

**Mental Health Outpatient Information System (MHOIS) Data
Quality Improvement Project**

by

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Acknowledgement and Endorsement

This internship report has been written by Abrar Ali Shah and has not received any previous academic credit at this or any other institution.

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Abrar Ali Shah

Executive Summary

Mental Health Outpatient Information System (MHOIS) is used to store demographic, socio-economic, administrative and clinical data of mental health patients seen at various facilities offering Mental Health Services throughout the province of Nova Scotia (NS). The MHOIS data is used by the Department of Health (DoH) to increase its ability to audit, evaluate, monitor and fund services. [1] It is important for DoH, NS to collect consistent, accurate, comparable information timely from all the nine District Health Authorities in the province for above-mentioned purpose. DoH drew attention of some of the hospitals to data quality problems and Izaak Walton Killam (IWK) was one of them.

The Department of Psychiatry of the IWK hired author as an intern to research on how to improve the MHOIS data quality working very closely with Decision Support Services (DSS) team. This internship goal was set up to review the manual and ensure all the IWK MHOIS administrative and clinical staff were aware of the guidelines and time lines for submission, ensure proper program codes were assigned to each event. Review current practices and forms to ensure they met the guidelines and were being used appropriately. Quality check processes should be developed to ensure all the MHOIS data submitted by the central clinics of the IWK to the DoH was accurate, consistent and comparable. Reports were to be reviewed and analyzed utilizing the Cognos Cubes for distribution of the provincial MHOIS data. The completed project would be presented to the Mental Health Operations Committee.

The intern divided the MHOIS data quality improvement project in three phases. The first phase of the project was to analyze the problem in detail. The second phase was to develop the solutions and strategies to fix the data quality problems. The third phase was to test and implement the recommended solutions.

In the first phase of the internship, the intern realized that it is a research-oriented project.

The intern and a team member from DSS department visited all the physical locations that offer Mental Health Services at the IWK to perform root-cause analysis. The routine process of collecting, storing and transferring of the MHOIS data was observed and investigated. All the people were involved in this process including administrative and clinical staff who were interviewed. After completing the first phase of the internship, the findings and the recommendations were presented by the intern to the Mental Health Operations Committee at the IWK on May25, 2006. The key findings were duplicate entries, data entry errors, inaccurate capture of the MHOIS data, lack of audit procedures, no deadlines for submission of the MHOIS data, loss of some MHOIS events, inconsistent and irregular backup of the MHOIS data, lack of the processes and no ownership of the MHOIS overall. The intern and DSS team suggested these recommendations: A Standard MHOIS form should be used, develop quality checks, establishing firm deadlines for clinicians and administrative Staff, training / refresher session for administrative and clinical staff, creating Centralized Backup System, an appointment of a MHOIS Co-ordinator and transfer of data through E-mail within IWK. The Mental Health Operations Committee at the IWK approved all the recommendations.

The intern faced some challenges in the second phase of the internship to develop informatics solutions because of limited resources and unavailability of some of the key staff due to vacation season. Another major hurdle was to find the solution within the MHOIS system and existing

workflow at all the clinics. The intern categorized all the problems into three major categories: People, Processes and Technology. The MHOIS system is 14 years old and is based on outdated technology. After thorough study of the MHOIS manual, investigation of the MHOIS information system, getting some assistance from MHOIS consultant and Programmer/Analyst at DoH, and having a technical background the intern was able to find workarounds to generate solutions to resolve data quality problems. The intern created solutions by using information technology, establishing processes and providing training to staff

The third phase of the internship was to implement solutions. The intern believed that MHOIS users required refresher training to fix most of the data quality problems. Hence the comprehensive training material was prepared and distributed to the administrative and clinical staff. The intern along with the team member of the Decision Support Services (DSS) department delivered the training to all the administrative and clinical staff at all the satellite and central clinics.

Some of the improvements were achieved immediately, and other improvements will be achieved after following the administrative and clinician training documents. The improvements following the solutions implemented are faster data transmission using E-mail within the IWK, reduction of the manual and Paper work for the administrative staff, consistent collection of the MHOIS Data, development of the quality checks of the data, merger of the clinic-specific unique client numbers to IWK unique client number (K number), processes for the administrative staff, principal diagnosis coding consistency, creation of the centralized backup systems, firm Deadlines for timely data Submission, reduction of the MHOIS data entry errors and duplicate entries.

In order to maintain the sustainability of the data quality, MHOIS coordinator to be appointed should ensure maintenance of all the established processes, quality checks and the standards for collecting and submitting accurate, consistent, comparable IWK MHOIS data. In addition to that, the MHOIS coordinator should send a reminder to clinicians and the administrative staff before deadline and detect the discrepancy between data submission and the data available on Cognos cubes at the secured web site of DoH.

The Provincial MHOIS Committee has requested the IWK authorities and the intern to share the work done at IWK to improve MHOIS data quality with all its members at the quarterly Provincial MHOIS Committee meeting. The Mental Health Operations Committee at the IWK has approved the request made by the Provincial MHOIS Committee.

During the project, it was observed that some of the administrative staff logged on locally to their workstations (computers) but not on the IWK network and hence were unable to see the network drives. All their important work was saved on the C: drive of their computer. In case of computer or hard disk failure, the useful and the important data files can easily be lost. This was brought to the attention of higher authorities of Mental Health.

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1.0 Introduction

Mental Health Outpatient Information System (MHOIS) is used to store demographic, socio-economic, administrative and clinical data of mental health patients seen at various facilities offering Mental Health Services throughout the province of Nova Scotia (NS). The MHOIS information system was implemented in all Mental Health Clinics across Nova Scotia in 1992. “The Department of Health (DoH) uses MHOIS data to enhance its ability to audit, evaluate, monitor and fund services.” [1] It is important for DoH, NS to collect consistent, accurate, comparable information timely from all the nine District Health Authorities in the province for above-mentioned purpose. DoH drew attention of some of the hospitals to data quality problems and IWK was one of them.

DoH noticed that some of the MHOIS data received from IWK was not comparable and had some serious data quality problems. The Department of Psychiatry hired author an intern to research on how to improve the MHOIS data quality working very closely with Decision Support Services team. The intern identified the causes of poor data quality, analyzed them in depth and explored strategies to fix the problem and finally implemented all the recommendations provided as a solution. The intern got an opportunity to attend the Provincial MHOIS Committee meeting along with his Supervisor and the manager; the intern described some of his current work in the meeting. The Provincial MHOIS Committee was impressed and requested the IWK authorities and the author to share all the work done at IWK with its members.

As it was the first time for the intern to work in any health care organization, the internship provided a great learning experience and exposure to healthcare environment, workers, professionals and executives. The intern not only clearly noticed the need of informatics solution in Mental Health Care but also felt to manage change effectively when new processes are introduced for using existing and new technological solutions. The intern got the opportunity to train administrative and clinical staff during the internship period and found different levels of knowledge concerning usage of information technology. It was a surprise to the Mental Health Operations Committee at IWK when the author informed them the MHOIS data at some clinics was not backed up.

2.0 IWK Health Centre

The IWK Health Centre is located in Halifax, Nova Scotia. It is one of the most reputable health service provider institutes because of its world-class research into disorders and diseases; and the excellent delivery of mental health and addiction services. [2] Being a teaching institute, it offers learning opportunity for residents in psychology, psychiatry, pediatrics, social work, nursing, etc. Research, education and clinical care are the important elements of IWK’s mission. Its vision is “Health families. The best care”.

At the IWK, health services are categorised into three programs: Children’s Health; Mental Health and Addictions; and Women’s and Newborn Health. [3]

2.1 Mental Health and Addictions Program

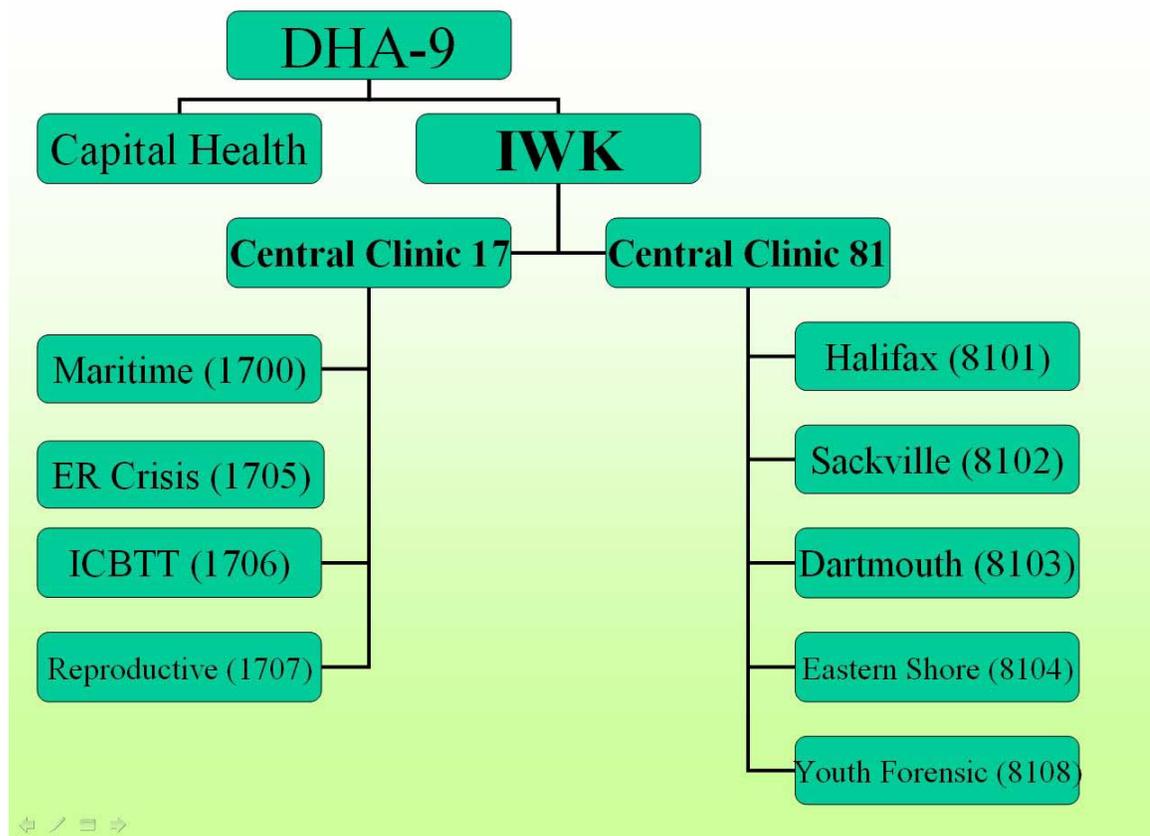
“The Mental Health and Addictions program serves the intermediate and highly complex mental health needs of Maritime children and youth (to the age of 19) and their families.” [4] Addiction program “CHOICES” has been transferred from Capital Health to IWK recently. The IWK offers

Mental Health service as Program-Based Care Model such as Child & Youth Outpatient, Child & Youth Mood Disorders, Child & Youth Eating Disorders, Child & Youth Emergency, Child & Adolescent Community Support, Adult Outpatient (Mental cases related before and after pregnancy), Adult Forensic Services and Sex offender Program. The IWK not only serves the needs of mental health of Halifax Regional Municipality population but also rural areas of Nova Scotia and other Maritime provinces through travelling clinics and telehealth conferencing.

2.2 Mental Health Clinics or Services at the IWK

District Health Authority 9 is composed of the IWK Health Centre and Capital Health. There are two mental health central clinics at IWK. Central clinic 17 has four satellite clinics: Maritime, ER Crisis, ICBTT and Maritime. Maritime Psychiatry Clinic is satellite clinic and also serves as central clinic. Central clinic 81 has five satellite clinics: Halifax, Sackville, Dartmouth, Eastern Shore and Youth Forensic. The following diagram 1 illustrates all the satellite and central clinics within IWK.

Diagram 1: Mental Health Clinics and Services at the IWK



2.2.1 Maritime Psychiatry Clinic

This is an outpatient and off site clinic located at Charter House. It has three programs: Child & Youth Outpatient, Child & Youth Mood Disorders and Child & Youth Eating Disorders. It also provides consultations and assessments through telehealth conferencing to remote areas of Nova Scotia and other Maritime provinces.

2.2.2 Emergency Crisis Service

This service is located in the Emergency room of the IWK Health Centre. The crisis team provides 24 hours emergency mental health service. [5]

2.2.3 Intensive Community Based Treatment Team (ICBTT) Clinic

This is an off site clinic located at VIA Rail. At this clinic, an interdisciplinary team provides intensive treatment program to children and adolescents up to age of 19.

2.2.4 Reproductive Mental Health Clinic

This clinic is located at IWK Health Centre. It serves the mental health needs of women before and after pregnancy.

2.2.5 Community Mental Health Outpatient Clinics

Halifax, Sackville, Dartmouth and Eastern Shore are off site and Outpatient clinics. Halifax clinic is located at Young Tower. Dartmouth and Eastern Shore clinics are located at Dartmouth Medical Clinic. Sackville clinic is located at Cobequid Community Health Centre.

2.2.6 Youth Forensic Services

This service is off site and located at Waterville. It provides Provincial Child & Youth Forensic Services.

3.0 Mental Health Outpatient Information System (MHOIS)

The Mental Health Outpatient Information System MHOIS is 14 years old and is a stand-alone information system and it does not communicate with any other healthcare information system. Initially it was DOS based but afterwards it was upgraded to the Windows (point and click) environment. It lacks graphical user interfaces that most modern healthcare systems offer. In addition to that, the MHOIS has a lot of limitations to store and retrieve information effectively. It was launched in 1992 in all the Mental Health Clinics across Nova Scotia. The DoH is responsible for providing support for MHOIS. [1] Currently DoH is looking for replacing MHOIS with new friendly, flexible and adaptable system that can meet the needs of clinicians, managers and the DoH. Before data quality problems are discussed, it is important to know how the MHOIS data is captured and used. The following two paragraphs will describe in detail the capture, flow and use of the MHOIS data from the point it is obtained and its flow to provincial and federal organizations responsible for collecting and disseminating health information for several purposes.

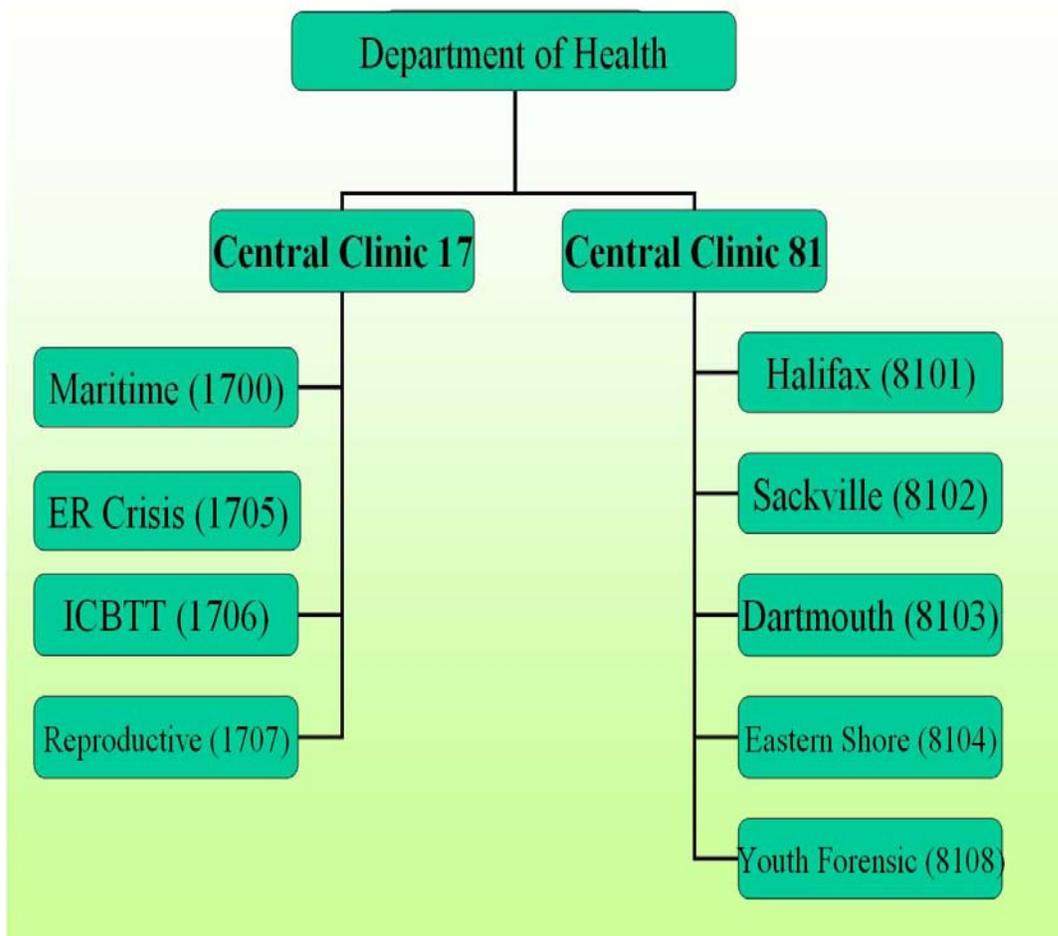
3.1 Collection and Flow of the IWK MHOIS Data

Clinicians at all satellite clinics are to complete all the information required on the MHOIS form (attached as Appendix 1) and submit the MHOIS forms on a daily basis to the Administrative staff to enter into MHOIS. [1] Once Administrative staff receive all the completed MHOIS forms, they enter all the data into MHOIS. The MHOIS data is extracted on the floppy disk at each satellite clinic once in a month. Then all satellite clinics send the floppy disk containing MHOIS data to their respective central clinics through courier or internal mail. The central clinic aggregates all the MHOIS data received from its satellite clinics and updates the MHOIS database at central clinic. Afterwards, the central clinic extracts the MHOIS data again on the floppy disk and sends it to the DoH through courier every month. When DoH obtains the

MHOIS data from all District Health Authorities, the master MHOIS database at the Department of Health is updated each month. [1]

ER crisis service, ICBTT and Reproductive Mental Health clinic send their MHOIS data to the Central Clinic 17. Halifax, Sackville, Dartmouth, Eastern Shore and Youth Forensic service send their MHOIS data to the Central Clinic 81. 17 and 81 numbers have been given to them by DoH. Both Central Clinics gather MHOIS data of their satellite clinics and aggregate them at their database and finally send the updated MHOIS database to DoH. Please refer to diagram 2

Diagram 2: Collection and Flow of the MHOIS Data



3.2 Purpose and Usage of the MHOIS Data

The IWK uses MHOIS data to report service activity and status counts every month for internal reporting to the Finance / Decision Support Services Department; and for external reporting to DoH, NS and CIHI through Management Information System (MIS) submission, one of the CIHI standard.

DoH uses the MHOIS data for creating Data Cubes using Cognos 8 Business Intelligence (BI)

software. Cognos 8 BI is one of the best business intelligence programs for reporting and analyzing data. The managers and other concerned persons have access to the Cognos Cubes that are provided through secured DoH web site.

Using the Analysis Studio, large amounts of data built transformed into cubes can be analyzed using different measures, dimensions and levels with ease and convenience even by non technical persons who don't know how to write queries to retrieve information from the databases. Measures can be Active unique Clients, Case Closure Count, MHOIS visits, MIS visits, Event Span (in days), etc. Dimension can be all District Health Authorities, Gender, Fiscal Years, Closure Types, Closure reasons, Age, Occupation Type, Occupation Status, Program Code, etc. Levels can be at clinics in each central clinic or in each District Health Authority, Child or Adult, Quarters of each Fiscal year, Clinical or Administrative or Automatic Closure, Eating disorder or Mood Disorder, etc.

The managers and executives can generate reports based on almost all the fields of MHOIS form (attached as Appendix 1) to plan, monitor and evaluate the Mental Health Services in order to gain further insight and improve performance. It can be effortlessly find out from the Cognos cubes that how many unique clients were seen in each quarter at each clinic with their principal and secondary diagnosis. Another example can be that how many total MHOIS events (Registration, assessment and repeat transactions) or case closures occurred at IWK versus Capital health and all other eight District Health Authorities in any specific time period. In order to analyze and compare data, it is necessary to have quality data timely.

4.0 Data Quality: Findings, Developing informatics solution and implementation

The Intern used four steps approach: identifying the problem clearly, analyzing the problem in detail, developing solution; and implementing recommended solutions. The intern along with Decision Support Services (DSS) team at the IWK identified the data quality problem and its impact on future funding, resource planning and effective decision-making process. In order to analyze the problem, the intern thoroughly studied the MHOIS manual, explored the MHOIS system, examined the Cognos Cube reports and understood the workflow of the MHOIS data. In addition to that, the intern met with the MHOIS Consultant and Programmer / Analyst of DoH and discusses various issues regarding the MHOIS and its data via E-mail and phone calls.

4.1 Findings (Research-oriented work) - The First Phase of the Internship

After getting the first hand information from the concerned key people, the intern realized that it is a research-oriented project and it can not be carried out from the office. After consultation with the supervisor and the manger, the intern and a team member from DSS department visited all physical locations that offer Mental Health Services at the IWK to perform root-cause analysis. The details of the location and services have already been given under "2.2 Mental Health Clinics or Services at the IWK". The routine process of collecting, storing and transferring of the MHOIS data was observed and investigated. All the people were involved in this process including administrative and clinical staff were interviewed. After completing the first phase of the internship, the findings were presented by the intern to the Mental Health Operations Committee at IWK. The intern's work and the performance were highly appreciated by The Mental Health Operations Committee of IWK. Some of the key findings are presented as follows:

1. Duplicate entries of the same MHOIS event in the MHOIS

2. Customized MHOIS forms were being used at many clinics
3. Data entry Errors (e.g. Deferred diagnosis R69, etc)
4. One unique client can be counted more than once (maximum up to 6) in the MHOIS
5. Inconsistent capture of Socio-Economic Information and not updating Socio-Economic information
6. Inaccurate information entered for principal diagnosis by some administrative staff
7. Lack of training, understanding or knowledge of MHOIS (e.g. Clinical Closures Versus Automatic Closures, etc)
8. Delayed transfer of MHOIS data within IWK because of traditional approach through courier or internal mail
9. No firm deadlines for Clinicians, Admin Staff at Satellite and Central Clinics to submit the MHOIS Data
10. Inconsistent and less frequent backup of the MHOIS data
11. Lack of Audit Procedures for the MHOIS data
12. Unavailability of the MHOIS Manual at facilities for Clinicians and Administrative Staff
13. Loss of some MHOIS events because of not completing the MHOIS forms on the same day by Crisis team
14. Last but not least, no overall ownership of the MHOIS

The intern and DSS team suggested following recommendations in the same presentation to The Mental Health Operations Committee of IWK.

- Standard MHOIS should be used
- Developing Quality Checks
- Establishing Firm deadlines for Clinicians and Administrative Staff
- Training / refresher session for Administrative and Clinical Staff
- Creating Centralized Backup System
- Appointment of MHOIS Co-ordinator
- Transfer of Data through E-mail within IWK

After getting approval from The Mental Health Operations Committee of IWK, the intern started the second phase of the internship.

4.2 Developing Informatics Solution- The Second Phase of the Internship

The intern faced some challenges at this stage while developing informatics solutions within the existing MHOIS system. The intern with the DSS team had the meeting with all the Mental Health Services managers at the IWK to discuss potential solutions. In the meeting, potential barriers e.g. increased workload; limited resources and unavailability of some of the staff due to vacation season, etc were identified.

The intern investigated and explored the MHOIS system again to find most of the solutions within the system. After thorough study of the MHOIS manual, investigation of the MHOIS information system and having a technical background, the intern was successful to find some workarounds to fix most of the problems. The intern believed that most of the MHOIS users required refresher training. Hence the comprehensive training material was prepared for the administrative and clinical staff. Other informatics solutions were data transfer through E-mail and the design of the centralized backup system. The implementation of the solutions was the

third phase of the internship.

4.3 Implementation of the Solutions & Improvements- The Third phase of the Internship

The intern divided all the problems into three major categories: People, Processes and technological. Therefore, the intern created solutions by using information technology, establishing processes and providing training to staff. Some of the improvements were achieved immediately, and other improvements will be achieved after following the administrative and clinician training documents. The improvements following the solutions implemented are described below.

4.3.1 Data Transmission through E-mail

Data transmission time was reduced from 3-5 days to a few minutes by introducing the MHOIS data transmission through E-mail from the satellite clinics to the central clinics within the IWK. As all the MHOIS computers at the IWK are on the same private network and behind the Firewall; hence it is safe and secure to send the patient data through E-mail. While sending data to DOH from the IWK through E-mail is risky as patient data will cross over the internet and internet is the public network; therefore, there is a risk for the compromise of patient data. Data transmission through E-mail not only saved time but improved efficiency as well.

4.3.2 Reduction of the Manual / Paper work for Administrative Staff

Apart from sending data from the satellite clinics to the central clinics, the administrative staff are to send the “Activity Summary Report” and “The MHOIS Data Transmittal Form”. The MHOIS system is designed to print only on the dot matrix printer. Many clinics did not have a dot matrix printer and they were looking at the MHOIS screens on the monitor and noting the information on the paper. All the administrative staff at the satellite clinics were shown the workaround to print on the laser printer. They were also trained to save the files of “Activity Summary Report” and “The MHOIS Data Transmittal Form” using the electronic form on their computers and send these files with the MHOIS data to the central clinics. The manual and paper work was reduced by using the electronic files.

4.3.3 Consistent Collection of the MHOIS Data

Many clinics were using their own customized forms to collect the MHOIS data as it fits to their needs. The disadvantage of using these forms was that they didn't have all the fields to capture complete and consistent information. Different clinicians had different needs to add extra information on the MHOIS form. As the standard MHOIS form didn't have any space left to write clinical notes, the backside of the MHOIS form was suggested to use for clinical notes or ambulatory record. All the administrative staff were shown to use the standard MHOIS form and print the ambulatory record on the back side of the same form. Clinicians were also shown to print clinical notes from their computers on the backside of the standard MHOIS form.

4.3.4 Merger of the Clinic Specific Unique Client Numbers to the IWK Unique Client Number (K number)

Historically some clinics e.g. Halifax, Sackville, Dartmouth and Eastern Shore community clinics were not part of the IWK. When they became part of the IWK, they continued to use their clinic specific unique client number in their MHOIS database. If one patient goes from one clinic to another clinic, the patient will be given unique client number at each clinic and the patient can be counted more than once (maximum up to 6) unique clients in the IWK MHOIS data. The process was developed to fix this problem and make the count of unique client number accurate and comparable.

4.3.5 Set-up Audit Procedures / Quality Checks

In the MHOIS system there were many reports. The intern run all the reports and understood them and finally selected some reports as audit procedures to fix three problems: deferred diagnosis, case closure and completeness of data. The clinicians record diagnosis deferred (R69) in the principal diagnosis field on the MHOIS form. Some clinicians never close the cases. Some times the patients were registered in the MHOIS system but their “assessments” were not entered. Using quality check reports, the clinical and the administrative staff can ensure that data is complete and accurate before submitting it to DoH.

4.3.6 Reduction of Data entry Errors and Duplicate entries through personal training

Through personal training to the administrative staff of all the clinics, the data entry errors and the duplicate entries were reduced. In one instance, one MHOIS event was entered three to four times at one clinic. This inflated the MHOIS events significantly. The Cognos data cube on the DoH web site demonstrated the unusually high number of the MHOIS events for that clinic. In another instance, when the clinicians indicate the principal diagnosis on the MHOIS form on the second or third visit for the patient, the administrative staff was did not replace the deferred diagnosis (R69), entered at the time of the first visit of the patient, into the MHOIS system with the new principal diagnosis. The principal diagnosis was being entered as secondary diagnosis and the deferred diagnosis (R69) remained the principal diagnosis. Therefore the majority of the cases had the deferred diagnosis (R69) as the principal diagnosis. Again the Cognos data cube on the DoH web site reflected the significantly higher number of the deferred diagnosis (R69) for that clinic.

4.3.7 Firm Deadlines for Data Submission

In order to meet the deadline (third Friday of the following month) set up by the DoH. The firm deadlines were established. The deadline for clinicians was the 5th working day of the following month to complete the MHOIS forms and return to the administrative staff. The deadline for the administrative staff at the satellite clinics was the 10th working day of the following month to send the MHOIS data to their central clinics. The deadline for the administrative staff at the central clinics was the 18th working day of the following month to submit the MHOIS data to DoH.

4.3.8 Processes established for Administrative Staff

The four processes set up in order to produce accurate, comparable and consistent data on time.

- a) Merging clinic-specific unique client number to one IWK Unique Client Number i.e. K number
- b) Data Submission using E-mail within IWK
- c) Audit processes for quality checks
- d) Established deadlines for Admin Staff at satellite & Central clinicians and also for clinicians

All the above-mentioned processes were documented and included in the educational package that was distributed to all the administrative staff. Hands on training were also delivered to all the administrative staff and some clinicians.

4.3.9 Principal diagnosis Coding consistency improvement

Recording of Principal diagnosis was made consistent by encouraging clinicians to complete the Principal diagnosis field on the MHOIS form. The Clinicians were also suggested to record the complete ICD-10 code, for the sake of accuracy, in four or five digits rather than just three digit code.

5.0 Development of the Centralized and Automatic Backup System

Although a backup system was not part of the internship goal, the intern because of his technical background indicated the issues with the current backup system during the first phase of the internship. The intern found that backup of the MHOIS data was not being done on regular basis and it is inconsistent at the satellite and central clinics. At some places, backup was being done locally to burn the data files on CD once a month. And at other places it was being done over the network to home folders of the administrative staff or to different folders on the network. Some administrative staff were not aware of the procedure of taking backup. Once administrative staff completed the backup, there was no verification process to confirm if the backup was done correctly.

The intern suggested and designed the centralized backup system. The intern and the team member of DSS had the meeting with the Information Technology Services (ITS) Manager to discuss the new backup plan for the MHOIS data at the IWK. The intern explained all the requirements and aspects of the new centralized backup system. The main features were a) all the MHOIS data should be backed up at one place on the network b) it must be done on a daily basis at the end of the day c) it must be automatic so that there is less user intervention in order to free up the administrative staff to focus on other duties d) verification process of the backup to ensure all the MHOIS computers are being backed up.

Because of the vacation time, the ITS manager suggested a temporary and permanent solution. The temporary solution was to immediately train people to backup the MHOIS data as usual. After a few days, the permanent solution i.e. the new centralized backup plan will be implemented. At the time of the completion of the internship, the new back system was in the process of development. During the training session of the administrative staff, the intern checked the partially developed new plan and made administrative staff familiar with the new system. It is hoped that in a near future it will be fully implemented and monitored by the MHOIS coordinator to be appointed.

6.0 Conclusion

The Department of Health desires to have the quality MHOIS data on time from all the district health authorities. It is important for IWK to have efficient processes, well trained staff and effective usage of the information technology in order to achieve the target set by the DoH. During this internship, the intern focused on and divided the work based on these three factors: People, Processes and technology to increase the MHOIS data value of the IWK.

During the internship period, the processes were established and the audit procedures were developed for checking the data quality. The administrative and the clinical staff were trained to be knowledgeable about the requirements and usage of the MHOIS to generate quality data. Technology was used in some of the solutions. It played a significant role to expedite the process of data transmission within the IWK and ultimately to its final destination i.e. DoH. In addition to that, information technology was also used to design an efficient, reliable and automatic Backup system. Although MHOIS has limitations due to its age and its outdated technology, the author and the DSS team strongly believe that the internship goal, improvement of the MHOIS data quality, has been achieved to a great extent.

7.0 Recommendations

The intern made the following suggestions for the IWK as well as for the DoH.

7.1 Recommendations for the IWK

The following recommendations are proposed to the authorities of the IWK as follows.

7.1.1 Sustainability

The MHOIS coordinator to be appointed should ensure to maintain all the established processes to collect consistent and accurate data and its timely submission. Therefore immediate hiring of the MHOIS coordinator is strongly suggested to ensure the sustainability of generating, storing and transferring quality data from IWK to the DoH.

7.1.2 Auditability

The MHOIS coordinator to be appointed should detect discrepancy between the MHOIS data of the IWK submitted to DoH and the data shown on Cognos cubes at the web site of the DOH. The auditability process will help ensure that there is no formatting, coding or any other technical problem in the process and information shown on the cognos cubes is the actual and true information.

7.1.3 Ownership

The MHOIS coordinator to be appointed should take the ownership of the overall MHOIS. The ownership includes the coordination among the MHOIS users, IT department at the IWK, the MHOIS consultant of the DOH and the MHOIS technical staff of the DoH. In addition to that, The MHOIS coordinator should also send a reminder to the clinicians and the administrative staff before the deadlines for submitting data and make sure that data is aggregated and audited before being submitted to DoH.

7.1.4 Accountability

The Mental Health Managers should take accountability in case clinicians or admin staff can not finish their work due to different reasons such as increased work load. The managers can look into their concern and make it convenient for them so that they can perform their MHOIS related work efficiently and timely.

7.2 Recommendations for the Department of Health, Nova Scotia

7.2.1 Transfer of data on Compact Disk (CD) instead of floppy disk

Currently all the hospitals within Nova Scotia and the DoH, NS do not have a secure system to send and receive data through internet using encrypting and decrypting techniques. Therefore the current practice is that the data is sent on the floppy disk from the central clinics to DoH. As floppy is not a reliable medium for transferring data, the compact disk (CD) is suggested to be used for transferring the data from the central clinics to the DoH. Usage of CD can save time, trouble and resources. The same CD can be used for the backup purpose as well.

7.2.2 A User-Friendly MHOIS Manual on the Computer Desktop

The current MHOIS manual available to clinicians and the administrative staff is available in the paper form. It was found out that the MHOIS users are less inclined to use the current paper based MHOIS manual. If the user-friendly MHOIS manual is provided on the desktop of the clinicians and the administrative staff, the intern believes it will increase the chances of being

referred from time to time by the MHOIS users. It is suggested that the MHOIS manual be developed as user friendly as possible. It should have the following features: an efficient index with good numbering scheme, a search feature and be in Adobe Acrobat Reader format. Also it should be updated regularly to reflect all the decisions made in the quarterly Provincial MHOIS Committee meetings. While updating, the new additions or modifications in the Manual must be indicated separately as well so that the users don't have to read the whole manual just for a few minor changes.

7.2.3 Redesign of the MHOIS form to spend clinical dollars on clinical information

Most of the clinicians at the IWK expressed their concern during the training session that they were being asked to collect information that has nothing to do with their primary job. Collection of non-clinical information by the clinicians can potentially affect patient care due to time constraint. As per the MHOIS manual page# 5, "It is the clinician's responsibility to complete and submit the MHOIS forms on a daily basis to report information on the clients they have seen that day". It is recommended that the top grey part of the MHOIS form attached as appendix-1 be completed by the administrative staff and the remaining fields may be completed by the clinicians. "Principal Clinician" field must be taken off from the grey part of the MHOIS form and the first space for the "Clinicians Present" is marked as the Principal Clinician. "Responsibility for Payment" field should be put in the grey area of the MHOIS form and it should be collected by the administrative staff. The clinician dollars must be spent to collect clinical data and similarly administrative dollars ought to be used to collect non-clinical data e.g. demographic and socio-economic information.

The intern believes that Socio-Economic Status information of parents/spouse/guardian of the patient referred to as "Other individual 1 and Other individual 2", in the top grey part of the MHOIS form, is not included at Cognos data cubes on the secure web site of the DoH. It is advised to stop collecting information that is not needed.

8.0 References

[1] MHOIS Manual

[2] IWK Health Centre Web Site, At a Glance, accessed on August 01, 2006
<http://www.iwk.nshealth.ca/allaboutus/index.cfm>

[3] IWK Health Centre Web Site, Coordinated Care, accessed on August 01, 2006
<http://www.iwk.nshealth.ca/allaboutus/index.cfm>

[4] IWK Health Centre Web Site, Mental Health and Addictions, accessed on August 01
2006, <http://www.iwk.nshealth.ca/allaboutus/index.cfm>

[5] IWK Health Centre Web Site, Emergency Services, accessed on August 01,
2006 <http://www.iwk.nshealth.ca/childmentalhealth/emergencyservices.cfm>

9.0 Appendix 1

The Standard MHOIS Form of the Department of Health, Nova Scotia

Mental Health Outpatient Record

CENTRAL CLINIC NUMBER & NAME				SATELLITE NUMBER & NAME			
EVENT TYPE		EVENT DATE		YEAR	MONTH	DAY	TIME OF DAY (24 hour clock)
CLIENT UNIT NO.		GIVEN NAME & INITIALS		SURNAME			
PLACE / MUNICIPALITY		POSTAL CODE		GENDER	YEAR	MONTH	DAY
TELEPHONE NUMBERS: HOME		WORK		EXT			
H.Q. NO.		PRINCIPAL CLINICIAN					
SOCIO-ECONOMIC STATUS							
CLIENT RELATIONSHIP		OCCUPATION TYPES		OCCUPATIONAL STATUS			
1 - Spouse	4 - Mother	1 - Prof./Man.	6 - Craft/Prod.	1 - Employed Full-time	6 - Disability Income		
2 - Father	5 - Guardian	2 - Clerical/Sales	7 - Unskilled	2 - Employed Part-time	7 - Retired		
		3 - Trans./Comm.	8 - NWFP	3 - Employed Seasonally	8 - Unemployed		
		4 - Service Ind.	9 - Other	4 - Homemaker	9 - Pre-School		
		5 - Primary Ind.	10 - No. info.	5 - Student	10 - No information		
RELATIONSHIP TO CLIENT		OCCUPATION TYPE		OCCUPATIONAL STATUS			
Other Individual 1		Client's Occupation		Client's Occupational Status			
Other Individual 2		Other Individual 1		Other Individual 1			
		Other Individual 2		Other Individual 2			
REFERRING AGENT (Complete Only On Assessments)							
1 - Nova Scotia Hospital Inpatient Unit		7 - Private Mental Health Practitioner		13 - Child Protection Services		19 - Friend	
2 - General Hospital Psychiatric Unit		8 - Physician		14 - Legal Services		20 - Self	
3 - General Hospital Other Inpatient Unit		9 - Drug Dependency Services		15 - Child Abuse Registry		21 - Other	
4 - Mental Health Out Patient		10 - Community Health Services		16 - Family Counselling Services		22 - KRRC Health Unit	
5 - Partial Hospitalization		11 - Homes for Special Care		17 - Clergy			
6 - Out-of-Province Health Services		12 - Schools		18 - Family		REFERRING AGENT	
PREVIOUS MENTAL HEALTH SERVICE (Complete Only On Assessments)							
1 - In-patient		2 - Out-patient		3 - Day/Night		4 - Private Mental Health Practitioner	
						5 - None	
						6 - Unknown	
INTERVIEWEES							
(Indicate number of Individuals)		Client		Spouse/Significant Other		Other	
SCHEDULED/UNSCHEDULED EVENT TYPE							
1 - Scheduled Regular		2 - Scheduled Priority		3 - Unscheduled Emergent		4 - Unscheduled Urgent	
						5 - Unscheduled Deferrable/Elective	
LOCATION TYPE							
1 - Mental Health Out Patient Clinic		4 - Psychiatric Unit		7 - Other Institution		10 - Telephone Only	
2 - Emergency Unit		5 - Other Unit		8 - School		11 - Court	
3 - Home		6 - Day/Night		9 - Work		12 - Other	
						Identify Hospital if Location 2, 4, 5 or 6:	
CREDITED SATELLITE							
CLIENT TYPE		1 - IN - Own Hospital		3 - DAY - Own Hospital		5 - OUT - Own Emergency	
		2 - IN - Other Hospital		4 - DAY - Other Hospital		6 - OUT - Other Hospital	
						7 - OUT - Own Mental Health Clinic	
RESPONSIBILITY FOR PAYMENT							
0 - DOH		2 - DVA		4 - Uninsured Resident		6 - Third Party	
1 - WCB		3 - Out of Province		5 - Federal		8 - Medically Unnecessary	
CLINICIANS PRESENT							
INIT.		I.D.		INIT.		I.D.	
(Initials & I.D.)							
PROGRAM							
(To be entered on repeat transactions when applicable)				SPECIFY:			
PRINCIPAL DIAGNOSIS							
				ADDITIONAL DIAGNOSES			
REFERRALS OUT (See Referring Agents Codes Above)							
CLOSURE REASON							
1 - Relocation		3 - Mutual Agreement		5 - Non-attendance		7 - Other Death	
2 - Withdrew Against Advice		4 - No Additional Benefits		6 - Suicide		8 - Assessment Only	
						9 - Other	

NOTES:

SIGNATURE: _____