

Final Report for the
Emergency Department Front End
Study to Improve Patient Privacy and
Patient and Visitor Flow

University of Michigan Health System

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Executive Summary

The current processes and layout of the Emergency Department (ED) at the University of Michigan Health System (UMHS) cause reports of privacy complaints. Patients have complained about the spoken exchange of information being overheard in the public reception and patient care areas. These violations can lead to breaches of privacy regulations. The risk of these violations will be reduced by improving the patient flow in the front end, which includes the check-in desk, NASA exam rooms, and the waiting room.

The Emergency Nurse Manager of the Emergency Department asked our team to observe and analyze the processes, flow, and layout of the front end in the ED to make suggestions for improvement that will result in better patient privacy. Our team completed these observations and analysis and has developed recommendations to improve patient privacy.

Background

Most patients received in the ED enter through the main ED entrance. These patients are immediately triaged and assigned a priority level from 1 to 5 by a nurse at a podium. The patients are then directed towards the front desk where a clerk collects their personal information. In the NASA area, a nurse assesses the patient's condition. The patient is then directed to the waiting area containing approximately 43 seats with room for more than 10 wheel chairs and a desk for a unit host who is responsible for giving directions, assigning visitor passes, and addressing visitor needs. A "runway" nurse is responsible for the hourly reassessment of patients who are in the waiting room.

During the busiest hours, the waiting area is close to capacity of 43 people and the front desk area is over crowded. However, the security personnel office is enclosed and set apart, which hinders their ability to direct the patients towards their final destinations and to screen the people entering through the ED doors.

Methodology

This project was performed in the following phases: observations, shadowing, interviews, quantitative data collection, researching other hospital EDs, and analysis of information.

Observations

To better understand staff roles at the hospital, the team observed the activities of the ED front end. We observed patient privacy issues, flow problems, and the waiting room capacity.

Shadowing

The next step completed was shadowing the nurses. Our client provided the official job descriptions for the front end nurse staff. Each member of the team followed a NASA nurse or podium nurse for two hours to understand the patient-nurse interaction.

Interviews

The team interviewed key hospital staff regarding privacy and security. Within these interviews, we explored the current privacy complaints, the relevant numerical data that could quantify the privacy complaints, the possibility of collecting waiting room visitor data and the role of security.

Quantitative Data Collection

Our team received the following quantitative data regarding the ED front end:

- Patient arrival times from the calendar year 2004 extracted from the Centricity Patient Information System. We determined arrival patterns from this data.
- Written privacy complaints from January 2005 through October 2005.
- Patient satisfaction survey results from January 2004 through September 2005.
- Architectural map of the entire ED.

Our team also collected and facilitated further data collection including:

- Waiting room head counts collected by the unit hosts for four full days.
- Security activity tracking including the number of people that were questioned by Security personnel when entering the ED.
- Sound levels around the reception desk measured by decibel meters under different conditions.
- Dimensions of the ED front end.

Researching Other Hospital EDs

The team observed two other Emergency Departments layouts on October 9th, 2005. The two hospitals observed were St. Joseph Hospital in Ann Arbor, Michigan and St. Joseph Hospital in Saline, Michigan.

Analysis of Information and Recommendations

The team examined results from the observations, shadowing, interviews, quantitative data collection, and researching other hospital EDs. From this analysis of information, the team developed recommendations to improve the patient flow and privacy at the front end of the ED.

Findings, Conclusions, Recommendations, and Expected Outcome

Our team acquired large amounts of data by following the above methodology. With that data we conducted studies of the privacy survey data, public relations, sound levels, visitor policy, waiting room, security, layout, and pediatric patients. The findings, conclusions, recommendations, and expected outcome for each of these eight topics are found in the table below:

Table 1: Summary of Findings, Conclusion, Recommendations, and Expected Outcome

	Findings	Conclusion	Recommendations	Expected Impact
Privacy Survey Data	ED patient's concern for privacy when giving personal information satisfaction score < 90.	Problem with patient's perception of their privacy in the front end of the ED.	Team further analyzed sound levels, layout, flow, security, and visitor policy.	Increase privacy of patients and improved quality of patient care
Public Relations	Approximately 20% of the patient and visitor population is converging at the podium contributing to privacy breaches at any time.	The current location of the podium increases risks for privacy breaches and increases nurse time spent on answering public relations questions.	Instead of the podium, an information station should be placed in the reception area and the nurse be moved behind the desk.	Reduced number of privacy breaches. Better utilization of nurse working time. Less confusion of public relation positions.
Sound Levels	Sound levels when a patient spoke towards the podium were 3-4 dB higher than when a patient spoke towards the check in desk.	Auditory breaches of privacy are less likely to occur at the check-in desk.	Installing sound absorbing panels at the reception and curtain partitions for exam opening to the NASA exam rooms.	Auditory breaches of privacy reduced in the reception and NASA area. Perceived privacy breaches decreased.
Visitor Policy	Observation of many violations to the UH-ED current visitor policy. (see appendix G)	The visitor policy needs to be better enforced by the staff.	Distribute pamphlets with summary to the visitor policy and display informative signs.	Fewer violations of the visitor policy. Improved visitor flow.
Waiting Room	Unstable pattern of number of visitors in the waiting room. Visitors add to human flow in front end by walking between waiting room, bathroom, and vending.	Visitors add to the traffic near the front desk. Visitor flow needs to be controlled, especially during peak times.	Maps showing the location of the bathroom, vending machines, and phones should be distributed.	Visitors better educated about hospital layout. Visitors will approach front desk and podium less often. Chances of breaches reduced.
Security	Only 4% of visitors were screened by security as they entered the ED.	Security should have a more visible role in the front end.	Visitor stickers should be issued as they enter the ED. Further studies into the role of security.	Reduced pedestrian traffic. Clarification of visitors in the ED through visitor stickers.
Layout	Measurements in reception area and mapping of patient and visitor flow.	More opportunities for breaches of privacy and for the nurse to be asked a public relations question.	New layout with the podium removed and an information desk added by the front door.	More efficient flow. Information more readily available. Less congestion in the check-in process.
Pediatric Patients	Average of 27.1% of patients that arrive into the ED front end are pediatric patients.	Elimination of pediatric patients in the front end would reduce the total volume by one third consistently throughout the entire day.	Sending pediatric patients directly to CES after triage and check-in at reception.	Reduced volume in NASA area. Improved patient flow reducing congestion. Increase throughput in NASA.

Introduction

The Emergency Department (ED) at the University of Michigan Health System (UMHS) has experienced over 200 patient visits a day in the last year, totaling more than 72,000 visits. In addition, the current triage, check-in, and assessment process followed in the ED had received patient privacy complaints. These complaints were due to the spoken exchange of information in the public reception and patient care areas. The legal representatives from the Privacy Office have identified the patient information collection in the ED reception area as a violation of hospital and the Joint Commission on the Accreditation of Healthcare Organizations (JCAHO) regulation. Consequently, the patient flow in the front end areas needed to be improved. The front end area includes the check-in desk, NASA exam rooms, and the waiting room. The purpose of this project was to improve patient privacy by observing, analyzing, and modifying the patient flow and layout of the front end. The purpose of this report is to present the methods, findings, conclusions, and recommendations from the project.

Goals and Objectives

To determine a method that reduces patient privacy breaches and to improve the flow and layout of the front end area, the student team has completed the following tasks:

- Observed and interviewed nurses and security personnel working in the Emergency Department's front entrance.
- Mapped the human flow in the ED front end.
- Measured the sound levels and physical space in ED front end.

After observations and data gathering were completed, our team has developed recommendations to:

- Improve patient privacy and satisfaction.
- Improve patient/visitor flow.
- Redesign the front end layout.

Background

Most patients received in the ED enter through the main ED entrance. These patients are immediately triaged and assigned a priority level from 1 to 5 by a nurse at a podium. The patients are then directed towards the front desk where a clerk collects their personal information. In the NASA area, a nurse assesses the patient's condition. The patient is then directed to the waiting area containing approximately 100 seats and a desk for a unit host who is responsible for giving directions, assigning visitor passes, and addressing visitor needs. A "runway" nurse is responsible for the hourly reassessment of patients who are in the waiting room.

During the busiest hours, the waiting area is full and the front desk area is over crowded. However, the security personnel office is enclosed and set apart, which hinders their ability to direct the patients towards their final destinations and to screen the people entering through the ED doors.

Key Issues

The following key issues have led to the problem under investigation:

- Patient privacy regulations are being breached in the ED front end.
- Due to increased patient volume and limited capacity, the front end area is congested with excessive patient and visitor traffic.
- Space is the primary constraint within the ED.

Project Plan

To improve patient privacy and flow of the front end, the team examined the activities in the Emergency Department front end. The primary parties that were involved in this project include patients, family and friends of patients, clerks, technicians, nurses, physicians, and security personnel. University Hospital departments involved in this analysis were the ED, the security department and the legal offices.

Project Scope

The project included analysis of:

- Activities in ED front end.
- All patient and visitor flow in front end.
- Flow from when the patient steps in the ED until the patient reaches an exam room.
- The number of times and the places of patient confidentiality breach.

The project excluded analysis of:

- Patient wait time and flow in the main ED treatment area and exam rooms.
- Cost of inefficient staff and material flow.
- Role of security in the front end.
- Major architectural changes.

Recommendations resulting from this analysis only include changes that are manageable at this point. These types of changes include basic redesign of the reception, NASA and waiting room areas and minimal construction.

Approach

This project was performed in seven phases: observations, shadowing, interviews, quantitative data collection, analysis of information, researching other hospital EDs, and recommendations.

Observations

To better understand staff roles at the hospital, the team observed the activities of the ED front end. We observed patient privacy issues, flow problems, and the waiting room capacity. Observations were completed from September 25th, 2005 to October 2nd, 2005 during four two-hour periods. The team observations include the following:

- Conversation between podium nurse and patients clearly overheard in reception and NASA area.
- Podium nurse frequently interrupted with customer service questions.
- High volume of traffic back and forth in front of the reception area.
- A trend in high arrival times at specific periods of the day and week.
- Visual and auditory breaches of patient privacy in the NASA exam rooms.
- No visible presence of security or the ability to manage the visitor population.
- Patient flow times are best measured by the Centricity Patient Information System.

Shadowing

Our client provided the official job descriptions for the front end nurse staff. Each member of the team followed a NASA nurse or podium nurse for two hours between October 2nd, 2005 and October 10th, 2005 to understand the patient-nurse interaction.

During the shadowing, we found the following issues:

- Nurses deviate from their specific job descriptions by answering public relations questions.
- Nurses contribute to patient and visitor traffic by answering public relations questions.
- Nurses perceive space constraints and staffing roles as major problems in the ED.

To distinguish between perception and fact, our team has conducted quantitative data collection and analysis.

Interviews

The team interviewed the following key hospital staff relating to privacy and security:

- Lou Ann Rosekrans, Compliance Specialist, Compliance Office on October 12th, 2005
- Robert Owens, Analyst, Customer Satisfaction and Data Management on October 12th, 2005.
- Perry Spencer, Security Officer, Security Services on October 13th, 2005.
- Harold Ward, Manager, Emergency Department Clerical Services on October 19th, 2005.
- Edward Karls, Manager, Customer Satisfaction and Data Management on October 21st, 2005.
- Samir Karim, Senior Architect, Facilities Planning and Development on November 2nd, 2005.

Within these interviews, we explored the current privacy complaints, the relevant numerical data that could quantify the privacy complaints, the possibility of collecting waiting room visitor data and the role of security.

Quantitative Data Collection

Our coordinator extracted existing data from the Centricity Patient Information System. This data included patient arrival times from the calendar year 2004 with a sample size of

73,000 total visiting patients. We determined the arrival patterns and the times of highest patient volume in the front end from this data by using Microsoft Excel to generate a graph.

The Compliance Specialist provided the details about how privacy complaints are received through phone calls and written complaints. She also referred us to the Customer Satisfaction Analyst and the Customer Satisfaction Manager for numerical data. This data included the number of written privacy complaints and the dates on which they occurred from January 2005 through October 2005 with a total sample size of 1,756. The Customer Satisfaction office also provided the team with quantitative results from the patient satisfaction survey relating to the ED. This data was taken from January 2004 through September 2005 with a sample size of 1,874.

The Senior Architect supplied an architectural map of the entire ED in an AutoCAD diagram.

When looking at the number of people in the waiting room and the flow of the overall population, we observed that only a fraction of the volume was patients. However, the Centricity data only tracks the number of actual patients at a particular time. Therefore, we asked the Manager of ED Clerical Services to facilitate a data collection to be conducted by the unit hosts. The unit hosts in the waiting area collected the number of people in the waiting room on the hour and whether a runway nurse was present for four days from October 26th, 2005 through October 30th, 2005.

The Security Officer in charge of the ED provided job descriptions and knowledge of the current activities of the two security officers in the ED. He also expressed difficulty in monitoring the performance of the security personnel. To determine the effectiveness of security in the ED, we collected data on the frequency of activities related to managing the visitor population and protecting patient privacy. This data was collected four times for two hours each over the week of October 30th, 2005 through November 5th, 2005. The goal of studying the security officers was to determine if they could take on a larger role in protecting patient privacy by directing visitor flow.

Using decibel meters, the sound levels have been measured in the widest radius around the reception desk under different conditions. This data was taken on November 12th, 2005 and was used to determine if a sound absorbing material would be beneficial in the reception area. Our team also took additional measurements of the ED front end physical dimensions on October 30th, 2005.

See Appendices A through D for the data collection forms.

Researching other hospital EDs

The team observed two other Emergency Department layouts on October 9th, 2005. The two hospitals observed were St. Joseph Hospital in Ann Arbor, Michigan and St. Joseph Hospital in Saline, Michigan.

Analysis of Information and Recommendations

The team examined results from the observations, shadowing, interviews, quantitative data collection, and researching other hospital EDs. From this analysis of information, the team developed recommendations to improve the patient flow and privacy at the front end of the ED.

Results, Findings, Conclusions, and Recommendations

Our team was able to gather a large amount of data that can be classified as data regarding patient privacy and patient and visitor flow. The details of our findings, conclusions, and recommendations based on this data follows.

Patient Privacy

The following section covers the results of data related to patient privacy issues used in this project.

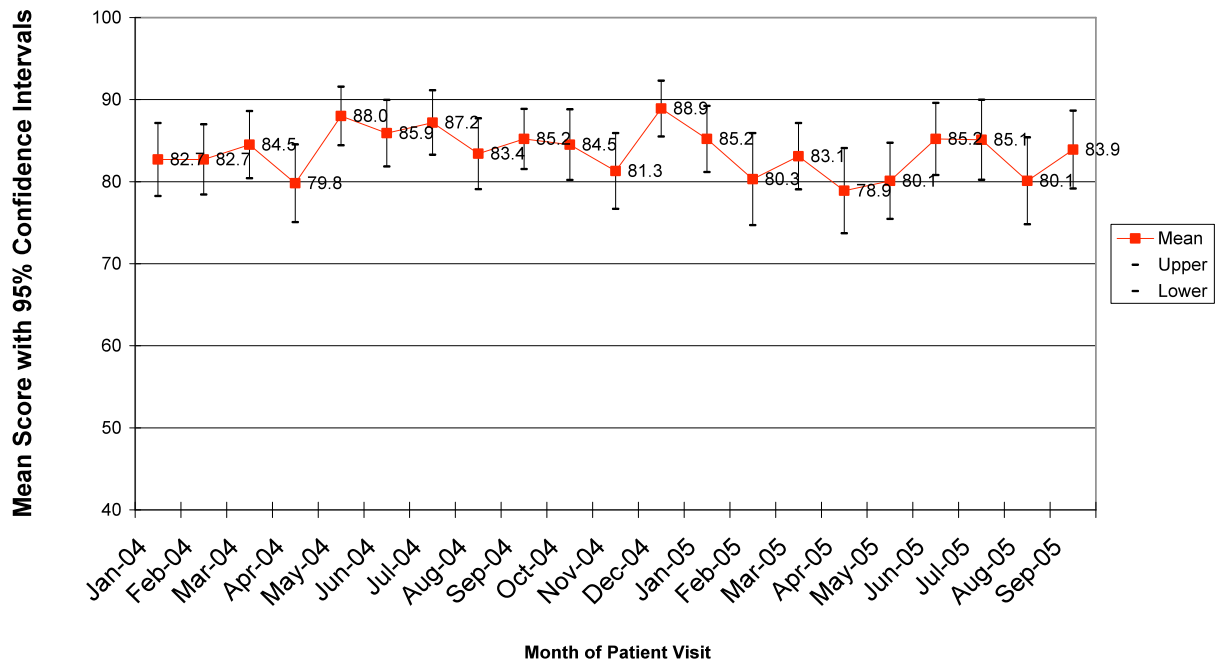
Privacy Survey Data

Our team was able to obtain privacy data including patient satisfaction survey scores as well as written comments that will be discussed below.

Findings

The following figure, Figure 1, quantifies ED patient's concern for their privacy when giving personal information from January 2004 to September 2005. The values in the figure demonstrate the level of perceived privacy and overall satisfaction with the current ED. The figure shows that mean satisfaction scores range from 78.9 to 88.9 on the scale of 0 to 100, which demonstrates patients have no complaints with the current ED in terms of their privacy.

This data was taken from the Quality Improvement Department patient satisfaction surveys. Questions are asked on a five-point scale, generally ranging from poor to excellent. Scores are reported as a converted mean where a "1" becomes a "0", "2" becomes "25", "3" becomes "50", and so on to "100". The mean values, which are displayed in the graph, are then taken from the converted score. The sample size for each month ranges from 74 to 109 with a mean of 89.



Source: Patient Survey; Sample size: 1,700 surveys

Figure 1: Patient Concern for Privacy When Giving Personal Information in the ED

For reference, similar graphs for Ease of Giving Personal Information in the ED and ED Nurse's Concern for Privacy from the patient satisfaction surveys can be found in Appendix E. These graphs were also provided by the Quality Improvement Department.

In Appendix F are sample patient comments relating to privacy in the front end from January to October 2005 from a patient survey given to every 9th patient in the ED. We were given a sample size of 1756, yet not all comments related to the front end. Those comments that did relate to the front end are related to general privacy, reception, NASA, waiting room, security, and HIPAA violations.

Conclusions

The mean scores followed no monthly trend. In fact, scores fell sporadically in a 10 point range from 78-88.

The team concluded that since the mean scores never reached 90, patient perception of privacy in the front end is mediocre and needs to be improved by making changes to the front end processes and layout.

To increase the patient privacy scores to a mean of above 90, the team has further analyzed the following:

- Sound levels
- Layout

- Patient and visitor flow
- Security
- Visitor Policy

These factors to improve patient privacy will be discussed in more detail in the remainder of this section.

Public Relations Interaction at Podium

The ED front end currently incorporates a podium where a nurse sits to evaluate each of the incoming patients. This podium was put in place in 2003 during the SARS outbreak in an effort to reduce airborne disease contamination. We have found that the podium is ineffective in this role and that it is a root cause of the breaches in patient confidentiality.

Findings

A study was performed where 277 patients and visitors were observed walking by the podium during a total of 243 minutes. This is 1.15 people per minute, which is a significant volume of traffic in the front end of the ED. Of the people walking by, 37 or 13% asked public relation questions to the nurse stationed there. While these people were asking questions or walking by, 30 patients and visitors (11%) were checking in at the reception desk. This data demonstrates that approximately 20% of the patient and visitor population is converging at this podium and contributing to privacy breaches at any given time.

Figure 4 below, shows the frequency of the most common questions asked to the podium nurse. This data will be useful in developing signs and information pamphlets to address patient and visitor concerns.

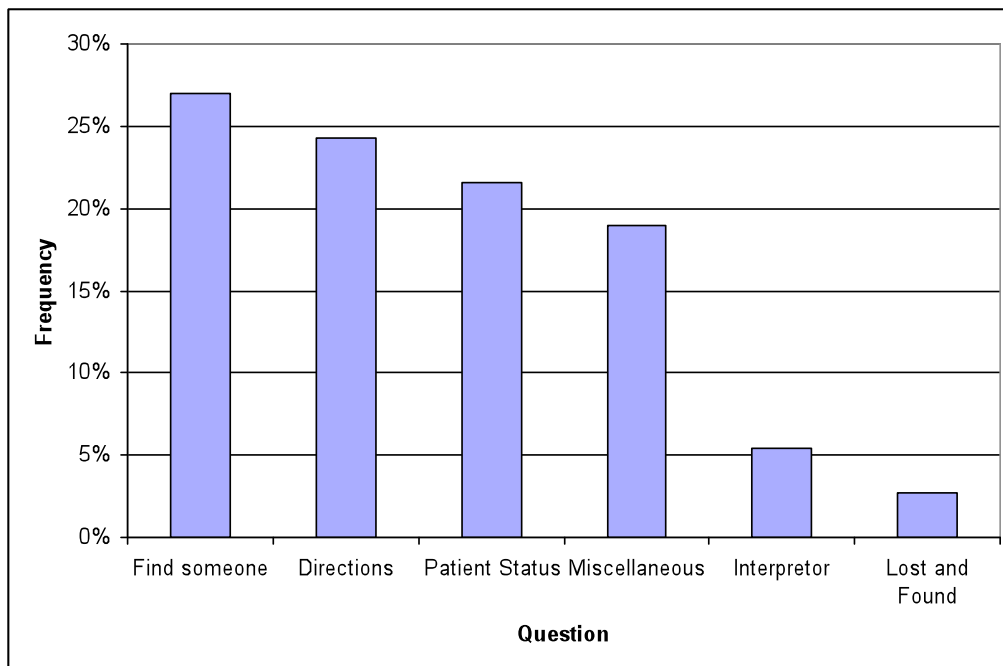


Figure 2: Frequently Asked Questions asked by Visitors and Patient at the Podium

Conclusions

Airborne or droplet propagated disease can travel to a three foot radius of the carrier (Center for Disease Control, Infectious Disease Fact Sheet), which at the current podium position would hit the nurse. However, it would not hit the clerks behind the desk as the desk is 36" deep.

A poll of 21 waiting visitors and patients in the waiting room found that 80% of them associated the podium with a hostess position such as at a restaurant. This association is undesirable because visitors and patients surround the podium to ask public relations questions while the nurse is listening to a patient. This crowding can result in breaches in patient confidentiality while the patient is checking in and in any possible disease propagation.

The lack of space in the reception area also confounds the ineffective use of the podium. Because the podium is positioned in the middle of the hallway, it is a constant meeting and stopping point for everyone traveling through the front end.

Recommendations

With the results from this data we recommend that this podium be removed from the area for the following reasons:

- It does not reduce the spread of airborne disease.
- It increases the risk for privacy breach.
- It increases the nurse time spent answering public relations questions.

To prevent a build up of people at the podium, we suggest that an information station be placed in the reception area instead of the podium. The information station would serve as the central question booth of the front end. This information station would be placed in a different area to keep it away from the front desk. The specifics of the optimal location are discussed further in the layout section.

The nurse positioned at the podium would be moved behind the desk to protect him or herself from the risk of disease. Moving the nurse behind the desk will also reduce breaches in privacy as visitors will no longer have a central circular area around which to congregate. These visitors will be encouraged to go to the information desk for any public relations question they may have.

Expected Outcome and Consequences

The following outcomes are expected once these recommendations are put into practice:

- Reduced number of privacy breaches.
- Reduced sound level from arriving patients.
- Better utilization of nurse working time.
- Less confusion of public relation positions.
- Improved patient and visitor flow through the reception area.

Sound Levels

The following results show the sound levels in the front end and how our team used these sound levels to make conclusions and recommendations.

Findings

Patients and visitors overhearing another patient's information is one type of breach examined in this project. Auditory breaches commonly occur at the podium, check-in desk, and in NASA area. To document current sound levels during the check-in process, the team measured the sound in decibels. We stood in all four corners of the entrance area and found that the measurements were the same in these locations when there was no noise from traffic or patients. This is expected and will be used to compare sound levels when there is a higher volume of traffic in the reception area. These sound levels ranged from 56 decibels to 62 decibels.

The direction that the patient is facing when giving information affects sound levels. Table 2 shows the sound levels taken behind the patient and next to the entrance doors while the patient spoke towards the podium and the front desk.

Table 2: Sound Levels when Patients Face Towards the Check-In Desk

Measurement Taken From	Patient Facing	Minimum	Maximum
Behind Patient	Podium	62 dB	68 dB
Behind Patient	Check-In Desk	58 dB	64 dB
Next to Entrance Doors	Podium	65 dB	68 dB
Next to Entrance Doors	Check-In Desk	62 dB	67 dB

Table 2 shows that sound levels when a patient spoke towards the podium were 3 to 4 decibels higher than when a patient spoke towards the check-in desk. These measurements vary depending on the volume of the patients' voice. The team was able to overhear patient information even when patients spoke towards the check-in desk.

The team observed activities in the NASA area and noted the potential for auditory breaches to occur. Patients standing at the check-in desk can clearly overhear conversations occurring in NASA. Other patients in the NASA waiting area can also overhear patient assessments.

Conclusions

Patient information given at the podium is more likely to be overheard since it has a higher sound level. This risk needs to be minimized. Auditory breaches are less likely to occur at the check-in desk. However, the chances of a breach at the check-in desk should be reduced further. The NASA area should be safeguarded for auditory breaches as well.

Recommendations

After observing the sound levels at various locations in the front end, the team recommends installing sound absorbing material at the reception and NASA areas in the front end. The purpose of the sound absorbing material is to improve the patient privacy and reduce the number of auditory privacy breaches by decreasing the sound level and traveling of sound when personal information is spoken.

Reception. The team recommends installing sound absorbing wall panels at the reception area. These sound absorbing wall panels should be made of acoustically absorptive fiberglass core material. The panels should be installed on the bare wall space behind the reception desk as well as the bare wall space on the sides of reception desk.

The suggested product for use is the Noise S.T.O.P. Fabrisorb™. This product is a decorative fabric wrapped, custom acoustical wall panel distributed by Acoustical Surfaces, Inc.

The team also recommends removing the podium. Auditory breaches are more likely to occur because sound levels measurements were higher when patients turned towards the podium. The sound is not contained because the podium is located away from walls and any other sound barriers.

NASA. In the NASA area, the team recommends installing sound absorbing curtain partitions for each opening to the NASA exams rooms. The recommended material for the curtains is close woven vinyl or polyester/cotton blend satin fabric with a heavy plastic fabric-like backing of Therma-Foam. Sound trapping space is created by Therma-Foam backing.

Expected Outcome and Consequences

Implementing the above recommendations should result in the following improvements:

- Auditory breaches of privacy will be reduced in the reception and NASA area.
- Based on the manufacturer's specification the current reverberation of sound levels will decrease by 25%.
- Perceived privacy breaches will be decreased.

Visitor Policy

We obtained the visitor policy to determine if the policy is currently being enforced and to suggest modifications. The results of the visitor policy analysis are below.

Findings

Visitors that accompany the patients at check-in, in NASA, and in the waiting room add to the human flow in the front end. Visitor policies are used to help control the flow of visitors at these locations. Our client provided the current visitor policy and the ED visitor control document for UMHS which covers the following points:

- Visitors must report to the main ED unit host.
- Visitors shall remain in the ED waiting room.
- Visitors need to obtain a visitor pass which is worn visibly to enter treatment areas.

- Visitors must be escorted into treatment areas by clerk.
- Patients are limited to two visitors.
- Visitors in large groups are not allowed.
- Visitors that are disruptive will be escorted out by security.

The visitor policy and the visitor control document are included in Appendices G and H. The team observed many violations of the visitor policy in the form of too many visitors and visitors standing in close proximity to other patients. These violations occurred because no one enforced the visitor policy. Many visitors were unaware that they needed to be escorted into patient treatment areas, which proves that they have not been provided information on the policy.

Conclusions

The visitor policy needs to be better enforced by the staff. Nurses and clerks should only allow two visitors per patient. Visitors also need to be better educated about the visitor policy so that fewer violations occur. Fewer visitors will indirectly reduce the chances of a privacy breach. If the number of visitors is limited, fewer people will be exposed to patient information.

Recommendations

Our team recommends educating the visitors to reduce visitor policy violations. Nurses and clerks should distribute pamphlets with a brief summary of the visitor policy upon visitor arrival. Signs should be displayed in the waiting room and check-in areas indicating the same information that is included in the pamphlet. Additional signs stating a minimum standing distance of three feet should be implemented. The proposed pamphlet and signs are included in Appendices I through K. Nurses and clerks should also prevent patients from bringing extra visitors along by verbally enforcing the visitor policy when appropriate.

Expected Outcome and Consequences

Implementing these recommendations should result in the following results:

- Fewer violations of the visitor policy.
- Fewer questions asked to nurses and clerks regarding policy.
- Reduced visitor flow.
- Fewer privacy breaches.

Waiting Room

Our team conducted a study of the number of visitors in the waiting room throughout the day to determine a trend in visitor movements through the front end. The details of this study follow.

Findings

To quantify the number of visitors to the ED, the unit clerks collected hourly counts of the total number of people in the waiting room. Figure 2 shows the average number of visitors in the waiting room during each hour and half hour of the day.

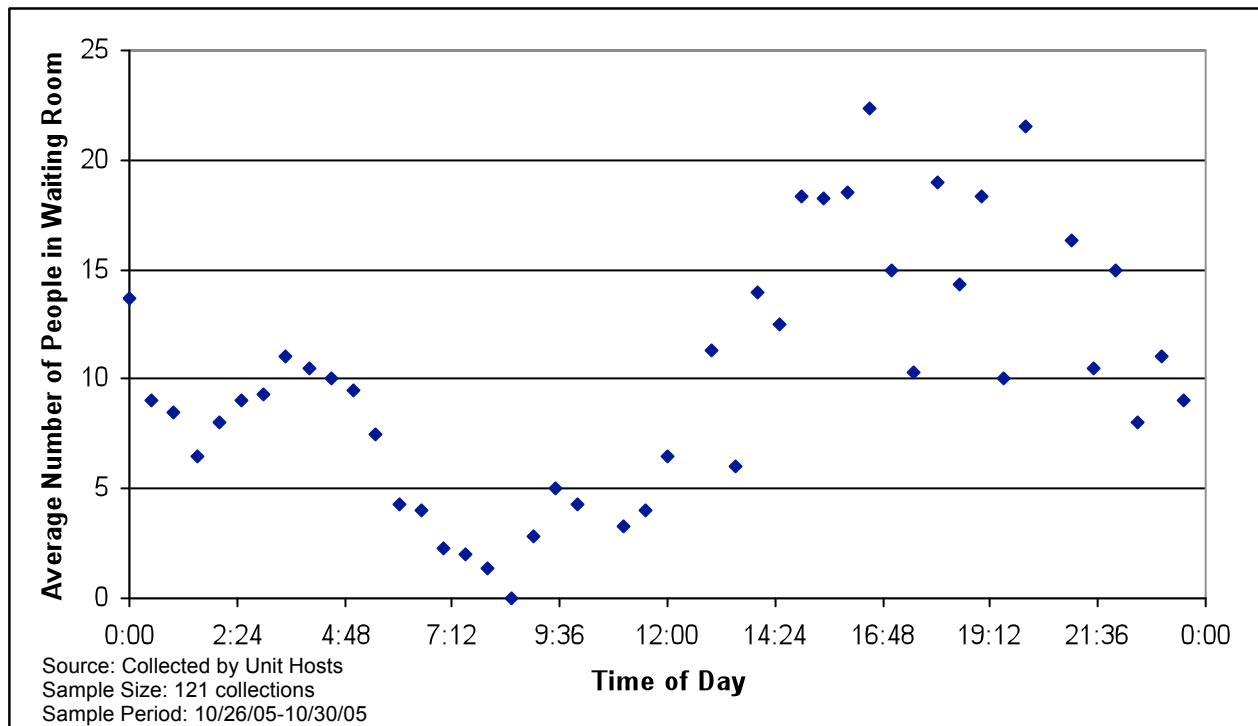


Figure 3: Average Number of Visitors in Waiting Room throughout Day

Figure 2 shows an unstable pattern for the number of visitors in the waiting room. No real trend can be established. The waiting room contains a high number of visitors between 2 and 5am, and between 2 and 9pm. The lowest number of visitors occurs between 5 and 11am.

Through observations of the front end, we saw that visitors add to the human flow in the front end by walking between the waiting room, bathroom, vending machines, and telephones. Visitors often ask questions to the nurse at the podium or the clerk behind the desk. When asking questions, visitors approach the front desk or the podium, which increases the risk of a privacy breach.

Conclusions

Visitor flow in the ED front end varies greatly throughout the day. These visitors add to the traffic near the front desk and the visitor flow needs to be controlled, especially during peak times.

Recommendations

Our team recommends that maps showing the location of the bathroom, vending machines, and telephones should be distributed in the waiting room and/or upon check-in of the patient. Visitors will then be more educated and will not ask as many questions to the nurses and clerks.

Although major architectural changes are not within the scope of this project, our team recommends that in future renovations, the waiting room should be in close proximity to the bathrooms, vending machines, and telephones. This recommendation would reduce the amount of traffic passing the front desk, which would decrease the risk of a privacy breach.

Expected Outcome and Consequences

The following outcomes are expected once these recommendations are put into practice:

- Visitors will be better educated about hospital layout.
- Visitors will ask fewer questions to nurses and clerks.
- Visitors will approach the front desk and podium less often.
- The chances of a privacy breach will be reduced.

Security

Throughout this study concerns with the level of involvement of security have been expressed by the front end staff as well as the ED Nurse Manager. The ED Security Supervisor has confirmed that issues have been raised between the security officers and nursing staff in the front end. These issues include:

- Visitors are not being checked as they enter.
- Security is not always visible to the parking lot.
- Security is not always visible in the front end.

These issues were initially out of the scope of this project, but as they apply to the volume of visitors in the front end, a small analysis of the visitors checked by security was performed.

Findings

After conducting this observational study, we found that of 49 patient arrivals, only 4% or 3 visitors were questioned by security to determine why they were coming through the ED entrance. This is observed in Figure 3 to follow.

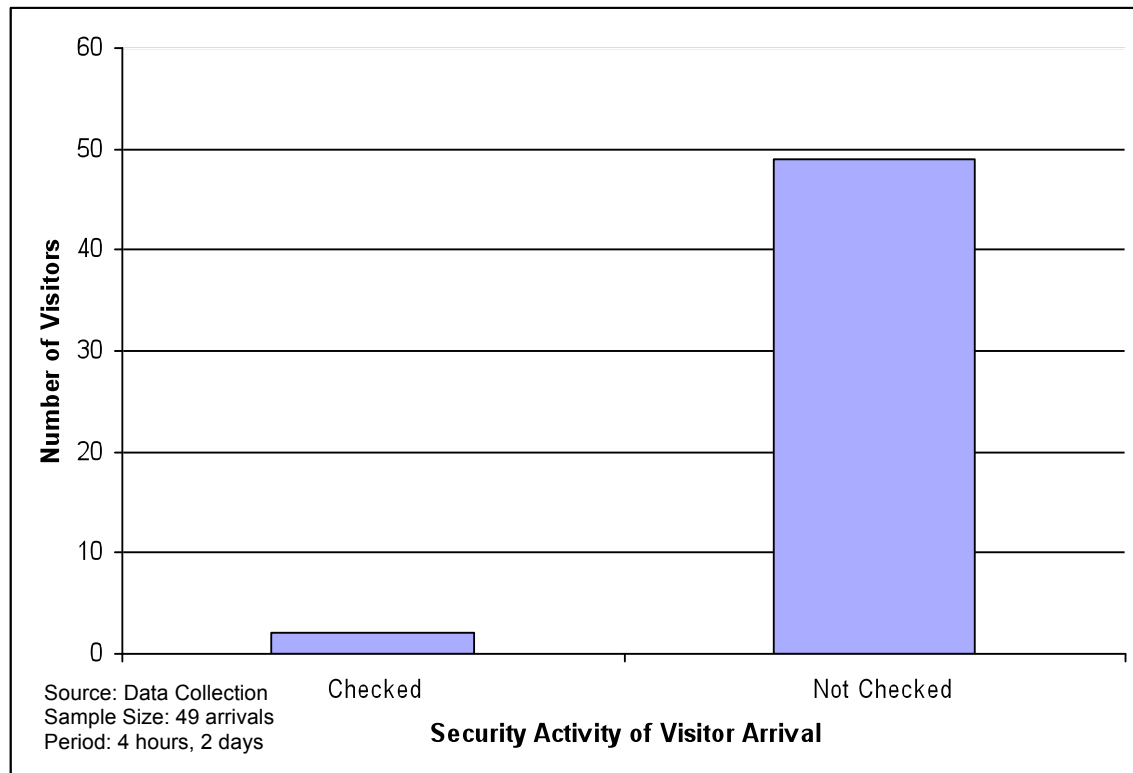


Figure 4: Security Activity of Visitor Arrivals in ED

Conclusions

The above findings suggest that security should have a more visible role in the front end where each visitor has an opportunity to be screened as he or she enters or exits the ED.

Recommendations

Educational pamphlets or maps distributed at reception could guide visitors to other entrances and exits once they have checked in. This would reduce the number of people security had to check entering the ED front doors. ED visitor stickers should also be issued to visitors upon entrance. This would identify visitors and show that they have already been screened by security, so no further checks need to be made.

After consulting with the ED Security Supervisor, we determined that further research should be completed to determine the actual activities of the two security personnel assigned to the front end. This would validate the distribution of time spent on each security activity and whether security personnel should be distributed differently in their job tasks or if more security Full Time Equivalent's (FTE's) should be added.

Expected Outcome and Consequences

Implementing the above recommendations should result in the following improvements:

- Reduced pedestrian traffic through ED front door.
- Clarification of visitors in ED through visitor stickers.
- Further studies into the role of security.

Patient and Visitor Flow

The following section is the results relating to patient and visitor flow issues. The recommendations will improve flow, bottlenecks, congestions, and efficiency of nurses in the ED front end.

Current State Value Stream Map

Our team developed the current state value stream map below, Figure 5, which shows the main process steps as well as the material and information flow in the front end of the ED. Process times and wait times are included. These times were taken from the information compiled by the Emergency Department Lean Team and are a combination of data and observations.

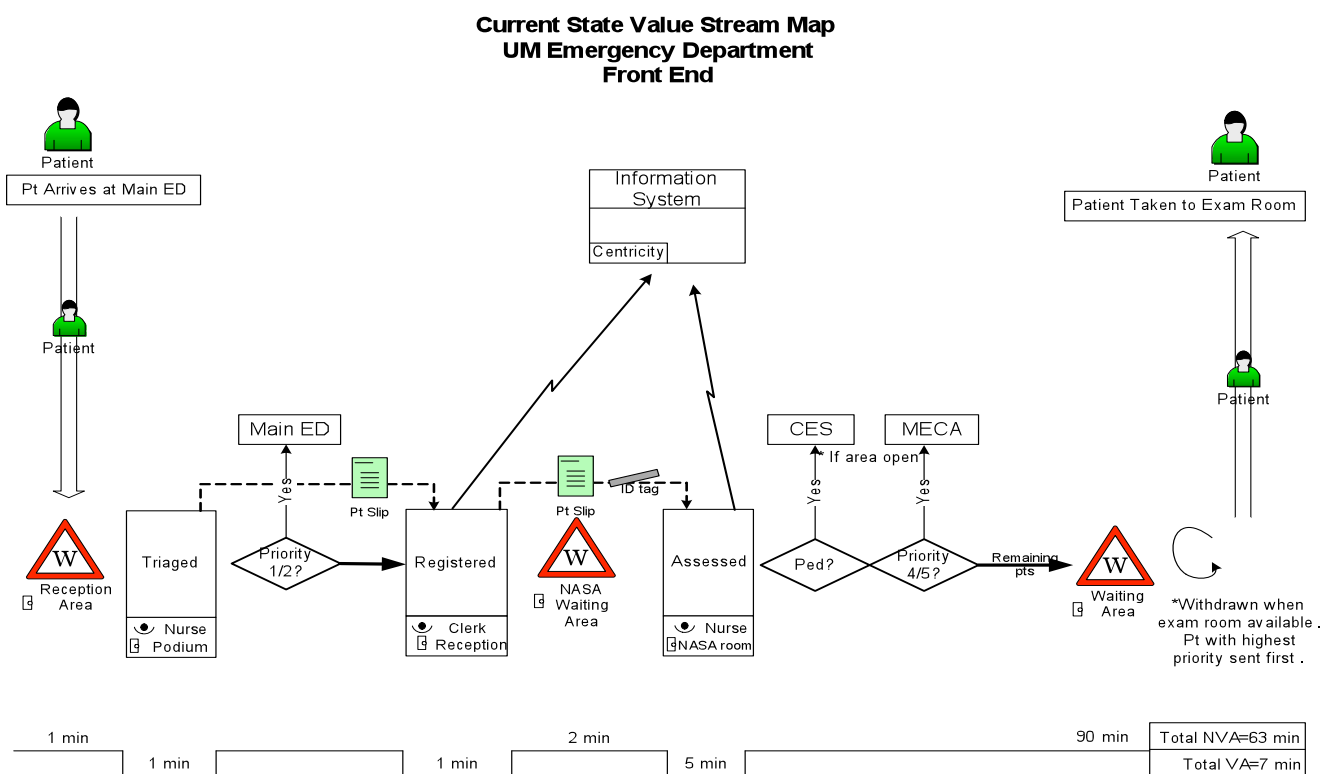


Figure 5: Current State Value Stream Map

Layout

The floor plan of the reception area was physically measured and studied to evaluate the flow of patients and visitors in this specific space.

Findings

The current dimensions and layout of the ED front end can be observed in the following figure, Figure 6. The dashed lines represent the current flow of patients and visitors as they move from check in to the waiting room to the bathroom/vending area.

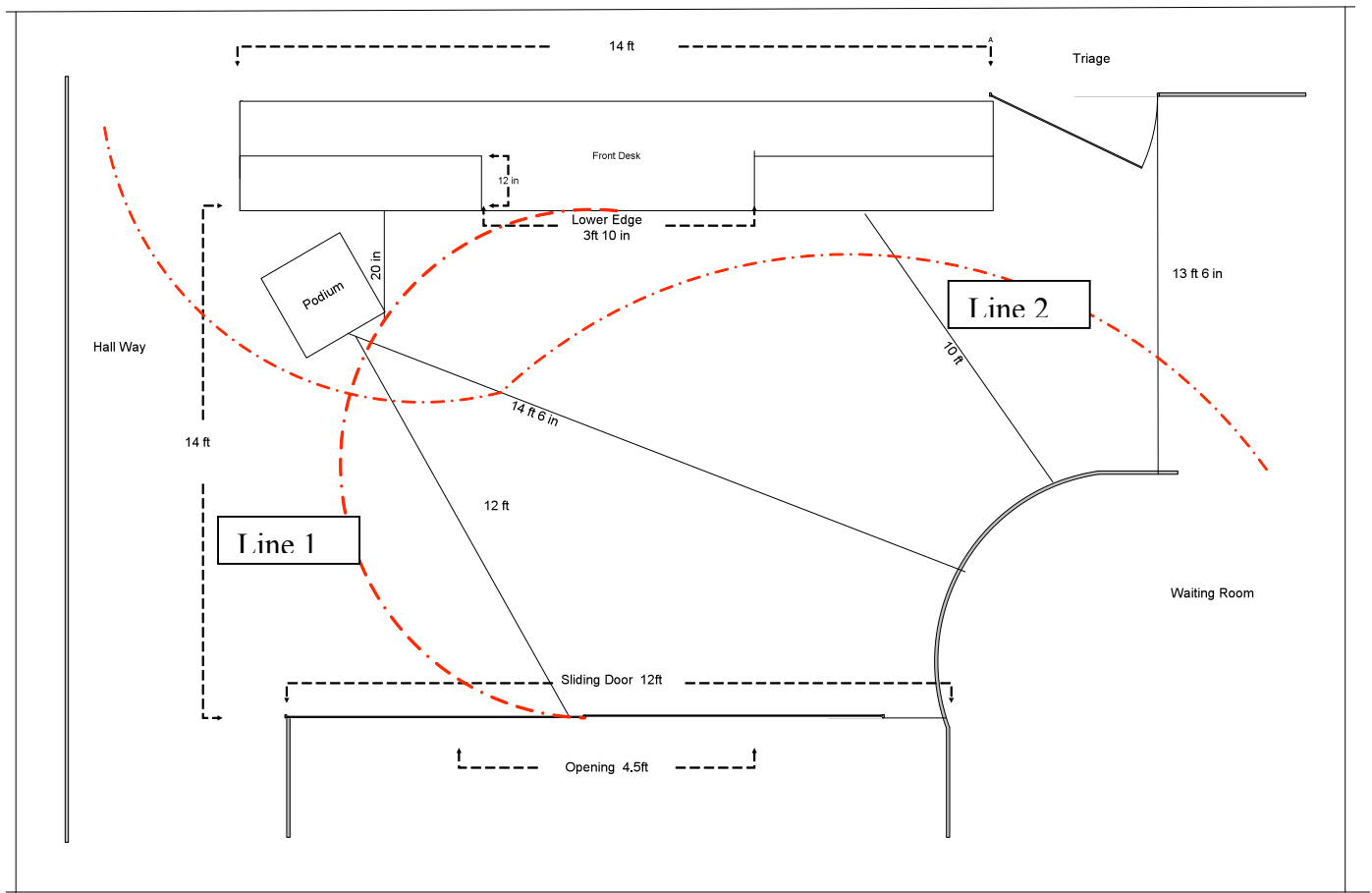


Figure 6: Current State of Flow in the Front End

Conclusions

The layout in Figure 6 demonstrates the flow of patients and visitors, which results in breaches in patient privacy and the large volume of questions directed to the podium nurse. The first dashed line (Line 1) traces the path patients are meant to take, from the entrance to the podium to the front desk. The second dashed line (Line 2) traces the path visitors and patients take to go to the bathroom, vending, the cafeteria, an alternate exit or to ask a question. From the waiting room they walk by the front desk and the podium to get to the hallway leading to the main hospital. By being routed this way, there is more opportunity for breaches in privacy and for the nurse to be asked a public relations question as the person walks closely by the front desk and podium.

Recommendations

In Figure 7, to follow, the recommended layout of the front end and the predicted patient and visitor flow is demonstrated. In this layout, the podium is removed and an information desk is added by the front door. This desk would be a greeting and information booth for all patients and visitors to the ED. Because it is immediately on

the left as the patient walks in, a check can be made to restrict the entrance to only patients. Visitor passes and stickers can be given to help identify the current people in the front end and information packets with a map of ED can be given to help in the answering of future questions. This information station could be manned by a greeter position supported by FTE's from the Security Department as well as the Clerical Services department. This would be beneficial because this position could be a link between the internal unit hosts and the external security personnel and have training from both departments.

In Figure 7 below, the dashed lines demonstrate the predicted visitor and patient flow. The two dashed lines from the door (Lines 1 and 2) demonstrate that patients checking in can either go to the information desk or bypass it and still go to the reception desk. This will stop the backup of people waiting around for the podium nurse and promote single file lines to the front desk. The flow of patients and visitors to ask questions and visit other places in the hospital (Line 3) will be improved because people will know where the proper place is to ask questions and then they will be directed around the reception desk to the hallway connecting to the main hospital.

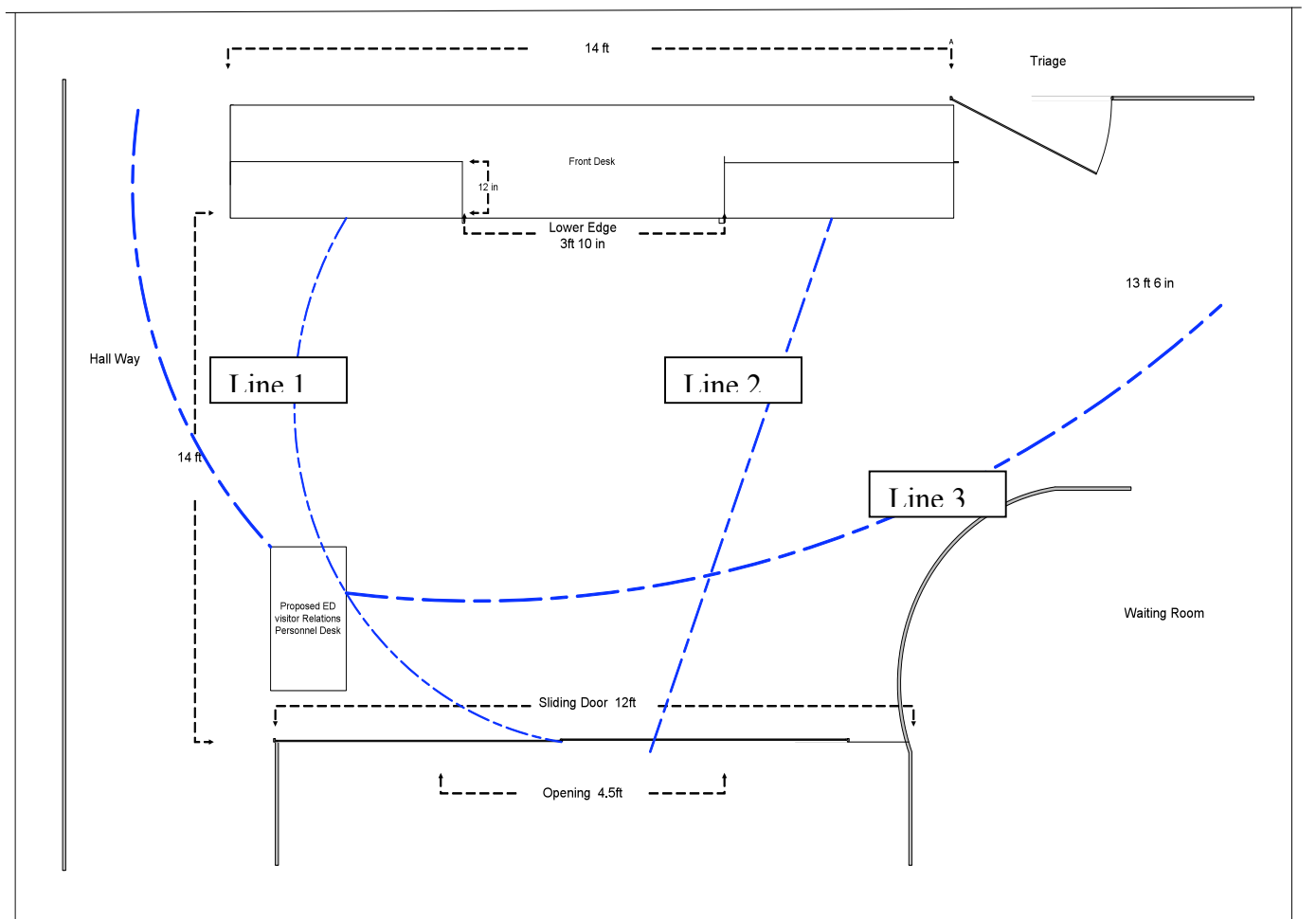


Figure 7: Future State of Flow in Front End

Expected Outcome and Consequences

Implementing the above recommendations should result in the following improvements:

- Increased satisfaction of care for patients and visitors.
- More efficient flow of visitors and patients.
- Information more readily available.
- Less congestion in check-in process.
- Avoid potential breaches in privacy with diverting of patient and visitor flow.

Pediatric Patients

Pediatric patients are currently adding to the flow through the ED front end so our team found it necessary to quantify this flow in an effort to seek flow improvement.

Findings

The current patient flow in the front end of the ED includes triaging, registering, and assessing adult (≥ 18 years) and pediatric (< 18 years) patients. Pediatric patients are sent to Children's Emergency Services (CES) after they are assessed in NASA if CES is open. (See Figure 5 Current State Value Stream Map for details). On average 37.1% of patients that arrive into the ED front end are pediatric patients. Refer to Table 2 below.

Table 3: Average Arrival of Pediatric & Adult Patients per Day

<18 (Pediatrics)	≥ 18 (Adults)	Total	% Pediatrics
51.74	139.49	191.23	37.1%

The average hourly arrivals of pediatric patients versus adult patients can also be seen in Figure 8 below.

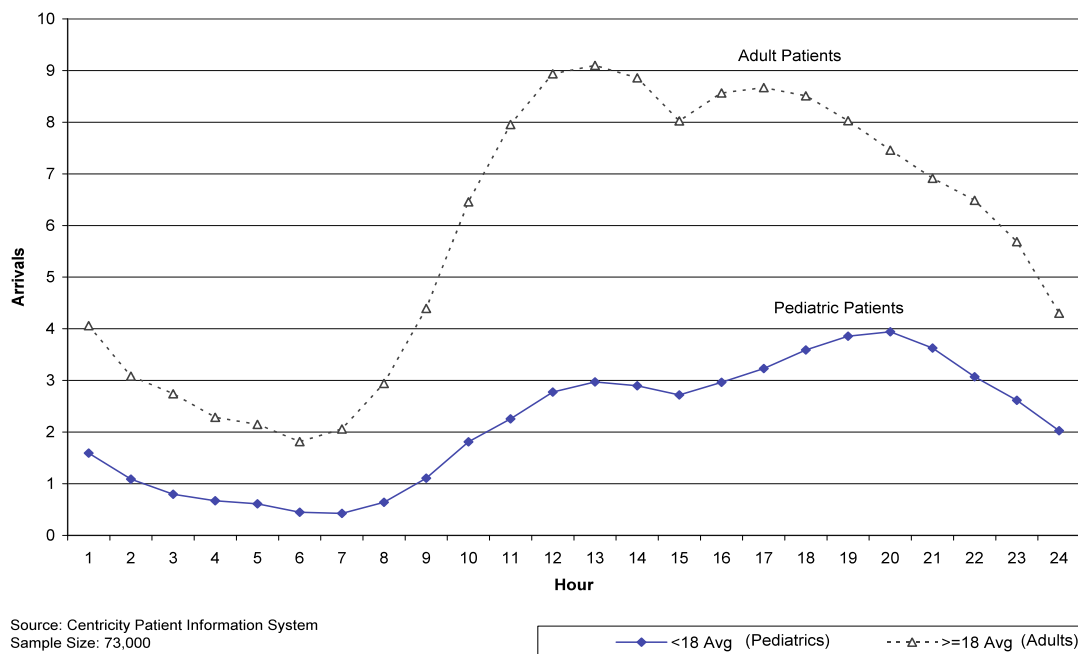


Figure 8: Average Hourly Arrivals to ED

The data was extracted from the Centricity Patient Information System and included patient arrival times from calendar year for 2004 with a sample size of 73,000.

Conclusions

According to the Centricity data, over a third of the patients arriving in the ED are pediatric patients. Figure 8 shows a similar hourly arrival trend with a peak in the afternoon which is similar for both adult and pediatric patients. Therefore, an elimination of pediatric patients in the front end of the ED would reduce the total volume of people in the ED front end consistently throughout the entire day.

Recommendations

The team recommends sending pediatric patients and their visitors directly to CES after triage and check-in at reception. We recommend not assessing the pediatric patients in the NASA area with the adult patients.

The team also recommends an additional analysis on the effects of sending pediatric patients to CES for assessment. Resource constraints and increased volume effects in CES should be studied further.

Expected Outcome and Consequences

The following outcomes are expected once these recommendations are put into practice:

- Reduce the volume of patients and visitors in the NASA area by one third.
- Improve patient flow in the front end by reducing traffic and congestion in the constrained spaces.
- Reduce the number of privacy breaches.
- Increase the throughput in the NASA area for the remaining adult patients.
- Increase specialized attention for Pediatric patients by assessing in CES.

Future State Value Stream Map

The future state value stream map, Figure 9 to follow, maps the front end with the patient flow changes recommended by the team. These changes are the following:

- Implement an information station in the entrance way.
- Remove the podium position and relocate the nurse to reception desk.
- Send pediatric patients to CES immediately after registration.

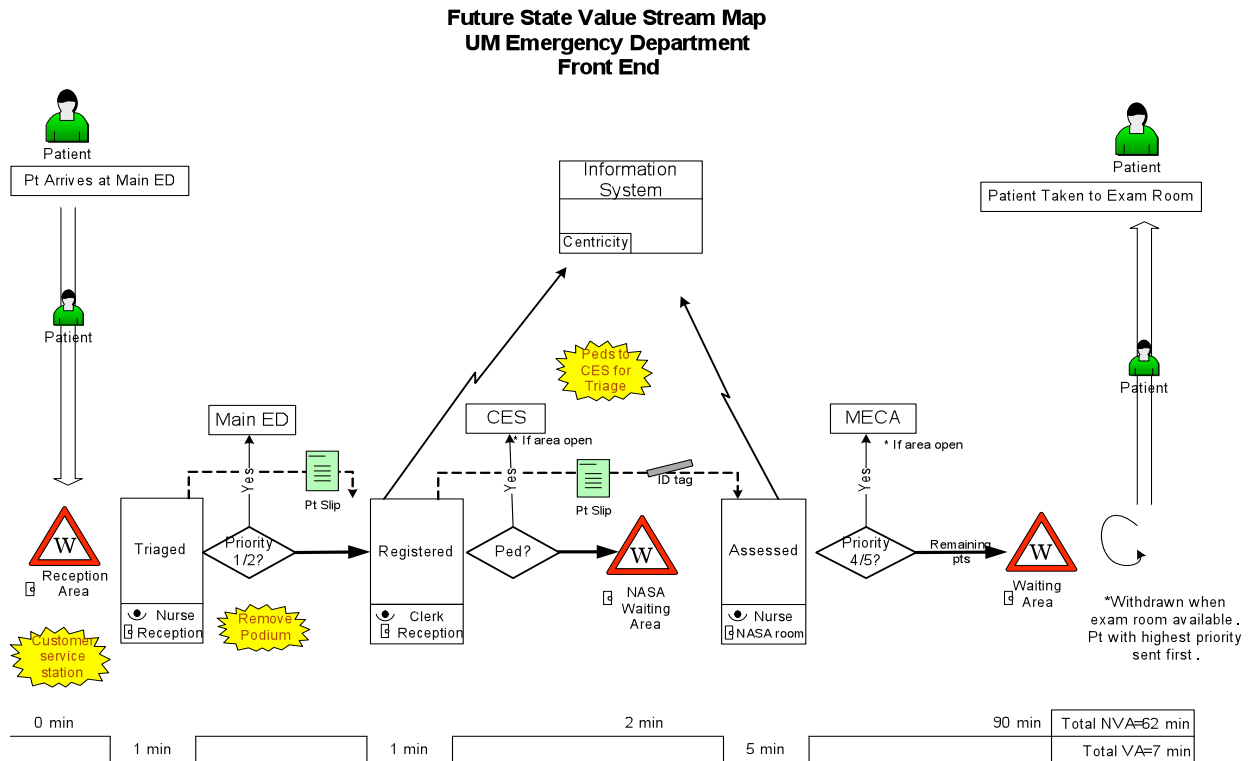


Figure 9: Future State Value Stream Map

Literature Search

To expand our background knowledge on the privacy issues and the ED layout and patient flow, we conducted literature researches. The literature research was done via World Wide Web, mostly from major search engines and the University's electronic journal database. We have found three previous studies done on the similar topic of perceived privacy issues at the ED. Results of the studies and their significance for our project are detailed below. We have also found an article that recommends several success factors for ED patient flow. This article provides eight common factors identified from successful examples of efficient patient flow implementation in the ED. We considered the below eight factors when making recommendations for the front end ED flow and layout. Please refer to the Appendix L for the citations of sources and authors.

Confidentiality and Privacy Breaches in a University Hospital Emergency Department

The objective of this study was to determine the frequency of visual and auditory confidentiality and privacy breaches in a university hospital ED. This study defines privacy breaches as collection of patient information such as name, room number, diagnosis, tests, past medical history and personal information. The study found that more than 53% of patients experience privacy breaches near the triage and waiting areas. Based on the study, the authors conclude that all members of the health care team commit

privacy breaches, and that the frequency of the breaches is dependent on the ED architecture and floor plan.

The results of this study are a major support to the purpose and the importance of this project. This study proves that there are significant occurrences of privacy and confidentiality issues at the triage and the waiting areas in an ED, and states the need for further research regarding the flow and layout of the ED, which are proven to affect privacy.

Patient Perceptions of Privacy Infringements in an Emergency Department

This study identifies the nature, severity, impact, frequency and risk factors of perceived privacy infringements at the ED. The privacy incidents are defined as breaches of medical or personal information or exposure of private body parts. The study found that 68% of patients reported a probable or definite privacy incident. Other findings were that 41% of patients overheard other conversations, while only 15% noticed that their conversation was being overheard. 11% of patients who experienced inappropriate exposure of body parts and 4% of patients reported that they withheld their information or refused examination due to fear of privacy breaches. Patients' length of stay was positively correlated to the frequency of the privacy incidents, and patients in a walled cubicle perceived fewer privacy incidents than those in absence of walls.

The results of this study support our recommendation of having sound masking material on the walls or between NASA areas, proving statistically that this measure will significantly decrease the privacy and confidentiality incidents. Also, based on the finding that the length of stay is positively correlated to the frequency of privacy incidents, we recommend a further research or an in-depth project studying methods to reduce the waiting time and improve timeliness of the patients being examined at the Emergency Department. This study also raises the issue of incorrect treatment for a patient due to incorrect information given by the patient, resulting from a fear of privacy breach.

Emergency Department Patient Perceptions of Privacy and Confidentiality

This study determines whether the type of the room affects the occurrence of privacy issues. The privacy issues were defined as overhearing conversations from other areas. This study finds that about 36% of patients overhear the conversations with similar frequencies in walled and curtained rooms. However, the location of conversations differed between these two types. Curtained rooms allowed more conversations from adjacent rooms, while walled rooms allowed more conversations from the hallway or nursing station.

From the results of this study, we conclude that while implementing sound absorbing walls, we should also decrease the unnecessary flow through the hallway or nursing station. Walls will remove the risk of overhearing conversation in adjacent rooms but not from the hallway.

Success Factors Noted for ED Patient Flow

- Recognize that ED crowding is a hospital-wide problem, not an ED problem.
- Build multidisciplinary, hospital-wide teams to oversee and implement change.
- Determine the presence of an individual in a well-respected position who sells patient flow improvement to the medical staff and executive management.
- Ensure support from management is guaranteed.
- Use formal improvement methods.
- Commit to rigorous metrics.
- Make the organizational values clear.
- Balance collaboration and competition.

Research of Other Hospitals

The team observed two other local hospitals to benchmark their flow and layout implementation. St. Joseph Hospital in Ann Arbor, Michigan had a layout with more space which could handle the capacity of a large volume hospital. St. Joseph in Saline, Michigan had a more effective solution to the patient privacy problems than UMHS; however, this hospital handles the smallest volume of patients among the three EDs observed. This hospital had glass cubicles with sound and visual separation panels for the patient reception area.

Summary

From the observations, shadowing, interviews, and data collection, the team conducted studies of the privacy survey data, public relations, sound levels, visitor policy, waiting room, security, layout, and pediatric patients to develop recommendations to improve patient privacy and flow in the ED front end. The following table, Table 4, summarizes the major findings, conclusions, recommendations, and expected outcomes for each of the eight topics discussed above.

Table 4: Summary of Findings, Conclusion, Recommendations, and Expected Outcome

	Findings	Conclusion	Recommendations	Expected Impact
Privacy Survey Data	ED patient's concern for privacy when giving personal information satisfaction score < 90.	Problem with patient's perception of their privacy in the front end of the ED.	Team further analyzed sound levels, layout, flow, security, and visitor policy.	Increase privacy of patients and improved quality of patient care
Public Relations	Approximately 20% of the patient and visitor population is converging at the podium contributing to privacy breaches at any time.	The current location of the podium increases risks for privacy breaches and increases nurse time spent on answering public relations questions.	Instead of the podium, an information station should be placed in the reception area and the nurse be moved behind the desk.	Reduced number of privacy breaches. Better utilization of nurse working time. Less confusion of public relation positions.
Sound Levels	Sound levels when a patient spoke towards the podium were 3-4 dB higher than when a patient spoke towards the check in desk.	Auditory breaches of privacy are less likely to occur at the check-in desk.	Installing sound absorbing panels at the reception and curtain partitions for exam opening to the NASA exam rooms.	Auditory breaches of privacy reduced in the reception and NASA area. Perceived privacy breaches decreased.
Visitor Policy	Observation of many violations to the visitor policy.	The visitor policy needs to be better enforced by the staff.	Distribute pamphlets with summary to the visitor policy and display informative signs.	Fewer violations of the visitor policy. Improved visitor flow.
Waiting Room	Unstable pattern of number of visitors in the waiting room. Visitors add to human flow in front end by walking between waiting room, bathroom, and vending.	Visitors add to the traffic near the front desk. Visitor flow needs to be controlled, especially during peak times.	Maps showing the location of the bathroom, vending machines, and phones should be distributed.	Visitors better educated about hospital layout. Visitors will approach front desk and podium less often. Chances of breaches reduced.
Security	Only 4% of visitors were screened by security as they entered the ED.	Security should have a more visible role in the front end.	Visitor stickers should be issued as they enter the ED. Further studies into the role of security.	Reduced pedestrian traffic. Clarification of visitors in the ED through visitor stickers.
Layout	Measurements in reception area and mapping of patient and visitor flow.	More opportunities for breaches of privacy and for the nurse to be asked a public relations question.	New layout with the podium removed and an information desk added by the front door.	More efficient flow. Information more readily available. Less congestion in the check-in process.
Pediatric Patients	Average of 37.1% of patients that arrive into the ED front end are pediatric patients.	Elimination of pediatric patients in the front end would reduce the total volume by one third consistently throughout the entire day.	Sending pediatric patients directly to CES after triage and check-in at reception.	Reduced volume in NASA area. Improved patient flow reducing congestion. Increase throughput in NASA.

Implementation

To implement the recommendations discussed above, a schedule with prioritized steps of action has been developed by our team, in conjunction with our client.

Action Plan

The action plan has been broken down into tasks for be performed in one week, four weeks, and ten weeks. The details of this plan are below.

Step 1: One Week

Within one week of receiving these recommendations the visitor signs and pamphlet should be printed and distributed throughout the ED front end. This task can be overseen by the Emergency Nurse Manager and should be given to the Manager of ED Clerical Services for future maintenance.

Also within one week, the podium position should be eliminated and the nurse should be placed behind the reception desk.

Step 2: Four Weeks

Within four weeks the proposed sound absorption materials should be ordered, delivered and installed on the reception desk walls. The sound absorbing curtains for the NASA examination rooms should also be installed. The Emergency Nurse Manager should delegate responsibility of this to maintenance personnel.

In these four weeks, the proposed layout for managing patient and visitor flow should be implemented. This implementation involves finding a usable workspace to use as the information station desk. Also, a job description for the information station position should be developed. The FTE sharing for this position between the security and clerical staff departments should be finalized. Then, training of the new position should be coordinated by Manager of ED Clerical Services and the Manager of the ED Security, with inputs from the Emergency Nurse Manager.

Step 3: Ten Weeks

Further studies are recommended for evaluating the current role of security in the front end and in making mutually beneficial changes in their interaction with the ED front end staff.

Additionally, further studies are recommended to evaluate the feasibility and effects of moving pediatric patients to CES for assessment.

Overall Expected Impact

The overall expected impact of the implementation of the recommendations made by the team are as follows:

- Increased privacy of patients and reception and NASA area
- Redesign of layout at front end
- Changes to patient flow, staffing roles, and procedures in the front end
- Improved quality of patient care
- Improved patient and employee satisfaction

Appendix A: Data Collection form for Unit Hosts in Waiting Room

*** Please collect data every half hour.**

[illegible]

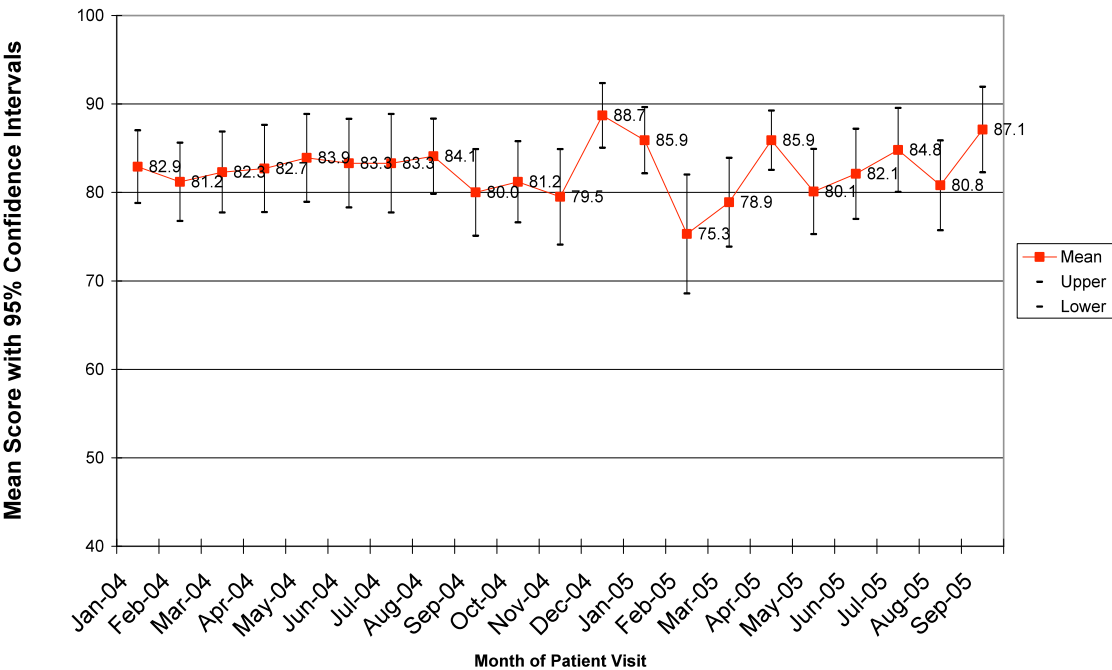
Appendix B: Data Collection Form of Activities in Reception

	Time	# in Waiting Room	# in Front area	# of Angry People	# of Unit Hosts
1					
2					
3					
4					
5					
6					
7					
8					
9					
10					
11					
12					
13					
14					
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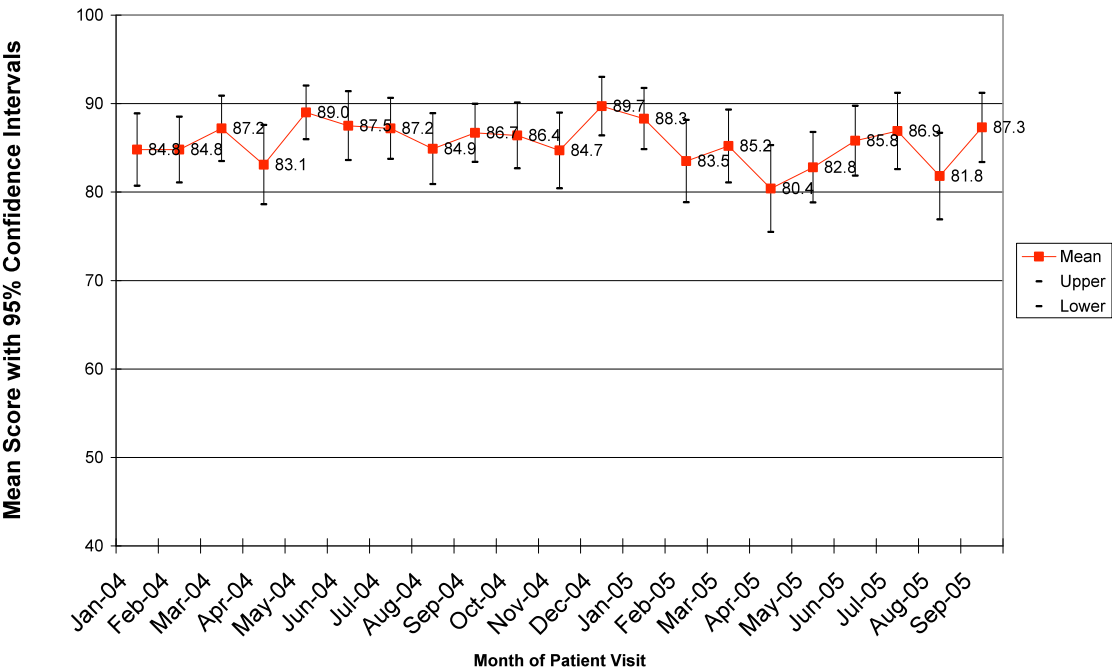
[illegible]

Appendix E: Privacy Charts

ED Nurse's Concern for Privacy



ED Ease of Giving Personal Information



Appendix F: Patient Comments Summary

Patient Comment Summary- ED Front End January 2005 - October 2005

General Privacy

Privacy was non-existent....

... No privacy

Should be careful when asking questions such as Social Security #, phone, birthday etc. in open areas.
Too easy 'social security' accessible by others.

Triage (NASA)

The triage area does not allow privacy.

... The triage area seems rather open, but I felt too bad to care.

There are just TOO MANY triage rooms WIDE OPEN right on top of one another.....

Waiting Room

Head nurse of ER was the rudest person I have ever dealt with. Yelling personal, medical questions across the waiting area.
Information was taken in waiting area - very open, no privacy due to surroundings ...

Reception

No one asked for ins. info. also did not care for 'speaking out' my SS# @ registration.
Clerk was professional, but again, info taken in hallway where everyone could hear.

Security

There is not enough security in the hospital grounds and needed in the Emergency Area.
Safety/security personnel not seen on floor - it would help if they made their presence felt.

HIPAA

...And assistants need to understand the seriousness of violating HIPAA regulations....
HIPAA violations!!

Appendix G: Visitor Policy

UNIVERSITY OF MICHIGAN HOSPITALS & HEALTH CENTERS EMERGENCY DEPARTMENT

VISITOR POLICY

Dear Emergency Patient, Family, and Friends:

To provide for patient privacy and confidentiality and to ensure the safety of all patients, visitors and staff, **two visitors per patient will be allowed in the treatment area.**

Visitation by minor children may be approved based on hospital policy. Please see the triage nurse for clarification and screening. At times it may be necessary to remove all visitors from the treatment area. Please cooperate with our security staff if this occurs.

A pass will be necessary for entrance into the treatment area and may be obtained from the Unit Host. The pass may be exchanged among different visitors for the same patient in order to allow more than one visitor the opportunity to visit with the patient. However, we ask that you do not give your pass to a visitor for another patient to prevent unauthorized entry into the treatment area. Please discard your pass when the patient is discharged from the Emergency Department.

All visitors require staff chaperone for entry into the treatment area. If you should need to leave the treatment area for any reason, please see the Unit Host before returning to the patient's bedside. The Unit Host is stationed in the ED Waiting Room.

Please stay with the patient you are visiting. The Emergency Department can fill with patients very quickly. It is important for patient privacy and safety that visitors stay in the patient's room.'

Thank you,
Emergency Department Staff

Reviewed: 10/04
Revised:
Initials: ED SMT

Appendix H: Emergency Department Visitor Control Document

UNIVERSITY OF MICHIGAN HOSPITALS AND HEALTH CENTERS EMERGENCY DEPARTMENT

GUIDELINE: **Emergency Department Visitor Control**

PURPOSE:

To establish guidelines for visitors of ED patients.

DEFINITIONS

STANDARDS

1. Visitor access to the Emergency Department may be restricted when necessary for patient care and for the safety of patients, visitors, and staff.
2. All visitors to the Emergency Department shall report to the main Emergency Department unit host.
3. All visitors to the Emergency Department shall remain in the ED waiting room (University Hospital B1 B247). Staff will inform visitors when they may come back and visit a patient. Staff shall escort, until visitor is approved, visitors to the patient's treatment area. Visitors taken to the patient's treatment area shall be issued an Emergency Department visitor pass sticker which shall be worn visibly by the visitors.
4. No more than two (2) visitors per patient will be allowed.
5. Visitors for crime victims may be restricted to immediate family only.
6. Large groups of visitors will not be allowed into the Emergency Department. Staff may restrict visitation to immediate family or to a specified number of visitors. All other visitors may be asked to leave or directed to an alternative site outside of Emergency Department. (i.e., B1 C111). The ED attending security supervisor and charge nurse will determine exemptions and alternatives on case by case basis.
7. Visitors who are disruptive will be asked to leave by security.
8. Visitors who refuse to leave when asked will be read trespass. The University of Michigan Campus Police will be contacted for assistance when visitors continue to refuse to leave after having been read trespass.

Appendix H (Continued)

ACTIONS

1. Security Services Responsibilities

- a. Greet vehicles arriving at the Emergency Department lot (lot M-10) and determine occupants' needs, who they are here to visit, if visiting, and their relationship to the patient.
- b. Most visitors who are not transporting a patient and are not immediate family should be directed to park in the M-18 Carport (Parking Area A) or through the main entrance valet when it is in operation.
- c. Notify the Security Services on-duty supervisor, Emergency Department charge nurse, and social worker when large numbers of visitors begin to arrive for a patient.
- d. If visitors are attempting to visit a crime victim or other patient whose visitors have been restricted, notify them that visitation is not being allowed and they should contact the patient/family at a later time.
- e. Large groups of visitors who are not immediate family of the patient may be denied access at the Emergency Department lot and will not be allowed into the hospitals until cleared by Security, the charge nurse, and the attending physician.
- f. Ensure only visitors with Emergency Department visitor passes are in patient treatment areas.
- g. Assist Emergency Department staff with visitors who need to be asked to leave. If visitors refuse to leave, they shall be read trespass and be asked to leave. If they continue to refuse to leave, the University of Michigan Campus Police shall be contacted for assistance.

2. Emergency Department Charge Nurse Responsibilities

- a. Notify Security Services at **936-7890** or **911** when visitors become a problem or when visitors need to be removed from the Emergency Department.
- b. Notify Security Services of all crime victims to determine when there is a need for restricted visitation.
- c. Ensure all visitors have visitor passes visibly at all times.

Appendix H (Continued)

3. Emergency Department Unit Host/NASA Nurse Responsibilities

- a. Issue Emergency Department visitor passes to visitors who will be going to the patient's treatment area.
- b. Badges should have current date and patient's initials.
- c. Obtain clearance from primary nurse before taking visitors to patient areas.
- d. Two (2) visitors per patient at a time.

Revised	9/92	9/95		11/98	1/99	10/99		10/01	6/02	9/04
Reviewed	9/92	9/95	11/97	11/98	1/99	10/99	2/00			
Initials	JGH	JGH	JGH	JGH	JGH	JGH	JGH	ED Mgmt Team/Security	JGH	ED SMT



University Hospital

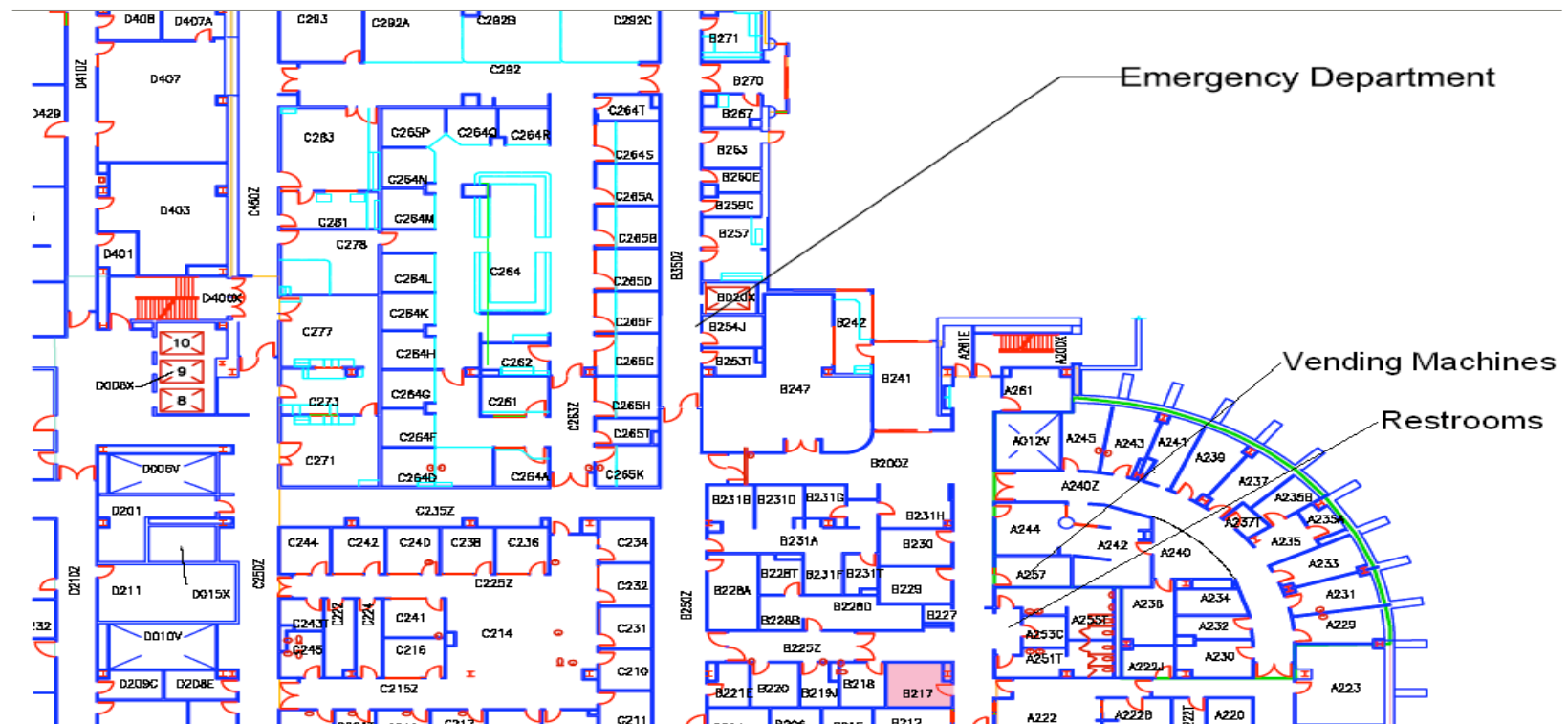
1500 E. Medical Center Drive
Ann Arbor, MI 48109
734-936-4000

Emergency Department **Visitor Guidelines**

To provide for patient privacy and confidentiality and to ensure the safety of all patients, visitors, and staff, we request the following:

1. **Two visitors per patient** will be allowed in the treatment area.
2. A pass will be necessary for entrance into the treatment area and may be obtained from the Unit Host.
3. All visitors require staff chaperone for entry into the treatment area.
4. Please stay with the patient you are visiting.

Appendix I (Continued)



Appendix J: Visitor Policy Sign

VISITOR POLICY



1. **Two visitors per patient** will be allowed in the treatment area.
2. A pass will be necessary for entrance into the treatment area and may be obtained from the Unit Host.
3. All visitors require staff chaperone for entry into the treatment area.
4. Please stay with the patient you are visiting.

Appendix K: Patient Privacy Notice for Reception Area



Please Protect Patient Privacy!

Stand **three feet** away from
current patient.

Thank you for your cooperation,
you will be seen as soon as
possible.

Appendix L: Sources of Literature Search Results

Confidentiality and Privacy Breaches in a University Hospital Emergency

Department

- Source
Acad Emerg Med. 1997 December; 4(12):1142-6
- Authors, Copyright
Mlinek EJ, University of Nebraska Medical Center, Department of Surgery
Pierce J, University of Nebraska Medical Center, Department of Surgery

Emergency Department Patient Perceptions of Privacy and Confidentiality

- Source
The Journal of Emergency Medicine, Vol. 25, No. 3, pg. 329-333, 2003
- Authors, Copyright
Jon C. Olsen, MD, Department of Emergency Medicine, Lutheran General Hospital
Brad R. Sabin, MS, Department of Emergency Medicine, Lutheran General Hospital

Patient Perceptions of Privacy Infringements in an Emergency Department

- Source
Emergency Medicine Australasia (2005) 17, 117-123
- Authors, Copyright
Jonathan Karro, Emergency Medicine, St Vincent's Health, Victoria
Andrew W Dent, Emergency Medicine, St Vincent's Hospital, Melbourne
Stephen Farish, Department of Medicine, St Vincent's Hospital, Melbourne, Victoria, Australia

Success Factors Noted for ED Patient Flow

- Source
Health Reference Center – Academic , University of Michigan Infotrac
- Authors, Copyright
Thomson Healthcare Company, 2004