014). *Municipal by-law development and public health: A primer*. Retrieved from http://www.publichealthontario.ca/en/eRepository/Bylaw_Primer_2014.pdf

programs and services each public health unit is required to provide[5]. See Exhibit 1 for a detailed timeline of the history of public health legislation in Ontario.

The People of Springfield, Ontario

The Springfield metropolitan area is made up of approximately 720,000 people, with annual growth rates on par with the national average. The majority of its inhabitants speak English as their first language; a rate significantly higher than in the rest of Canada[6]. As with the rest of the country, Springfield is facing challenges related to an aging population and the health care requirements therein.

Traditionally known for its strong manufacturing sector, recent years have shifted away from such jobs in Springfield, leading to a higher rate of unemployment than the provincial average. Movement towards a knowledge-based economy threatens the livelihoods of Springfield's residents, who are less likely to hold bachelor's degrees than the rest of the province. It also has a lower-than-average household incomes and therefore higher levels of poverty[7].

Internal Environmental Scan

For the past few years, Danielle had been collecting data for Springfield Public Health. She started off as an eHealth intern and was then hired on as a full-time project manager because she was able to demonstrate leadership qualities and a keen interest in improving internal processes. During her 8-month internship from May to December 2010, she conducted a needs analysis by meeting with nurses, physicians and administrative staff across 26 different programs (see Exhibit 2 for programs list). She examined the issues they were encountering in their day to day activities and how they would like to see things change to improve their patient care process and to get a better understanding of their current practices on patient record collection, storage and retrieval. Several issues were uncovered during this time. In conducting her analysis, Danielle discovered that there were significant gaps between the legislative requirements outlined in the Ontario Public Health Standards, and the performance of Springfield Public Health's programs. These discrepancies made evident the need for a drastic change in the way Springfield Public Health was operating. At the end of her internship, Danielle presented a report to the executive team at Springfield Public Health outlining her findings from the needs analysis and provided a recommendation to implement an EMR system. As an eHealth student, Danielle had learnt a lot about the functionalities and uses of an EMR system. She was confident that an EMR system would greatly benefit the organization.

---

[5] Ontario Ministry of Health and Long-term Care. (2013). *Introduction to the Standards - Ontario Public Health Standards*. Retrieved 28 November 2015, from http://www.health.gov.on.ca/en/pro/programs/publichealth/oph_standards/intro.aspx#Sta

[6] Statistics Canada. (2011). *Focus on Geography Series, 2011 Census - Census metropolitan area of Hamilton*. Retrieved 27 November 2015, from https://www12.statcan.gc.ca/census-recensement/2011/as-sa/fogs-spg/Facts-CMA-eng.cfm?LANG=Eng&GK=CMA&GC=537

[7] Human Services Planning Hamilton and Hamilton Community Services. (2010). *Demographic Profile*. Retrieved from http://www2.hamilton.ca/NR/rdonlyres/D7646C20-EA23-42FA-9452-1ECA22E8ED9C/0/HSP_TechReport_3.pdf

The Value of EMRs

Danielle was sure more than ever that an EMR would be beneficial to Springfield Public Health and in her recommendation report she noted five reasons for switching from a paper-based method to an electronic system.

Sustainability: The sustainability of the current, mainly paper-based databases being used to manage client information and support Springfield Public Health Service (PHS) practices, and the reliability of the simple spreadsheet software were questionable. There had not been a change in documenting practices for a very long time and with the evolution of technology in health care, and the time spent sifting through hundreds of paper forms was putting burden on the system. Exhibit 3 provides examples of the paper based documentation forms used to track patients and develop surveillance reports in the public health system.

In 2005, the government of Ontario mandated all the public health agencies in the province to report communicable diseases to a web-based system called the Integrated Public Health Information System (iPHIS). The public health agency in a region is responsible for gathering data from the local clinics and submitting it to iPHIS[8]. Hence, the Springfield Public Health Agency was overwhelmed with analyzing hundreds of paper forms and identifying useful information from them. Danielle recognized an opportunity here to simplify processes and comply to provincial requirements by using electronic medical records. An EMR system that could capture patient data during consultation would provide relevant information for public health case reporting[9]. The EMR systems have the functionality to generate customized data reports that can be converted into iPHIS export formats. Additionally, EMRs can directly push case reporting data to the provincial surveillance system.

Interoperability: Many documents were stored in unknown locations and in home-grown databases at Springfield Public Health. Some nurses were complaining about not being able to find the records they were looking for because they were stored in various places. Navigating and extracting information from these different applications to guide management decision-making was proving to be quite difficult for the physicians and nurse managers. Danielle had heard from her instructors in school that EMRs are not only efficient if used properly, but they can also save up to 20% of administrative time that could be put to better use serving and caring for patient needs.

EMRs store data in a central repository and authorized users of the system can access required data from any location. Therefore, it is easy to track relevant information from different locations. Also,

---

[8] Integrated Public Health Information System (iPHIS). (2004). Retrieved November 29, 2015, from http://odesi2.scholarsportal.info/documentation/PHIRN/IPHIS/SPH05003.pdf

[9] Lazarus, R., Klompas, M., Campion, F. X., McNabb, S. J. N., Hou, X., Daniel, J., … Platt, R. (2009). Electronic Support for Public Health: validated case finding and reporting for notifiable diseases using electronic medical data. *Journal of the American Medical Informatics Association : JAMIA*, *16*(1), 18–24. http://doi.org/10.1197/jamia.M2848

EMRs are designed with intuitive report generation tools. In a study to evaluate health information exchange for HIV/AIDS surveillance using EMRs, it was found that system assists the health care providers to monitor patient treatment adherence[10]. EMRs have enormous potential to enhance integration between clinics and the public health system. EMRs enable clinicians to offer timely and detailed information for public health surveillance without altering their current workflows or creating extra work[11].

Privacy: There were also security concerns for paper-based patient records while records were being transported from one location to another. Public Health Agency nurses often have to travel to see patients closer to home or at community centres and they carry these patient records with them during transit. Danielle knew that if an EMR were to be implemented patient records could be accessed from anywhere using a laptop with proper security checks and balances, and internet connection without having to worry about any records being lost, stolen or damaged. This could prevent any future breaches of paper files being accessed by non-medical personnel or outside agencies, which could cause media outrage and loss of confidence from the public. EMRs are designed to comply with federal and provincial privacy rules. In Ontario, EMRs undergo an accreditation process conducted by OntarioMD[12]. As per the guidelines, an EMR should have data encryption standards, authentication rules to restrict access, audit trails, and logs to track user access and data to be stored in de-identified form in a central database. An added benefit was that Springfield Public Health would incur fewer costs associated with mileage and travelling between locations to pick up patient records.

Patient safety: One of the main challenges Springfield Public Health faced was accessing proper medical history of patients as patients go from one public health clinic to another. Proper medical history such as past treatments, drug prescriptions and allergies are important for physicians for any future prescriptions and treatments. An EMR would be better at keeping track of repeat patient's information, as all clinics would be connected through the same system and provide access to patient's medical history in one place, rather than having to look in different databases and files, which is time consuming, inefficient and hazardous.

By implementing an EMR, Springfield Public Health could achieve the goal of a single record for a patient throughout the system. Patient data would be updated into the same record even though the patient visits different public health clinic every time. The EMR captures complete and accurate patient data, which can then be converted into informative reports. Care delivery for a

---

[10] Herwehe, J., Wilbright, W., Abrams, A., Bergson, S., Foxhood, J., Kaiser, M., … Magnus, M. (2012). Implementation of an innovative, integrated electronic medical record (EMR) and public health information exchange for HIV/AIDS. *Journal of the American Medical Informatics Association : JAMIA*, *19*(3), 448–52. http://doi.org/10.1136/amiajnl-2011-000412

[11] Klompas, M., McVetta, J., Lazarus, R., Eggleston, E., Haney, G., Kruskal, B. A., … Platt, R. (2012). Integrating Clinical Practice and Public Health Surveillance Using Electronic Medical Record Systems. *American Journal of Preventive Medicine*, *42*(6), S154–S162. http://doi.org/10.1016/j.amepre.2012.04.005

[12] EMR Validation Process. (n.d.). Retrieved November 29, 2015, from https://www.ontariomd.ca/portal/server.pt/community/emr_validation_process/230

patient can be coordinated across the system through the EMR, which allows for better monitoring of patient conditions to facilitate supportive decision-making, a reduction in medication errors, and other such patient safety measures.

Surveillance: The current system at Springfield Public Health was data heavy but knowledge from this data was poor. This is important from a public health surveillance perspective to allow for early trends of disease outbreaks and health factors in order to intervene sooner than later to minimize the impact. In the past year Springfield Public Health had been experiencing higher than usual reports of sexually transmitted diseases and the agency was able to collect a lot of patient data. However, they were unable to effectively use this data to transform into useful information in order to track and prevent future related occurrences.

A syndromic surveillance system based on EMRs can report real-time data for public health emergencies[9]. Data extracted from EMRs is an important source for secondary use. BC Centre for Disease Control (BCCDC) conducted a study by using longitudinal test data from the public health clinic EMRs. The study found that data from EMRs were beneficial in establishing a sentinel surveillance system to monitor sexually transmitted infections (STI) trends among gay or bisexual men and its prevention efforts[13]. In a study conducted at Columbia—Presbyterian Medical Center to improve the case reporting of tuberculosis, it was found that EMRs with clinical decision support are a beneficial tool for public health surveillance[14].

After reviewing Danielle's recommendation report, the executive team at Springfield Public Health was pleased with the time and effort she put towards the needs analysis and agreed with the recommended solution to implement an EMR system. Danielle was confident with her analysis and the benefits an EMR could bring to Springfield Public Health. Danielle and upper management made the executive decision to go ahead with the EMR. They decided to hire Danielle full-time as project manager to assess and implement the possible EMR solutions.

THE EMR PROJECT

As the project manager for the EMR initiative, Danielle appointed her team, which consisted of an application analyst, a new eHealth intern and a clinical coordinator. Danielle considered her options for an EMR solution that would meet their daily operational and reporting needs, while keeping in mind budgetary constraints of the project. The EMR project was allocated $75,000 for the assessment and implementation of the new system in a pilot location.

---

[13] Ling, D. I., Janjua, N. Z., Wong, S., Krajden, M., Hoang, L., Morshed, M., … Gilbert, M. (2015). Sexually transmitted infection trends among gay or bisexual men from a clinic-based sentinel surveillance system in British Columbia, Canada. *Sexually Transmitted Diseases*, *42*(3), 153–9. http://doi.org/10.1097/OLQ.0000000000000250

[14] Hripcsak, G., Knirsch, C. A., Jain, N. L., & Pablos-Mendez, A. (1997). Automated tuberculosis detection. *Journal of the American Medical Informatics Association : JAMIA*, *4*(5), 376–81.

The first option was to utilize the in-house IT department at Springfield to build a system from the ground up, as they knew the most about the organization's technical infrastructure. When Danielle approached the IT department about this project with the idea of building the EMR system in-house, the response was not favourable. The IT team felt that they were already overworked and could not handle the project with their current staff of two individuals.

Danielle considered her second option, which was looking into purchasing a commercial off-the-shelf (COTS) EMR solution. In her courses, she had learned about open source EMR and proprietary EMR solutions. The project team began their research to look at possible external vendors who can meet their needs.

Open Source EMR

Danielle began to look at an eye catching Open Source system that was developed by clinicians for clinicians. The EMR was started by the Department of Family Medicine at Springfield University, with the objective of producing a state of the art web-based EMR to support diverse academic and clinical functions. The system contains health care information with full billing capabilities, chronic disease management tools, prescription module, scheduling and other adaptable features. It could run locally in an office setting or be accessed over the internet[15].

Key features of the open source EMR include a referral system, secure message system, research tools, automatic lab imports and a prevention module, which captures and tabulates outstanding preventative and intervention practices. This proves its security through automatic nightly data backup, a complete audit trail, remote access with second level authentication and peer reviewed software development and quality control. Financially, there is no licensing needed, no additional fees for extra modules, no charge for access to Clinical Connect and minimal hardware requirements. Danielle was impressed, but a quick glimpse of the interface made her overwhelmed and unsure of the ease of usability for the front-line workers. Exhibit 4 shows a snapshot of the user interface of the open source EMR.

Proprietary EMR

The other option was to purchase a proprietary EMR. Under this system, the corporation has proprietary rights to their products, and offers a standardized service that benefits large health care organizations. They target health care companies with a product designed specifically to address the needs of outpatient and ambulatory organizations. This company's clientele consisted primarily of family physicians, specialists, and nurse practitioners. Proprietary systems come equipped with all necessary areas built in, such as billing. They process payments through a

[15] OSCAR EMR. (2015). *OSCAR Mcmaster*. Retreived from https://oscar-emr.com

SecureConnect system, which its clients, including health care organizations and insurance agencies, access through a web browser to transmit claims and payouts[16].

Despite its appeal, it is important to note that proprietary systems require users to follow their parameters. As a result, it is difficult for health care organizations to make adjustments depending on personal preferences. A fee is required if changes are necessary for the organization. The proprietary system that Danielle looked at required Internet Explorer in order to function effectively[17]. Danielle could see the benefits of this system, but she was unsure if it would suit a public health organization that would require customization.

Staff Response

Staff had heard indirectly that a big change was coming that would affect their processes and workflow. While some were happy and thought this was much needed to address ongoing issues in the agency, others were not very happy. Staff began to reach out to Danielle as they were apprehensive and did not understand the need for a change. The volume of negative responses shocked Danielle, so she decided to reach out to understand their concerns.

She first met with nurse Tara, who works in the Sexually Transmitted Infection (STI) clinic. Nurse Tara had been working at Springfield Public Health for the past 20 years and thought using an EMR would take away from her relationships with patients. She specifically noted "this will take me away from talking to my patients and instead I will be staring at the computer screen."

Danielle also met with nurse Tracy, who had been a nurse for over 30 years and wondered why the change was needed, as she had been working with the paper-based method for her entire career. She noticed the more experienced staff was especially resistant to this project because they felt there was no need to change what had been done for many years, and were even threatening to quit if the project was carried out.

Dr. Burns, who was a physician in the Mental Health Unit, was resistant to the implementation because he said he did not have time to go through training. Having to learn how to use the new system would take up a lot of his time. Although the initial learning curve seemed steep to some, once staff knew how to use the system, it would actually make their documentation practices faster, rather than slowing them down.

One of Public Health's new nurses worried whether she could access her patients' records when she was on the go. She feared connection issues would cause delays and further overwhelm the staff. She would need to be assured that this would not be the case with an EMR, as all staff already

---

[16] Nightingale Informatix Corp. (2015). Who we are | About nightingale. Retrieved November 20, 2015, from http://www.nightingalemd.com/about/who-we-are/

[17] Pinzaru, V. (2015). Primary care electronic medical records demonstration: A look inside the system [PDF document]. Retrieved from Lecture Notes Online Website: https://avenue.cllmcmaster.ca/d2l/home/146137

have agency laptops and BlackBerries that could be used to connect to the internet when they are out of the office.

The Decision

Danielle and her team, including Piper, the new eHealth intern, Lucas, the clinical coordinator and Charles, the application analyst, began their decision making process. See Exhibits 5 and 6 for their organizational structure and roles for this project.

In 2011, EMR use in public health in Ontario was just beginning[18]. Springfield Public Health wanted to be the first public health agency to implement an EMR, but Fairfax Public Health was also in the process of implementing an EMR. If Springfield Public Health wanted to be a leader in public health technology, they would need to act quickly. Given the limited budget and time constraints, the project team needed to choose a system that would make the users happy. In order to receive additional funding, Danielle and her team would need to show results by the end of the fiscal year for her contract to be renewed as well as the budget to be extended. Overall, Danielle and her team were overwhelmed with staff threatening to quit and choosing the most suitable EMR system. It was important to prove to the staff that this was the most beneficial option for their organization.

[18] Association of Local Public Health Agencies. (2015). *Comparison of EMRs in Use in Ontario Public Health Units*. Retrieved from http://c.ymcdn.com/sites/www.alphaweb.org/resource/resmgr/COMOH_EMR/COMOH_EMRWG_Comparison_28091.pdf

Exhibit 1

HISTORY OF PUBLIC HEALTH LEGISLATION IN ONTARIO

1873: The Public Health Act was passed for the first time.

1882: The initial Board of Health was established.

1884: The Public Health Act was amended and established a medical officer of health as well as the relationship with the Board of Health.

1912: And amendment to the Public Health Act was made, allowing health units to be established on a county basis.

1934: A county-wide health unit was established for the first time, through a grant from the Rockefeller Foundation.

1945: An amendment to the Public Health Act was made to allow provincial grants to be provided to municipalities to establish health units. By the end of 1945, six health units were in place.

1950: Two-thirds of the Ontario population were served by 25 county and 12 municipal health units in Ontario.

1965: Ninety-five percent of the population was served by 54 boards of health.

1967: An amendment to the Public Health Act was made so that organized municipalities would be required to provide public health services on a full-time basis.

1983: The Health Protection and Promotion Act (HPPA) was introduced to replace the Public Health Act. It was subsequently amended in 1990.

1997: The HPPA was updated to the most recent version, and the Mandatory Health Programs and Services Guidelines was published.

2004: The Ontario government announced Operation Health Protection: an Action Plan to Prevent Threats to our Health and to Promote a Healthy Ontario.

2005: The Ministry of Health Promotion was created in Ontario to develop healthy lifestyle programs.

2006: Smoking in enclosed public spaces is banned through the introduction of the Smoke-Free Ontario Act.

2006: The introduction of Health System Improvements allows for legislation for an Ontario Agency for Health Protection and Promotion, which is referred to as the "CDC (Center for Disease Control and Prevention) of the North."

2007: Support for Boards of Health from the Ministry of Health and Long-Term Care increased to 75% of the budget.

2007: The Ontario Agency for Health Protection and Promotion was established.

2008: In collaboration with the Boards of Health and Ontario public health professionals, the Ontario Public Health Standards (OPHS) were completed, effective January 1, 2009.

2009: The Initial Report on Public Health is released by the Ministry of Health and Long-Term Care with the purpose of promoting accountability for Boards of Health.

Courtesy of Association of Local Public Health Agencies. (2010). *Orientation Manual for Board of Health Members*. Retrieved from http://goo.gl/NHhppL

Exhibit 2

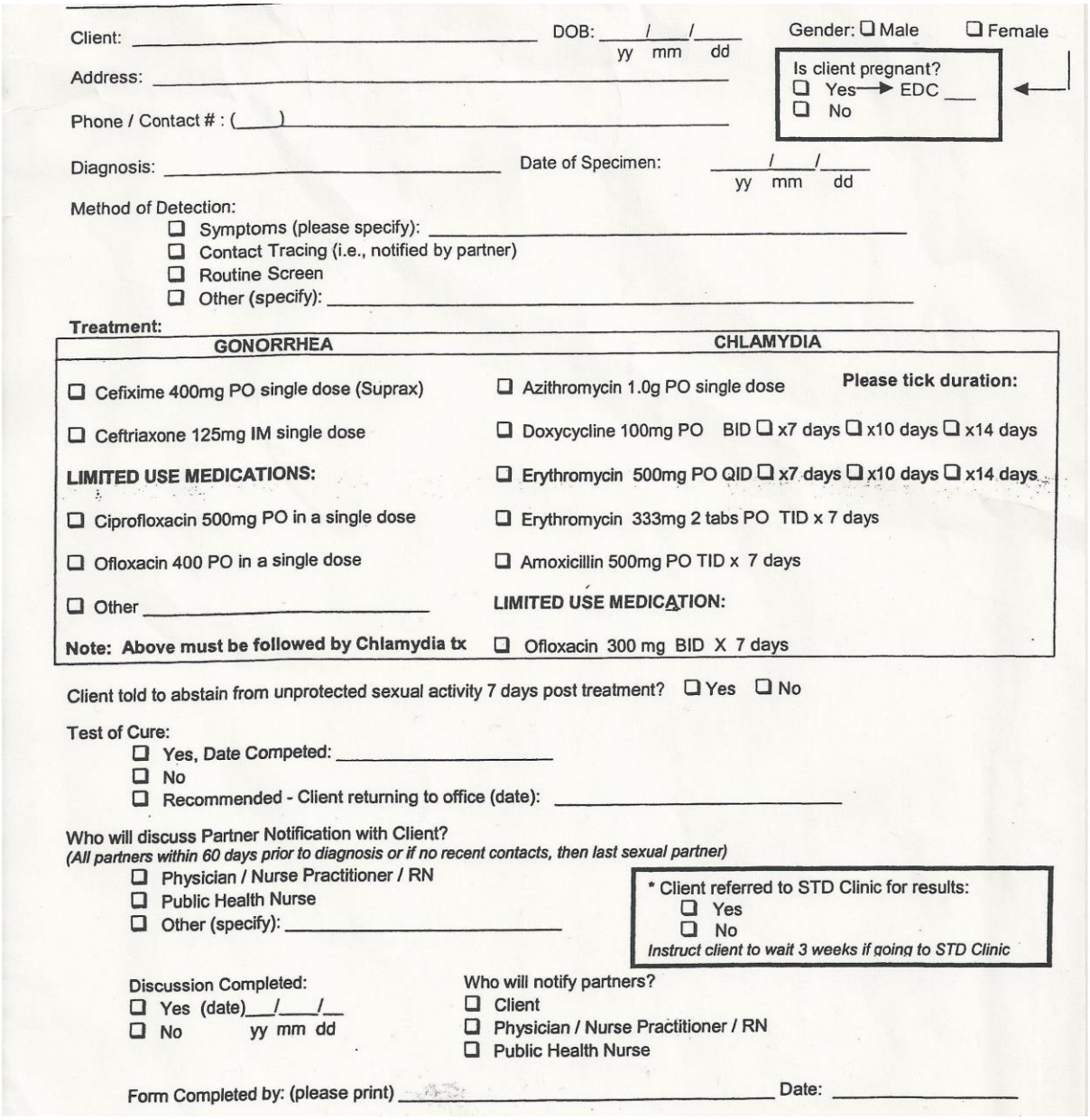
SPRINGFIELD PUBLIC HEALTH PROGRAMS

Sexual Health Clinics	**Reportable Infection Management:**	**Intake Lines:**	Breastfeeding Clinic	Dental Services
Intake Line	• Infectious Disease Tuberculosis	• Food Safety	Nurse Family Partnership	Vaccine Preventable Disease
Mental Health	• Infectious Disease Prevention and Control	• Safe Water	Reproduction	School Programs
Street Outreach	• Sexual Health	• Vector Borne Disease	Child Health	Healthy Baby Healthy Child
Infectious Disease Tuberculosis Intake Line	• Surveillance Unit	• Health Hazards	Tobacco Control	
Infectious Disease Prevention and Control Intake Line	• Business Operations	Surveillance Unit	Vector-Borne Disease Case Management	

Walden, D. (2015). *OSCAR EMR at Hamilton Public Health Services [PowerPoint slides]*. Retrieved 6 December 2015, from http://c.ymcdn.com/sites/www.alphaweb.org/resource/resmgr/COMOH_EMR/Hamilton_EMR_Presentation_Se.pdf

Exhibit 3

SEXUAL HEALTH CLINIC PAPER FORMS



Client: _____ DOB: ____/____/____ (yy mm dd) Gender: ❑ Male ❑ Female

Address: _____

Phone / Contact # : (____) _____

Is client pregnant?
❑ Yes → EDC ___
❑ No

Diagnosis: _____ Date of Specimen: ____/____/____ (yy mm dd)

Method of Detection:
- ❑ Symptoms (please specify): _____
- ❑ Contact Tracing (i.e., notified by partner)
- ❑ Routine Screen
- ❑ Other (specify): _____

Treatment:

GONORRHEA	CHLAMYDIA
❑ Cefixime 400mg PO single dose (Suprax)	❑ Azithromycin 1.0g PO single dose **Please tick duration:**
❑ Ceftriaxone 125mg IM single dose	❑ Doxycycline 100mg PO BID ❑ x7 days ❑ x10 days ❑ x14 days
LIMITED USE MEDICATIONS:	❑ Erythromycin 500mg PO QID ❑ x7 days ❑ x10 days ❑ x14 days
❑ Ciprofloxacin 500mg PO in a single dose	❑ Erythromycin 333mg 2 tabs PO TID x 7 days
❑ Ofloxacin 400 PO in a single dose	❑ Amoxicillin 500mg PO TID x 7 days
❑ Other _____	**LIMITED USE MEDICATION:**
Note: Above must be followed by Chlamydia tx	❑ Ofloxacin 300 mg BID X 7 days

Client told to abstain from unprotected sexual activity 7 days post treatment? ❑ Yes ❑ No

Test of Cure:
- ❑ Yes, Date Competed: _____
- ❑ No
- ❑ Recommended - Client returning to office (date): _____

Who will discuss Partner Notification with Client?
(All partners within 60 days prior to diagnosis or if no recent contacts, then last sexual partner)
- ❑ Physician / Nurse Practitioner / RN
- ❑ Public Health Nurse
- ❑ Other (specify): _____

* Client referred to STD Clinic for results:
- ❑ Yes
- ❑ No

Instruct client to wait 3 weeks if going to STD Clinic

Discussion Completed:
- ❑ Yes (date)___/___/__ (yy mm dd)
- ❑ No

Who will notify partners?
- ❑ Client
- ❑ Physician / Nurse Practitioner / RN
- ❑ Public Health Nurse

Form Completed by: (please print) _____ Date: _____

Exhibit 3 (continued)

LAST NAME (1-20) | FIRST (AND NICKNAMES) | ADDRESS (INCLUDE APT. NO., CITY & STATE)

BH 794579 (21-28)

DATE INITIATED (29-32) | AGE (33-34) | RACE (35) | SEX (36) M (1) F (2) | MARITAL STATUS (37) S (1) M (2) W (3) D (4) SEP. (5) UNKN. (6)

HEIGHT | SIZE, BUILD | HAIR (COLOR, STYLE) | COMPLEXION (SKIN) | PLACE, HOURS OF EMPLOYMENT (AND PHONE) | HOME PHONE

CONTACT

CONTACT REPORTED BY PATIENT WITH: (38-39)
☐ SYPHILIS STAGE_____ ☐ GONORRHEA ☐ OTHER VD SPECIFY_____

DATES OF EXPOSURE: FIRST | LAST

TYPE OF PATIENT (40)
☐ (1) MILITARY ☐ (2) PRIVATE PHYSICIAN ☐ (3) CLINIC

PATIENT IDENT. (41-46)

CONTACT'S RELATION TO PATIENT (47) ☐ (1) MARITAL
☐ (2) FRIEND ☐ (3) PICKUP NO FEE ☐ (4) OTHER (SPECIFY)_____

OTHER IDENTIFYING AND LOCATING INFORMATION (AS SPEECH, TEETH, PHYSICAL DEFECTS, TIME AND PLACE OF ENCOUNTER AND EXPOSURE, HANGOUTS, FRIENDS AND ACQUAINTANCES, MAP, ETC.) BE SPECIFIC:

SUSPECT

SOURCE: (48) ☐ (1) MILITARY ☐ (2) PRIVATE PHYSICIAN ☐ (3) CLINIC

DISEASE SUSPECTED: (49) ☐ (1) SYPHILIS ☐ (2) GONORRHEA ☐ (3) OTHER VD

REFERRAL BASED ON: (50) ☐ (1) PREMARITAL ☐ (2) PRENATAL ☐ (3) FOODHANDLER ☐ (4) SELECTEE ☐ (5) SEPARATEE ☐ (6) SURVEY ☐ (7) CLUSTER SUSPECT ☐ (8) CLUSTER ASSOCIATE ☐ (9) OTHER_____

INITIATING AGENCY (51-52) CLINIC CODE_____ | INTERVIEWER (53-55)

DISPOSITION (56)

☐ (0) NOT INFECTED
☐ (1) INFECTED, BROUGHT TO TREATMENT (PREVIOUSLY UNTREATED THIS INFECTION)
☐ (2) INFECTED, RETURN TO TREATMENT THIS INFECTION
☐ (3) PREVIOUSLY TREATED THIS INFECTION
☐ (5) INFECTED, NOT TREATED

IF INFECTED, GIVE DISEASE, STAGE: (57-58)

TREATED BY: (59-61) | DATE FIRST TREATED: (62-65)

☐ (X) EPIDEMIOLOGIC TREATMENT
☐ (Y) OTHER (SPECIFY)_____

☐ (6) UNABLE TO LOCATE
☐ (7) LOCATED, REFUSED EXAMINATION
☐ (8) INSUFFICIENT INFORMATION TO BEGIN INVESTIGATION
☐ (9) MOVED FROM JURISDICTION

NEW ADDRESS:_____

DATE FIRST EXAMINED (66-68) | INVESTIGATING AGENCY (69-71) | INVESTIGATOR (72-74) | DATE OF DISPOSITION (75-77)

PHS-2936 REV. 7-62

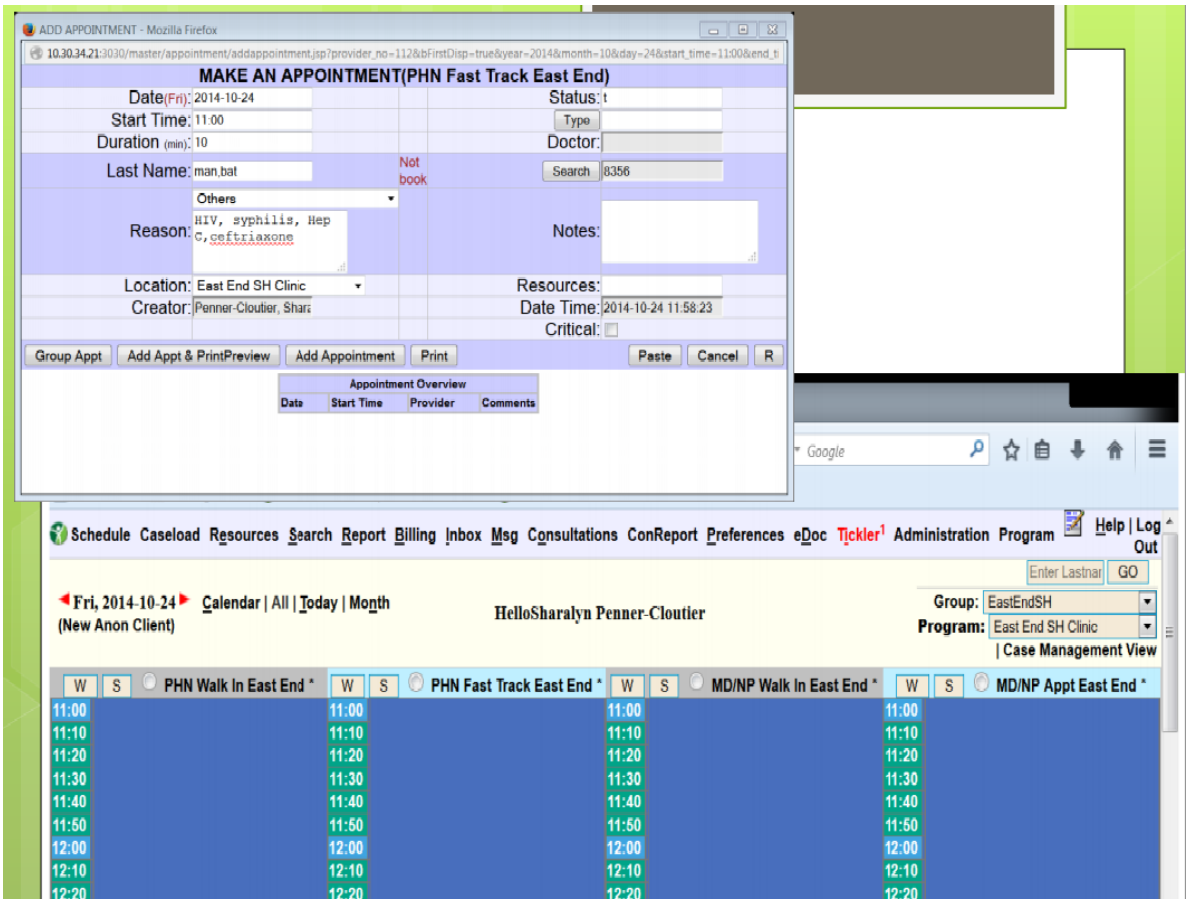
VENEREAL DISEASE EPIDEMIOLOGIC REPORT

4

FORM APPROVED BUDGET BUREAU NO. 68-R788

Exhibit 4

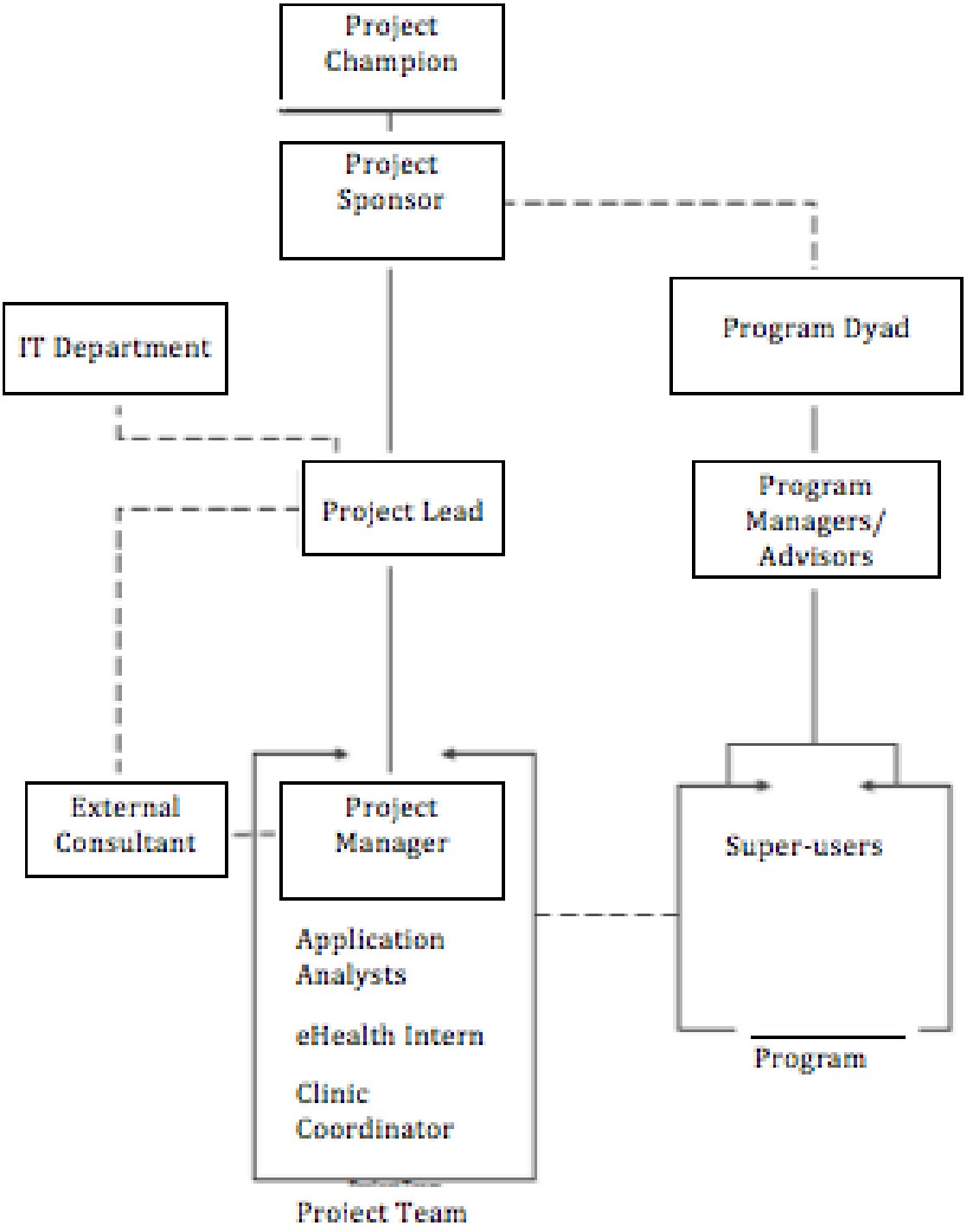
EMR MODULES



Walden, D. (2015). *OSCAR EMR at Hamilton Public Health Services [PowerPoint slides]*. Retrieved 6 December 2015, from http://c.ymcdn.com/sites/www.alphaweb.org/resource/resmgr/COMOH_EMR/Hamilton_EMR_Presentation_Se.pdf

Exhibit 5

ORGANIZATIONAL CHART



Walden, D. (2015). EMR implementation at Hamilton Public Health. Email correspondence.

Exhibit 6

ROLES AND RESPONSIBILITIES

Upper Management: Overlooks the whole organization and all its projects. Upper Management grants approval to all new initiatives before it is made public. Upper Management approved the EMR initiative.

Project Champion – Mary: The project champion is responsible for assisting project managers with the organizational support to obtain the corporate resources they need to implement projects[19]. Mary works closely with Upper Management, the Project Sponsor and the Project Manager. She is a strong supporter of the EMR initiative.

Project Sponsor – John: The project sponsor is given a senior management role, which allows them to ensure any project taken aboard remains a viable proposition and that benefits are realized[20]. John resolves any issues outside the control of the Project Manager. He supports the EMR initiative and creates an environment that allows the Project Manager to appropriately manage the EMR initiative. He will be working closely with Danielle to resolve each key issue presented.

Project Manager – Danielle: Project Managers make it their goal to develop a successful project and use their skill and expertise to inspire a sense of shared purpose within the project team[19]. Danielle is responsible for implementing an EMR into Springfield Public Health and working closely with staff throughout this project.

New Project Intern – Piper: Piper is the intern that was most recently hired. As this project began with the previous intern, Danielle, who has now been hired as the full time Project Manager, Piper is highly involved in the EMR implementation process. She works closely with Danielle and is responsible for any additional research required.

Clinical Coordinator – Lucas: Clinical Coordinators are in charge of everyday personnel concerns and ensure that all necessary resources are in place[21]. Lucas works closely with Danielle as part of the EMR implementation team, while working closely with staff and managing staff concerns. Overall, Lucas acts as a liaison between physicians, office managers, and staff within the organization and resolves conflicts.

Application Analyst – Charles: Application Analysts are responsible for delivering support to end users in the organization about how to use various types of software programs efficiently and effectively in fulfilling business objectives[22]. Charles is part of the EMR implementation team and

---

[19] Project Management Institute. (2015). Key to implementation success. Retrieved November25,2015,from http://www.pmi.org/learning/project-champion-key-implementation-success-2135

[20] Project Smart. (2015). Project sponsorship. Retrieved November 25, 2015, from https://www.projectsmart.co.uk/project-sponsorship.php

[21] Chegg Inc. (2015). Career center – Clinical coordinator. Retrieved November 25, 2015, from https://www.chegg.com/career-center/explore/clinical-coordinator

[22] Info-Tech Research Group. (2015). Application Support Analyst. Retrieved November 25, 2015, from http://www.infotech.com/research/application-support-analyst

handles the software aspect. Not only does he work closely with the end-users in training them to use the system, he assists Danielle with the design, delivery, and improvement of software applications.

External Consultant – Allen: An External Consultant is an individual external to the organization who can be contracted to provide expertise from a different point of view. Springfield Public Health contracted an External Consultant to be apart of the EMR implementation team to gain advice and recommendations from a third party with vast experience. Allen's purpose is to bring outside knowledge into their developmental stages.

Corporate IT Department: The IT Department is a separate department solely focused on the design, development, application, and support of computer-based information systems. The IT Department at Springfield Public Health focuses on the suitability of the EMR for Springfield, and how well it is functioning. The IT Department currently consists of two individuals, creating a limitation for their organization.

Super-Users: Super-Users are those who are accepting of the EMR system and believe that it has benefited the organization. Springfield Public Health is in search of who their Super-Users will be. These individuals will be the first point of contact for EMR uses within their department. They will assist with any additional training needed for staff members.

End Users – Nurse Tracey and Tara, Dr. Burns: The End-Users are those who actually use the EMR system, working closely with the Super-Users. In this case, the End-Users are the physicians and nurses working at the organization who enter patient information daily. Unfortunately, Springfield Public Health has been having a difficult time getting their End-Users to adapt to the new initiative.

Guidelines for the Instructor

1) Springfield Public Health is a fictitious public health service based on a real public health service.

2) We interviewed the project manager of the EMR initiative in the months of October and November 2015.

3) EMR Implementation is currently complete across 50% of their programs. A budget for the first year of the program totalled $77,424.80 is broken down as follows:

- Hardware: $41,504.80
- Software: $4,000
- One-time Training and Implementation Support: $31,920.00

4) EMR systems assessed:

- OSCAR (Open Source Clinical Application and Resource)
- Nightingale (Proprietary source)

5) OSCAR was selected as it met the following needs:

- Developed locally with large community of local users
- No long-term contract required
- Easily customizable
- Inexpensive

6) Key issues were mainly related to change management

- Lack of time to learn a new system
- Lack of confidence in technology
- IT team understaffed
- Loss of human interaction
- Poor staff morale

7) Actual Gantt chart for Sexual Health Clinics beginning 2013 on following page:

PHN = Public Health Nurses
CC = Clinic Coordinator
AA = Application Analyst
PM = Project Manager
Mac = McMaster/OSCAR EMR
SHT = Sexual Health Team

Stage *Milestone/Deliverables*	*Responsibility*	**2013**					**2014**						
		Aug	Sept	Oct	Nov	Dec	Jan	Feb	March	April	May	June	July
Phase 1: Planning & Development													
Work with developer to refine requirements (Sourceforge, email, calls)	CC, AA	x	x										
Code feature requests	Mac	x	x										
Participate in update calls/meetings	All	x	x	x	x	x							
Test feature requests and provide feedback to developers	CC, AA, PHN	x	x										
eFax set up	CC, IS												
Add new features to HPH branch	AA	x	x	x									
Create eForms (in Word)	PHNs	x	10th										
Initial coding of eForms	AA	x	x										
Send remaining eForms to Ronnie	AA		10th										
Advanced eForm coding	Mac		x	x									
Test and refine eForms	PHNs, Mac, AA, CC		x	x	x								
Define processes and Develop training material	CC, PHNs, PM		x	x	x	x							
Assess remaining hardware needs	PM, CC		x										
Order hardware (lap tops, label makers etc.)	PM			x									
Configure lab set up	Mac, CC			x	x	x							
Coordinate hardware installation	CC, PM				x	x							

Test everything at clinics	CC, AA, PM					x							
Develop support model	PM					x							
Phase 2: Implementation													
Train clinic leads	CC, PHNs, AA				x								
Train staff	CC, CL, PHNs, AA					x							
Install Firefox for all staff	CC					x	x						
Go Live (1 clinic at a time)							x						
Phase 3: Support													
On-site support during implementation	CC, PHNs, PM, AA, IS?						x						
Implement support model	CC, PM, AA						x	x	x	x	x	x	x
Monthly/Quarterly support and evaluation meetings	All									x			x

Walden, D. (2015). EMR implementation in Public Health. Email correspondence.

McMaster University
1280 Main St. W. DSB A202
Hamilton, ON
L8S 4M4

Tel: 905-525-9140 ext. 23956
Fax: 905-521-8995
Email: ebusiness@mcmaster.ca
Web: http://merc.mcmaster.ca