

Construction of an Ideal Info-Structure in a
Pediatric Emergency Setting
&
“What is Health Informatics?” Definition Video

By

Mohammed Albakri
B00537570
albakri@cs.dal.ca

Performed at
IWK Emergency Department
&
The Sir Charles Tupper Medical Building
Dalhousie University

In partial fulfillment of the requirements of the Master of Health Informatics Program,
Dalhousie University

Report of Internship for the period May 2 – July 29, 2011

Date Submitted: August 12, 2011

Acknowledgments

I would like to thank my supervisors Dr. Brett Taylor and Dr. Katrina Hurley for their continuous support throughout the duration of these projects.

My sincerest gratitude goes out to the staff of the IWK Emergency Department without whom the vision project would not have seen the light of day.

I would also like to thank each and every person kind enough to lend us some of their valuable time to express their views and opinions on film, which allowed us to wrap up the video project.

Executive Summary

This report was written as part of an internship towards the completion of a Masters of Health Informatics Degree. Two separate projects were worked on over the course of the internship. The first of which dealt with the lack of an agreed upon optimal information structure in an emergency department setting. In order for a clinical department to make the most of funding opportunities it is wise to formulate an optimal vision of what improvements are more deserving than others of implementation if the funding is available. Through a series of surveys of administrative and clinical staff as well as patients and parents, the construction of a vision for an optimal information infrastructure was undertaken at the IWK Emergency Department. The project started off with a “Strawman” vision which was further shaped and morphed through the input of the major stakeholders to create a collective blueprint of what the optimal information needs are for the department.

The second project dealt with the clarification of the ambiguity surrounding the concept of health informatics. The definition of “Health Informatics” has proven to be an elusive concept. Through the interview of health informatics faculty members and alumni at Dalhousie University, a short video was produced that will contain testimonies from leaders in the field. This video will be disseminated through online portals such as the faculty website and YouTube to reach a larger audience and hopefully clear the opacity of the concept of health informatics.

Table of Contents

1. Introduction.....	5
2. The Organization	5
3. The Work Performed for the Internship.....	5
3.1 The “Vision” Project.....	6
3.1.1 Strawman Vision.....	6
3.1.2 Methodology.....	8
3.1.3 Presentation.....	8
3.1.4 Results.....	8
3.2 The “Video” Project.....	11
3.2.1 Raw Footage	11
3.2.2 Choosing Relevant Content	11
3.2.3 Storyboard.....	11
3.2.4 Editing.....	12
3.2.5 Screening.....	12
4. Relation to Health Informatics.....	12
4.1 The “Vision” Project.....	12
4.2 The “Video” Project.....	12
5. Discussion.....	13
5.1 The Vision Project	13
5.2 The Video Project	15
6. Conclusions.....	15
7. Recommendations.....	16
References.....	17
Appendix A: Vision Project Study Methodology.....	19
Appendix B: Video Transcript.....	21
Declaration.....	23

1. Introduction

The flow of information in a patient centric clinical setting is vital for the safety and well being of patients. In order to achieve an efficient and cost effective information structure in any health care facility, one must realize the immediate information needs of the major stakeholders. These may range from physicians, nurses, ward clerks, administrators or even to the patients themselves. Therefore the first project was structured as a qualitative cross sectional survey of all the stakeholders involved with the IWK Emergency Department. The goal of this study is to gain a better understanding of the information needs of the people administering care as well as the people receiving it in an emergency clinical setting. Once this information is obtained, this understanding will be used to shape a vision of the optimal information structure within a pediatric emergency department. This project was overseen by Dr. Brett Taylor. Dr. Taylor is an Associate Professor in the Departments of Emergency Medicine and Pediatrics at Dalhousie University.

The second project is an attempt to answer the question “What is Health Informatics?”. This project was initiated one year ago through videotaped interviews with Health Informatics teaching staff at Dalhousie University, alumni and medical professionals who use health informatics in their day to day practices. The resulting raw footage was edited to produce a 3 to 4 minute video. This video will be uploaded to the Health Informatics webpage as well as YouTube. This project was overseen by Dr. Katrina Hurley. Dr. Hurley is an Assistant Professor in the Department of Emergency Medicine at Dalhousie University.

Dr. Grace Paterson, the Interim Director of Medical Informatics at the Faculty of Medicine at Dalhousie University was to be overall supervisor for both projects. These two projects are henceforth to be referred to as the “Vision” project and the “Video” project respectively.

2. The Organization

The majority of the work involved with the vision project was conducted at the IWK Emergency Department. The IWK Health Centre is a multi-level care facility located in Halifax, Nova Scotia. Established in 1970, it provides primary, secondary and tertiary care to women and children in the Maritime Provinces and beyond [1].

The IWK Emergency Department is the only pediatric tertiary care emergency facility in the Maritimes [2]. A multitude of professionals are employed in the Emergency Department ranging from physicians and nurses to social workers and unit aides [3]. These professionals collectively care for approximately 28,000 patients annually [4].

3. The Work Performed for the Internship

The issue to be tackled during the internship was the absence of a cohesive vision of an optimal information structure in the IWK Emergency Department. The problem inherent with this lack of a proper vision has to do with optimal fund allocation, if funding is available. An unfortunate consequence of a non-existing vision is the loss of funding opportunities or the waste of resources. This could also lead to a situation where inadequate planning that is not inclusive of all aspects of

the department workflow is initiated. The objective was the construction of a vision that would allow the rapid adoption of effective procedures and technologies if the need for upgrading ever arose. This was to be achieved through a qualitative cross sectional survey of people directly involved with patient care in the Emergency Department as well as the patients themselves.

The second project dealt with the issue of creating a layperson's definition of the concept of Health Informatics. The problem here is the lack of general knowledge concerning the concept of health informatics. This ignorance may lead to the underuse of health informatics solutions that are available. This may also affect the role of health informaticians in the improvement of health care services in general. The proposed solution is to shed some light on the definition of the concept through a multimedia solution. This was to be achieved by conducting interviews with Faculty members, alumni and health care professionals who use health informatics within their own practices. These interviews would then be edited to produce a short video that would be later disseminated through online means such as the Dalhousie webpage for Health Informatics and YouTube.

The following is a detailed look at the actual work that went into fulfilling the internship requirements.

3.1 The "Vision" Project

The work performed on this project took many steps. These are detailed in the following points.

3.1.1 Strawman Vision

The initial step taken in the project was the construction of a preliminary vision. This vision was the culmination of ideas presented by Dr. Taylor and was to serve as a seed for new ideas. The Strawman vision was subsequently revised and rearranged by Dr. Paterson, Dr. Hurley and myself to form the initial vision that was to elicit discussions with the major stakeholders.

The details of the Strawman vision are as follows:

- Rapid patient registration either through the use of biometrics or smart cards. If the patient has no previous record in the institution, then a temporary registration file is generated. This profile will serve as the starting point for a permanent record with the hospital.
- The introduction of tablet devices for a paperless environment. These tablets would have access to all pertinent patient information in the department. The types of information displayed by the tablets can be customized according to each user's preferences.
- Tablets are provided to the parents of patients. This serves the purpose of allowing parents to enter any further data as well as providing an interactive method of education. Tablets may also be programmed to provide reminders for the parents for tasks that they can perform themselves (administering oral rehydration therapy or pain medication).
- Utilization of radio frequency identification (RFID) tags for patients and staff. These tags would be able to locate patients and staff at any given moment as well as logging staff

visits to patients throughout the care process. RFID tags also serve the purpose of starting and stopping specific patient timers, according to where the patient is located (waiting room, emergency department stretcher, radiology...etc.)

- The ability to access real time decision support through the tablet interface. This would be based on previous encounters from a personal, departmental, provincial and national point of view.
- The presence of visual indicators such as color changing fixtures that reflect the amount of congestion in the waiting room by changing colors according to an agreed upon designation. These indicators can be customized to reflect high level emergency situations as well.
- The introduction of a “smart board” in lieu of the traditional white board. This smart board will serve the same function as the white board but it will be updated automatically in real time by the data fed to the system through the tablets and RFID sensors.
- Upgrading the central area in the department with a surface computing apparatus for the distribution of general information and for educational purposes.
- Real time decision support would be available to administrative staff for monitoring and quality assurance purposes. The data would be presented in a collated format and this would serve as a performance indicator.
- An online portal for ordering and receiving the results of laboratory investigations and radiology procedures would be accessible through the tablet interface. This would be linked with timers for the monitoring of turnaround times. A critical result notification system would also be in place to notify the caregiver of any “panic” values found in these investigations immediately.
- Access to specific patient pathways will be possible through the tablet interface. These are pre-defined protocols that detail the care process of specific disease states or specific patients.
- An online portal linked with this system will be made available to patients. They can access their own information in a secure fashion from home as well as accessing educational material relevant to their conditions at a reading level they are comfortable with. Access to this portal can be shared with other caregivers such as immediate family members and family physicians.
- The emergency department system is to be linked with an early disaster warning system for immediate notification of internal or external disasters. This would create more time to formulate critical care plans and free up needed resources.
- The department’s system would also be linked with the Emergency Health Services system. A real-time video and audio feed from an incoming ambulance would be accessible to the staff at the emergency department as well as real time telemetry feeds. Another aspect would be the online support that can be given to the paramedic team as well as an ETA timer that can be accessed through the tablet.
- The trauma room will be fitted with high definition screens at eye level that would show all the relevant information needed in a trauma case. This information can be called up using voice commands. All trauma procedures will be captured in high definition video for quality assurance and educational purposes.

3.1.2 Methodology

After the initial step of forming a preliminary vision, the study methodology had to be drafted. This was to be provided to the Research Office to determine the need for a Research Ethics Board (REB) application. A copy of the methodology can be found in [Appendix A]. The nature of the project dictated that a qualitative rather than a quantitative approach be taken. In order for an unbiased view to be achieved, a cross sectional survey was employed. This was done by interviewing a number of people from all disciplines associated with an emergency care setting. Due to the nature of the emergency department workflow, not all stakeholders were interviewed. However, a healthy sample of each discipline was chosen for the study.

3.1.3 Presentation

In order for our vision to elicit discussions, it had to be drafted in such a way as to be presentable to the stakeholders in question. Initially, the vision was laid out in a PowerPoint format but it was found that staging it as a one on conversation was better as it put people at ease. Thus, the major points in our vision were rewritten as a series of questions that were discussed with the person in question. During the discussion, the main points of the initial Strawman vision were presented and the person being interviewed would provide his or her feedback along the lines of the following four questions:

- How useful is this idea?
- Do you think it's beneficial?
- Do you foresee any harm that may come to the patient or department from the implementation of this idea?
- Is this necessary?

In the end, 11 people in total were interviewed. 3 nurses, 3 physicians, 3 patients (parents), 1 administrator and 1 ward clerk. Two of the physicians interviewed had administrative responsibilities as well as their clinical ones. Due to the hectic nature of the emergency these interviewees were chosen based on their availability on any given day as their roles in the department were similar to their peers.

3.1.4 Results

The accumulative knowledge gained through the survey will be detailed in a report to be authored at a later time by Dr. Taylor, Dr. Hurley and myself. The following is a brief description of the responses obtained from the people surveyed regarding each point detailed in the initial vision.

Tablets: The overall consensus regarding tablets has been mostly positive. However, the main concerns included:

- Automation of data entry would leave little leeway for text based observations
- Theft of devices

- The availability of docking stations for charging
- Use of a touch screen while wearing gloves (availability of external keyboards)
- Use of device while visiting patients may be distracting and annoying to patient
- Camera qualities as well as individual photographic skills may limit the use of the photographic function.
- Availability of an EDIS like system for the monitoring and management of the emergency department.
- How to decide which parents get a tablet?
- Some parents won't be happy about monitoring their own children via tablet.
- Some parents may self diagnose via information from tablet and leave without being seen by a doctor or nurse.
- One suggestion received was to do away with tablets and make available multiple user stations strewn through the department that can be logged into and used.

RFID: Some expressed concerns over the RFID aspect. They were afraid it may lead to “Big Brother” scenarios such as tracking employee locations at all times and break times. One suggestion I received was to limit the use of RFID to patient areas and perhaps disable it during breaks. Another suggestion was to design it so that the location is acknowledged only when the staff member comes in close proximity to a patient. This gave rise to the question of when the staff member looks in on a patient in a non professional capacity (social visit). Others expressed no concern over employee surveillance as they thought staff members should be monitored for performance aspects.

Timers: This idea was met with overall acceptance but with a few suggestions:

- Changing the scheme from “waiting room timer” to “patient process timer”, (the time a patient spends in each phase of the care process i.e. waiting room, bed, radiology...etc.)
- Timer-based information is more pertinent to an administrative function.

Visual Indicators: Many felt that this function was not needed due to the following arguments:

- Congestion indicators can always be accessed through the individual mobile devices or can be seen on the Smart Board.
- If color coding is used, it will more or less always be in the “danger” color due to the high traffic going through the ED at any given time.

Smart Board: This concept was met with general approval with only one minor suggestion that is doing away with the interactivity functions and treating it as an information output source (like the flight time boards found in airports). Manipulation of information on this board would be done through the tablet or work station.

Blue Desk Area: Although this idea is appealing, many have questioned its necessity. The following came up while discussing this concept:

- The “blue desk” area is too social for the introduction of a highly technical device such as a surface computing device..
- The use of this area for teaching purposes.
- Using the surface area to make available any relevant literature.

- Due to the fact that there will always be people present around this area, it could be used as a notification portal for “panic” results.
- Limit the information available on the surface device to that of a public nature due to the high aggregation of personnel in the area.

Decision Support: Some felt that that the decision support aspect should be optional because it may impose on “the way they do things”. Others felt that too much support may detach from the “human touch” and may impose on scenario decisions.

Administrative Decision Support: This aspect of the vision elicited a unified response concerning privacy issues. The respondents expressed concern over the public availability of their performance measures. This should be addressed during the Q&A sessions to reassure people that individual performance indicators can only be seen by the individual whereas the indicators that are publicly available are a collation of performance evaluations with anonymity.

Specific patient Pathways: Some expressed that in addition to specific patient pathways, the availability of specific physician preferences is a good idea. The information that would normally be provided through regular daily meetings between physicians and nurses meetings should be available in a pathway format customized by each physician’s preference or practice.

Online Patient Portal: The concerns and suggestions I received regarding this issue are as follows:

- The duality of advice patients receive by allowing family physicians access to the patients’ care process in the emergency department.
- Modeling it like an online banking portal would be better in terms of privacy and sharing on information.
- Patients with that much access to their own sensitive data may compromise their own privacy.

Early Disaster Warning Systems: The concern expressed over this point had to do with the source of the early warning. It would only be useful if it were linked directly to a system such as 911-dispatch as opposed to an administrative system that may over exaggerate the severity of an external disaster.

EHS Connectivity: While many supported the aspect of accessing audio and video feeds from an incoming emergency vehicle as well as access to telemetric information regarding the patient, the aspect of online support was opposed due to the fact that EHS provide their own support staff to the paramedics. Another opposition point stemmed from the idea that Emergency staff cannot spare the time to monitor and support paramedic staff.

Trauma Room: The main concern expressed with this idea was the issue of consent regarding video capture of the procedures. Some felt that although they were uncomfortable with the idea of being videotaped, it was a necessary measure towards quality assurance. Others expressed concern over the ethical handling of video material and what security measures were in place to protect said materials.

General Issues: The following bullet points are issues that arose during discussions that do not fit under any of the questions we posed:

- Equal distribution of information among all ED staff (i.e. doing away with information silos and a “need to know” attitude).
- The issue of “who has access to what information”. Are the people taking care of a specific patient the only ones privy to that patient’s information? Or should the information be available to all ED staff regardless of their status in relation to the patient in question?
- The introduction of highly technological solutions may take away from the “human touch” or as some called it “the art of patient care”. It may also hinder teamwork.
- The resistance to technological solutions generally came from more experienced or senior staff members.
- All patients expressed that the more information the health professional has the better the outcome will be.

3.2 The “Video” Project

The final version of the “What is Informatics?” video took a multitude of steps to complete. These are detailed in the following.

3.2.1 Raw Footage

In the summer of 2010, Dr. Katrina Hurley conducted a series of interviews with Health Informatics and Medical School Faculty members as well as Alumni from the Health Informatics Program at Dalhousie University. These interviews were structured to answer specific questions regarding Health Informatics from both academic and clinical points of view. The raw footage from these interviews was given to me for the purpose of creating a short video compilation that focused on the definition of “health informatics.”

3.2.2 Choosing Relevant Content

The interviews conducted by Dr. Hurley were extensive in regards to many important aspects of health informatics. The desired end product was specific to what constituted a definition of health informatics from each interviewee’s point of view. The initial step was to splice the raw footage into small clips each containing the parts that were relevant to the definition. The resulting clips were reviewed by Dr. Hurley and me to choose the most highly relevant definitions. This selection was based on content as well as the video and audio quality. The chosen clips were then transcribed to ease the process of storyboarding. This transcript can be found in [Appendix B]

3.2.3 Storyboard

After the relevant content was chosen, the storyboard had to be agreed upon. A series of meetings ensued where Dr. Hurley and I decided on an appropriate storyboard that fulfilled the initial question of “What is Health Informatics?”.

3.2.4 Editing

During the editing phase a number of applications were employed to put together the final version of the short movie. The primary software used was a video editor called Corel Video Studio Pro X3. Other elements of the video were edited using Microsoft Movie Maker, Microsoft PowerPoint and Blueberry Flashback Pro Recorder.

3.2.5 Screening

After the initial editing phase, two versions of the video were created. These two short clips were shown to Health Informatics Faculty, Alumni, Students as well as people with no affiliation with health informatics. This was done in an effort to garner feedback about the videos. Any useful suggestions were to be used to further hone the final version of the video before final dissemination. The majority of the reviews we received were positive in regards to the video’s message. The final version was delivered to Dr. Hurley for future dissemination. The general reception of the video was positive.

4. Relation to Health Informatics

4.1 The “Vision” Project

The aim of this project is to provide a cohesive vision as to what constitutes an ideal information structure in a medical facility that provides emergent care. In order to achieve this goal one has to take into account many aspects of health informatics. The majority of processes discussed within the proposed vision such as the automation of data entry, rapid patient registration and identification and the use of Smart Boards were closely related to information capture, visualization and flow. Some aspects of the vision such as the introduction of real time decision support and customized patient educational material depend on concepts gained through a proper grasp of knowledge management.

The majority of responses gained through the survey displayed an innate bias towards the use of health informatics tools as solutions for information needs in the department. This indicates a future where the adoption of such solutions is more readily accepted and adhered to.

4.2 The “Video” Project

The definition of health informatics as a discipline is elusive to many people. This project attempts to define it by employing the collective knowledge of some of the experts in the field. Ultimately

this definition will be provided to the general public in a way that can resonate with them and provide an easy to understand “elevator” definition of the concept. This comprehension will hopefully facilitate the spread of health informatics solutions more readily in the future. This will also hopefully cement the role of the health informatician in all aspects of health care delivery improvement.

5. Discussion

5.1 The Vision Project

Upon reviewing the multitude of suggestions garnered through surveying a sample of the major stakeholders in the IWK Emergency Department, a literature search was conducted to see if any of them had any feasibility in a functioning emergency department. A few of these results will be detailed below.

- A study published in 2008 found that an automated white board in the emergency room enhanced communication, optimized work flows and a better continuity of care. The study also stated that the use of an automated white board in an emergency setting allowed for better quality assurance measures as well as granting better capabilities for research based projects [5]. The overall findings in this study agree with the suggestions received through the survey. Another aspect supported by this study was the fact that the data relayed through the Smart Board was automated, similar to what the suggestions stated.
- A study published in 2007 tested the effects of using RFID technology in an emergency setting. The study found that through the tagging of patients with RFID chips the overall survival rate of their patients increased by an astounding 25%. The use of RFID technology also showed a reduction of patient wait times as well as treatment times by as high as 45% and 10% respectively. Overall, the study showed that by introducing this relatively cheap technology into an emergency setting, workloads decreased and patient benefits and satisfaction increased noticeably [6]. The findings detailed in this study made an extremely strong case for the use of RFID technology in the emergency department. The results obtained by the research team supported the suggestion while none of the concerns found in the survey results were mentioned.
- A study published in 2000 studied the effect of formulating specific care plans for patients who frequently visited the emergency room at St. Paul’s Hospital in Vancouver. The 24 patients included in the study suffered from a wide host of afflictions, ranging from the physiological to chronic conditions. The researchers formulated custom care plans dealing with each of the patients’ specific ailments and applied them over a period of 2 years. The results indicated an overall reduction in the number of times each patient visited the emergency room once the care plans were initiated [7]. The specific finding detailed in this paper supported one of the key points in the initial Strawman vision. This was the availability of specific patient care plans for patients who frequently visit the emergency department.
- A study published in 2003 found that overcrowding in emergency rooms may threaten patient safety. The paper also suggested that one reason for overcrowding may be due to immediate external disasters. To overcome this threat, the researches proposed forming a link between emergency room systems and early warning systems. This will allow the deployment of disaster plans in a more time efficient manner thus reducing the safety

threats posed in such high pressure situations [8]. Although there were no studies to corroborate the proposed solution, it agrees with the suggestion made that in order for this configuration to function properly, it must be linked with credible sources of early warnings such as law enforcement systems.

- A study published in 2010 surveyed a number of physicians and patients about their attitudes towards using technological tools during patient visits. The majority of patient responses ranged from positive to very positive. Less than 4% of participants felt that the use of computers during their visit had a negative effect. The overall findings suggest that the use of technological tools in the physician's office had positive effects [9]. Another study showed that the actual architecture of the examination room in terms of the placement of technical equipment such as computer monitors or tablets may greatly affect patients' attitudes towards their use by physicians [10]. The results of this study are more than adequate to address the concerns detailed in the survey results. This finding strongly supports the deployment of technological solutions in the emergency department even in patient centric scenarios.
- To combat the theft of devices, many manufacturers have introduced security measures that allow users to manipulate mobile devices remotely. Functions such as remote location of devices, remote memory wipes and even activation of alarms on the device are now available for many of the commercially available mobile devices [11, 12, 13, 14]. The availability of these services opposes the concern of theft of devices from the department and supports their deployment much like the previous point.
- All patients interviewed for this project felt that the more information their caregiver had access to, the better their outcomes would be. This reflects the fundamental theorem expressed by Charles Friedman in a paper published in 2009. In this theory it was stipulated that a person working with an information resource is better able to perform than the same person working unassisted [15]. Again, this correlation is strongly indicative of the beneficial aspect of employing technological solutions in a patient centric environment.
- A paper published in 2003 studied the effects of capturing trauma room procedures on video. The study found that capturing trauma room proceedings was effective in improving quality, as a feedback mechanism and a physician training tool. This study was conducted at the University of Maryland Trauma Center and spanned 11 years. A particular benefit gained from the surveillance of the trauma room was the ability to develop a task/communication algorithm used to train health care providers on the proper technique for esophageal intubation [16]. Although the findings of this study showed the benefits of implementing such a process, the real concern here is a legal one. This should be further addressed through a proper legal channel to determine the actual feasibility of the concept.
- A study conducted in 2000 exhibited the benefits of using a real time mobile telemedicine system for ambulance support. Aside from the lab testing, the system was used during the actual transfer of 6 patients, all suffering acute ischemic stroke. The data transferred to the stroke specialist proved beneficial in the early treatment of all cases. By initiating treatment en route, the time to a definite diagnosis was greatly reduced and all patients fell well within the treatment window of opportunity [17]. Although the technical aspects are promising, the concerns surrounding this point are operational in nature. The availability of an existing support structure for paramedic teams, coupled with the fact that many emergency health care professionals exhibited a degree of reluctance to offer any additional support renders

this solution farfetched. In order for this to be implemented, key work processes must be integrated between both departments. This might prove to be extremely elusive.

- The majority of the findings obtained from the literature search proved to be supportive of both the Strawman vision and the survey results. A few were found to be opposing. These mainly had to do with legal or workflow related issues. Resolving such issues involves lengthy integration processes that are conceptually far from the scope of this paper.

5.2 The Video Project

Although the majority of the work performed on this project was of a technical nature, for the purposes of this report the emphasis must be on the message the video conveys. While some of the interviewees gave straight textbook definitions for the concept of health informatics, the overall message garnered from the video was one of advocacy of the functionality of the concept and its use as a tool for improving the delivery of health care. Many believed that the concept of health informatics, if applied correctly would pose a profound change in the practice of medicine in the future.

Upon initial screening of the video to a test audience, it was noticed that people with health informatics affiliation found the video entertaining if not greatly informative. On the other hand, people who had no health informatics affiliation found the video both intriguing and informative.

6. Conclusions

The internship process proved to be a valuable learning experience for the author. The internship included learning new skills as well as putting old skills to work to fulfill each requirement. Some conclusions drawn from the vision process include:

- A lot of work went into forming the initial preliminary vision. After awhile one would grow extremely fond of the ideas contained in said vision. During the discussion phase however, some of the ideas were not met with the same level of enthusiasm. This tended to create a feeling of animosity towards the interviewee. One must always be objective and keep an open mind when presenting in order to avoid biases and hostility.
- Even though there is a fondness of the ideas contained in the vision to be presented, the method of discussion should never take the form of a sales pitch. These ideas are to be presented as a means for sparking discussion and not as a “final solution”.
- The author gained a newfound respect for the people involved in pediatric emergency care after interviewing them and observing how they carry on the process of patient care. Their’s is not an easy job.
- The process of discussing the vision ideas with the emergency department staff further affirmed the notion that more experienced people are more resistant to changes in work processes.

As for the video project, the main conclusion drawn from that process is that trying to define a concept by interviewing experts in the field is an arduous task. Each expert has something to add and this will result in an abundance of information. Sifting through this information and trying to create a simple definition is a difficult and time consuming process.

7. Recommendations

Although the initial survey has been completed, a number of steps still remain in the overall scheme of the vision project. The next suggested step to be taken is the publication of the results in an article. This article should be disseminated through scholarly journals as well as presented through conference proceedings. The second recommendation is the production of a short video containing a mock up of the ideas gained through the survey. This video should be disseminated through online means such as YouTube and the feedback should go towards further refining the final vision.

As for the video project all suggestions are of a technical nature and have to do with the initial video and audio capture of the raw footage. A portion of the initial raw footage had to be discarded due to background noise and shooting angles. If this venture were to be undertaken again in the future, it would be prudent to address these issues to maximize the amount of viable raw footage.

To better utilize the power of social media, it would be prudent to create a Facebook page dedicated to health informatics. Both videos mentioned above may be posted to this page to reach a larger audience and to garner more comments from a wider range of people.

References

- [1] *About Us*. (2009). Retrieved July 27, 2011, from IWK Health Centre:
<http://www.iwk.nshealth.ca/index.cfm?objectid=83035FEC-96DF-D496-5C20716B6DFB391E>
- [2] *Our Team*. (2009). Retrieved July 27, 2011, from IWK Health Centre:
<http://www.iwk.nshealth.ca/index.cfm?objectid=89137F53-F3CF-3B37-036EE2B29054C548>
- [3] *Who We Help*. (2009). Retrieved July 27, 2011, from IWK Health Centre:
<http://www.iwk.nshealth.ca/index.cfm?objectid=89137F34-F71D-4965-79BAC8A3B43BDF5D>
- [4] *Your Visit*. (2009). Retrieved July 27, 2011, from IWK Health Centre:
<http://www.iwk.nshealth.ca/index.cfm?objectid=5757494D-FEF4-C921-95A5F2F9192AD4BF>
- [5] Aronsky, D., I. Jones, et al. "Supporting Patient Care in the Emergency Department with a Computerized Whiteboard System." Journal of the American Medical Informatics Association **15**(2): 184-194.
- [6] Kuo, F., C.-J. Fu, et al. (2007). The implement of RFID in emergency medicine. HEALTHCOM 2007: Ubiquitous Health in Aging Societies - 2007 9th International Conference on e-Health Networking, Application and Services, June 19, 2007 - June 22, 2007, Taipei, Taiwan, Inst. of Elec. and Elec. Eng. Computer Society.
- [7] Pope, D., C. M. B. Fernandes, et al. (2000). "Frequent users of the emergency department: a program to improve care and reduce visits." Canadian Medical Association Journal **162**(7): 1017-1020.
- [8] Trzeciak, S. and E. P. Rivers (2003). "Emergency department overcrowding in the United States: an emerging threat to patient safety and public health." Emergency Medicine Journal **20**(5): 402-405.
- [9] Lelievre, S. and K. Schultz (2010). "Does computer use in patient-physician encounters influence patient satisfaction?" Canadian Family Physician **56**(1): e6-e12.
- [10] Fonville, A., E. K. Choe, et al. (2010). Exploring the use of technology in healthcare spaces and its impact on empathic communication. Proceedings of the 1st ACM International Health Informatics Symposium. Arlington, Virginia, USA, ACM: 497-501
- [11] Apple Inc. (2011). *Find my iPad*. Retrieved 2011, from Built-in Apps:
<http://www.apple.com/ipad/built-in-apps/find-my-ipad.html>
- [12] *Intel Anti-Theft Technology*. (2011). Retrieved 2011, from Motion Computing:
http://www.motioncomputing.com/choose/spec_intel_AT.htm
- [13] Research in Motion Limited. (2010). *Mobile Security (Anti-theft)*. Retrieved 2011, from Blackberry App World: <http://appworld.blackberry.com/webstore/content/1305>
- [14] Zobo Technologies. (2011). *Anti Droid Theft*. Retrieved 2011, from Anti Droid Theft:
<http://www.antidroidtheft.com/>

- [15] Friedman, C. P. (2009). "A "Fundamental Theorem" of Biomedical Informatics." Journal of the American Medical Informatics Association **16**(2): 169-170.
- [16] Mackenzie, C. F. and Y. Xiao (2003). "Video techniques and data compared with observation in emergency trauma care." Quality and Safety in Health Care **12**(suppl 2): ii51-ii57.
- [17] Xiao, Y., D. Gagliano, et al. (2000). "Design and evaluation of a real-time mobile telemedicine system for ambulance transport." J. High Speed Netw. **9**(1): 47-56.

Appendix A: Vision Project Study Methodology

- **Introduction**

Opportunities to obtain funding for improvement arise infrequently and are snatched up rapidly. Sometimes, in the frenzy inherent in the process, funds are misused or wasted. This situation results in wasted opportunities that may have otherwise been taken advantage of to strive towards general improvement. The betterment of an info-structure is no different in this regard. If one has no clear goal or “vision” of what the optimal setup of an info-structure should be, funding, if granted may be misused and wasted. Therefore, we are striving to construct a vision of what our optimal information structure would look like. This is in no way a list of goals but rather a general overview of what we, as a group/team envision our department to be in terms of information management and flow.

- **Purpose**

The purpose of this undertaking is multi-tiered. First of all, we aim to provide a clear picture of an optimal information structure in an emergency department setting according to the people on the ground. This will eventually lead to an overall industry standard of what info-structure best suits the needs of the ultimate end users in any emergency department. Secondly, a clear picture of an efficient info-structure would facilitate funding allocations in an optimal fashion when the time arises.

- **Methodology**

An undertaking such as this is more qualitative than quantitative in nature and must be conducted through surveys and consensus all under a qualitative umbrella.

- ***Study type***

The study is a qualitative cross sectional survey of health care professionals including emergency physicians, nursing staff, clerks and health informaticians. The survey will also include patients as they are the true beneficiaries of any health care system. The survey will strive to draw a vision of ideal infostructure and information management practices in a pediatric emergency setting.

- ***Data sources***

The data collected will be from surveying and/or consulting with all the key disciplines in the patient care chain. These will include physicians, nurses and clerks for their immediate exposure to the emergency environment, as well as administrative staff for their knowledge of managerial and financial matters. We aim to include patients and their families in the survey. We anticipate that their roles as caretakers will be invaluable in shaping an ideal user friendly info-structure.

- ***Data analysis***

The collated data will be sifted through and scrutinized by team members to discern what is feasible/applicable/useful. A synthesis of the data collected will be constructed by the team

members. Decisions as to what to include and exclude will be made by consensus, with contributions from all members.

- ***Knowledge Translation / Transfer***

The end result will be disseminated through a variety of channels. Firstly, we will seek the publication of an article in scholarly journals. Secondly, we aim to present our findings in academic conferences. Thirdly, we aspire to use the collated vision and produce a short movie containing a mock up of what the ideal setting is. This video presentation will be distributed through YouTube to reach a larger audience. We can use any positive feedback from the public showing to inspire change in the current redundancies the industry suffers from.

- **Potential Impact**

We hope that the results of this study will have a significant impact on the health care community. As an industry, health care may benefit from our study to set better standards for health care info-structures. As for health care professionals, the study will illuminate better ways of improving health care through technology. Administrators will have the proper knowledge to appropriate funding more wisely.

Through our study, we aim to expose the public to the underappreciated discipline of health informatics. We hope our findings shed some light on the role and importance of health informaticians in shaping better health care info-structures and ultimately better patient outcomes.

- **Summary**

In our line of work, funding rolls around only every so often. To maximize on obtaining and properly allocating it, one must have a clear vision of what the funding must be spent on and what to avoid wasting valuable resources on. A qualitative analysis is needed to obtain a collaborative picture for all people involved in the workflow process. What is being proposed here is not the vision of one person or even the vision of an appointed task force. It is rather the collective vision of a whole team of people working together for the common good of the department and the patients we serve.

Appendix B: Video Transcript

Dr. Brett Taylor: Health Informatics is not a thing; it's a way of looking at the world.

Dr. Ray LeBlanc: It's not just about what happens in the doctor's office anymore.

Dr. Grace Paterson: I think the definition that I like best for medical informatics is Chuck Friedman's fundamental theorem of medical informatics which states that using information technology helps a person extend their cognitive capacity so it makes them more able to do their jobs. So health informatics is people working with information technology to better enable them to do their work.

Dr. Noni MacDonald: Most of the way I've seen it defined is the intersection with health information, computer science and health care and health systems but I think that's very linear and very narrow in what it is. For me what Health Informatics is **really** is about is how do we take all of these tools and have **everybody** able to manage health, health care systems and their own personal health in a better way. That's whether you're the mayor of the city, whether you're the Dean of Medicine, whether you're the CEO of one of the biggest health organization or you're John Q Public who's just cut their finger. That's what it's all about.

Dr. Ray LeBlanc: If you look at the average patient, the average patient changes hands so to speak maybe as many 3 point, I forget the number is but it is somewhere between 3 and 4, times on an admission. Every one of those would be so much safer with a robust information platform. That's what health informatics is all about to me.

Dr. Ajantha Jayabarathan: Although it is very tempting to think "gosh I could scribble this down", remember you just said scribble. And most of it is scribble and to think that you have to decipher a medical document which is a scribble that is unintelligible. I think for the years the system has compensated for how busy and overworked we are and I think it is time for us to stop and consider whether an investment of our time is going to be an investment in this system and an investment in patient safety.

Dr. Ray LeBlanc: it's kind of that whole envelope of... instead of a stack of charts like this, it's about having it sitting there electronically – easy access, easy transfer. That's kind of how I think of it anyway

Mr. Amir Feridooni: Why my bank transaction it goes from here to somewhere for like two/three minutes and my health record from Dartmouth to Halifax takes maybe a months to get there.

Dr. Noni MacDonald: You've got to get over the paper and pencil route of doing everything. We **have** to be able to use information in **every single thing we do**.

Dr. Raza Abidi: It is just humanly impossible for health professional to have all that information at their fingertips and all the knowledge about new products and treatments and any other interventions that are out there available to them. It is at that point that health informatics becomes a support mechanism to the health care professionals.

Dr. Noni MacDonald: health informatics is **not about the health system period**. It's much bigger than that.

Dr. Brett Taylor: I see communication technology in particular and informatics as a discipline applied on top of that technology, as a profound changer of the way we practice medicine in the next ten years.

Dr. Ajantha Jayabarathan: Health Informatics for me is a very powerful tool that is very fast becoming my best friend.

Dr. Noni MacDonald: If you are not becoming informatics savvy, you are dinosaur. It's over.

Declaration

I, the undersigned, hereby declare that the work contained in this report is my own original work and has not previously in its entirety or in part been submitted at any university for a degree.

Mohammed Albakri

Date