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I. Summary

Mendocino Coast District Hospital is located in Fort Bragg, California. It is a rural, critical access hospital district with 25 beds and had 25,000 outpatient visits (excluding emergency department) in 2005. The hospital is in the process of financial turnaround and its diagnostic imaging department is very important to the hospital’s viability. The 12-person diagnostic imaging department offers a full range of modalities, is film-based, and includes a check-in area.

Hospital leadership was concerned about the department’s productivity as well as satisfaction with its services by physicians and patients. The Mendocino Hospital felt it important to improve the patient experience as well as the cost effectiveness of the department. Underlying issues included: a problematic physical layout, mistrust of management by the staff, a relatively high level of staffing for the patient volume and the poor workflow.

The hospital collected limited operational data. It suspected low patient satisfaction rates, but did not have the data to measure or improve it. The physical layout of the department was also a problem. Outpatients had to walk a relatively long distance from the hospital entrance to the department and there was a busy public corridor that ran down the middle of the department.

This project was one of three such projects done by the USC School of Engineering under a grant funded by the California Healthcare Foundation. As in the two other projects, which were done at the same time, flowcharting and focus groups were key tools. A flowchart was developed to analyze the processes for each of the radiology modalities in order to identify likely problems. A focus group meeting was held with the entire staff to gather input and enlist their support for future changes. (See Appendix for notes from that meeting.) The staff discussed key issues and utilized a fishbone diagram to define the causes of the problems.

The first round of changes involved implementing new information resources. The hospital commenced a patient satisfaction survey to measure the perception of service and to let patients know that the hospital cares about their experience and wants to meet their needs. (See Appendix.) It also began capturing data about patient flow. Finally, a dashboard report was established to identify improvement priorities that listed productivity indicators such as:

- Patients per day per room or exams done per day per room.
- Throughput in the various radiology modalities (mammography, MRI, etc.)
- Room utilization (or room idle time) as a percent of the available day.
- Patient wait time.
- Backlog.
- Patient satisfaction (as the percent who rate the service as “excellent”)
- No-show rate, as a percent of scheduled appointments.

The USC engineers uncovered problems with the department’s paperwork flow. Radiology technicians, rather than clerical staff, were collecting the needed paperwork (chart and orders,
for example) before they could conduct the exam, thereby causing a delay. The staff and management worked together to revise paperwork and film flow.

Mendocino experienced improvement in the area of patient and physician satisfaction, patient throughput, paperwork, productivity, and wait times.

**Patient satisfaction**: A patient satisfaction survey for radiology was designed and implemented. About 80 percent of the patients surveyed rated the department as “excellent”. The hospital believes this is an improvement but such measurement was not done before the various changes.

**Patient throughput**: The department was seeing about 40 patients per day in February, and by June this increased to about 57 per day. This growth may be influenced by increased visits to the area during summer months but improved productivity meant the volume could be accommodated with existing staff. Concurrently, the hospital downsized by 50 percent from the prior year making it difficult to measure productivity improvement.

**Paperwork flow**: The department was able to reduce waiting times by making sure that technicians had required paperwork before the start of each exam. Ideally, the department would be paperless, but given that this is not currently possible, the hospital instead adjusted staff job descriptions so that assembling paperwork would not be the technician’s responsibility.

**Productivity**: In February, the staff hours per patient was about 1.8 hours, against a common benchmark of just under one hour (University Hospital Consortium). Mendocino’s productivity level indicated overstaffing of at least one-third. During the summer, staffing changes, and increased patient volume reduced the apparent overstaffing by about 25 percent. Hours per patient dropped to 1.3.

**Wait times**: Mendocino lacked wait times measures, though long waits were recognized as a problem. A new computer report generates wait time and exam time for each modality. Having such timing data for each modality (see Table 3) provides management with a tool to accurately identify bottlenecks and address problems.

**Physical layout**: The department recognized that its physical layout needed to be changed. The department is preparing architectural designs to eliminate the second check-in step and improve its appearance and functionality. The management engineers’ work is now being incorporated by architects into plans for construction of a new diagnostic imaging department.

At the beginning of the project, the USC engineers faced a department whose staff often had low morale. This was exacerbated by a sense that management had not fulfilled previous promises to improve the building space and buy new equipment. The engineering students found that the hospital did not have information about some of the most basic and essential measures of productivity, such as exam length, the frequency of no-shows, or utilization of exam equipment. These challenges were overcome or are being eliminated through the team’s efforts.
II. Background

A. About The Hospital

The Mendocino Coast District Hospital is located in Fort Bragg, California. The service area is quite large part of the Northern California coast but includes a population only about 20,000. The population increases significantly in the summer, as it is a popular tourist destination. It is a rural, critical access hospital district with 25 beds and had 25,000 outpatient visits (excluding emergency department) in 2005. The hospital is in the process of financial turnaround and its diagnostic imaging department is very important to the hospital’s viability. The 12-person diagnostic imaging department offers a full range of modalities, is film-based, and includes a separate check-in area.

The building is a one-story structure. It recently converted to a “critical access” status in order to improve its reimbursement from the state. In order to qualify for critical access status it was forced it to reduce its licensed number of beds from 50 to 25.

The radiology department has a full range of radiology modalities including MRI, CT, Mammography, X-Ray, Nuclear Medicine, Ultra Sound and Fluoroscope.

The hospital and the department have undergone several organizational changes in recent years. There is a new CEO who replaced an acting CEO in late 2006. The radiology department head is new to the department and the chief clinical officer changed during the course of the project. Physically, the hospital added a wing on the main building in early 2006 which houses outpatient registration for radiology other services.
B. Proposal and Project Description

In November 2006, the California HealthCare Foundation issued a request for proposals to California safety net hospitals. Management engineering services were offered for projects either in surgery or radiology. The work was to be done by the Engineering School of the University of Southern California at no cost to the hospitals. The work was funded by the CHCF.

Mendocino Coast District Hospital, in Fort Bragg, California requested a project regarding its diagnostic imaging (radiology) department. The proposal from the CEO, specifically requested a focus to eliminate waste with a hope to create “improved patient flows, decreased costs and maintenance or improvement in the quality of care provided to our patients”.

Projects were received from a variety of California hospitals and the proposal from MCDH was accepted. The project began in late January 2007. At the initial meeting were the CEO, the Chief Clinical Officer and director of diagnostic imaging. All the members of the department were interviewed initially, their comments solicited and observation of operations begun.

C. Processes

The radiology department follows typical registration and scheduling steps seen in other hospitals. One rather cumbersome step is that patients first must register in the outpatient building where their insurance is verified and then walk through corridors to get to the radiology department. There they must check-in, so that the radiology staff knows that they have arrived. Often this seems like a duplication of effort to patients. Inpatients are transferred from nearby beds but inpatients are a relatively small portion of the department’s workload.

At the radiology check in area, the patient tells the clerk that they have arrived so that the clerk can verify scheduling and registration information. The clerk then tells the patient to wait in the check in area. Patients wait until a technician from the particular modality for their exam calls them.

1. Scheduling

Radiology department staff does scheduling of patients. They must coordinate with registration staff to confirm that the scheduled patient has necessary insurance. Radiology staff speaks to patients or doctors to assign appointments for patients by using the MediTech computer system. They need to be familiar with the various exam types so they can create an appointment at the appropriate time and give instructions to patients.

2. Registration

The registration function is not part of the radiology department and is located in the outpatient part of the hospital building. (See Appendix) They verify insurance coverage of patients upon their arrival.
3. Modalities

They radiology modalities that are typical in other hospitals are provided at MCDH. These include:

- MRI (at times, a rented machine in a van parked outside the hospital building)
- CT (The MRI & CT are the only scanning equipment on the California coast between San Francisco and Eureka)
- Mammography (one exam room)
- Ultrasound
- Nuclear Medicine
- Fluoroscopy
- Diagnostic X-ray

For a small facility this can be considered a relatively wide range of services. It is also financially challenging since they need to generate enough patient volume to support the cost of the expensive equipment and specialized staff.

III. Data Gathering and Analysis

Information about radiology operations was gathered during January through March of 2007 consisting of interviewing related personnel, observing patient flow and gathering data from the hospital’s information system, MediTech. MediTech is an information system used by many radiology departments and hospitals.

The information system turned out to be a problematic resource regarding this project. When requested, it turned out that the hospital could not produce reports from MediTech regarding daily details on throughput, such as a listing of patients completed, modalities used or exam start and end times. The data was recorded in the system but output reports that summarized patient flow could not be generated.

The closest source to operational data was a simple printed text file listing all of the patients that were seen. The exam start and end times were generally recorded found to be inaccurate – although this was a result of the input not the information system itself. Often the times were entered at the end of the day or well after the patient visit, so the time information was not accurate.

Another important information requirement was regarding the patient’s experience. The hospital was interested but did not know the opinion of patients nor the waiting times they experienced. There was no patient satisfaction survey but one was instituted in March. The form is shown in the Appendix. This survey asked for wait times but such measurement may not be terribly accurate. Wait times were eventually measured by the computer system. There
had been a recent physician satisfaction survey but it was not specifically directed towards radiology.

Most information about MCDH radiology was gathered by interviews of staff and observation of daily activities. The staff was often anxious to communicate their views. A variety of comments were heard in a focus group type meeting with the technicians. (See Appendix) In that meeting a number of problem areas were brought up and the related causes of each problem were discussed. The relationship between problems was drawn in a “fishbone diagram” format during the course of the meeting. Comments most often heard were:

- Concern about the adequacy of equipment, which was often said to be less than what the technical staff desired.
- Concern about supervision. The manager of the department was working for the first time in a management position. She was an experienced radiology technician but had not done the various supervision and leadership duties. She also worked in as a fill in radiology technician. These radiology exam tasks took a higher priority, according to her, so that sometimes management tasks were not done.
- The information system was problematic, the IT staff support was limited and not all the staff was familiar with the information system’s functions.
- Coordination between radiology and registration. Since they were separate organizationally, it was sometimes difficult to coordinate patient scheduling tasks. Also, this two-step process was a subject of complaint from patients and the hospital staff disagreed as to who was to blame for the patient complaints.

The radiology manager reported to the chief clinical person who was replaced during the course of this project. The new clinical leader was experienced in management, both inside healthcare and outside healthcare. However, she had limited success in training the radiology manager since both had multiple responsibilities and were under considerable time pressure.

IV. Findings

After interviewing and data gathering it was possible to reach conclusions about patient flow in terms of what was the actual throughput, productivity and operational problems. These lead to recommended changes. The recommendations were discussed with management and staff. Some of the suggested changes were implemented during the last stage of the project and others are ongoing.

Operational data:
As noted above, patient flow statistics in radiology were difficult to determine. However, approximate information is as follows:

- CT: Average number of patients seen per day = 5, Avg. Exams/patient = 1.35
- MRI: Average number of patients seen per day = 1 (over a week), Avg. Exams/patient = 1.8
- Mammography: Average number of patients seen per day = 7, Avg. Exams/patient = 1
- X-ray & Floro: Average number of patients seen per day = 16, Avg. Exams/patient = 1.2
- Ultra Sound: Average number of patients seen per day = 7, Avg. Exams/patient = 1.1
• Nuc Med: Average number of patients seen per day = .8 (over a week), Avg. Exams/patient = 1.6

Thus the total number of patients seen over a week is about 36 with about 1.2 exams per patient on average.

Problems:

After interviewing and conducting a focus group discussion with the staff (see meeting notes in Appendix), it was possible to include a number of findings – a definition of problems and potential solutions.

The following problems were noted during the course of the project and were discussed with management and staff.

1. Patient & Physician experience.
   a. Physician satisfaction ratings poor and patient satisfaction probably poor but it is not currently measured accurately. Physician dissatisfaction mainly related to appointment availability but little detail is known. Patient dissatisfaction may be due to appearance of the facility and waiting time.
   b. A new patient satisfaction survey was developed but it was poorly distributed and results may be unreliable. Results did show a relatively low satisfaction (although may not be accurate). No clear ongoing program to improve patient satisfaction exists.
   c. Market share is unknown, radiology business lost to others not known but thought to be significant

2. Physical layout problems
   a. Two waiting room experiences occur for each patient’s visit, one for registration, one for radiology. Appearance and effect of waiting in 2 or 3 places is harmful to the patient experience. Check in not near modalities, about 70 yards
   b. Corridor through center of dept. breaks workflow and is harmful to productivity and appearance to the patient
   c. Supervisor not close to action, seems difficult to observe workflow from her office
   d. Wasted space in X-ray work area
   e. The MRI trailer is outdoors, inconvenient and an unpleasant trip for patients when weather is bad
   f. While changes to the layout seem indicated, it would be costly to make changes to layout because the current location has installed special wiring and specialized walls, some lead lined, to support the larger equipment of the department.

3. Procedures & paperwork
   a. Operating statistics are not available, or benchmarked vs. industry norms or compared to past performance, such as:
      • Daily throughput; number of exams done or number of patients seen was not known but supervision or the staff
      • Productivity of rooms (% room is in use, cycles per machine)
      • Average backlog (time until 3rd. available appointment)
• Average procedure time (vs. industry norms)
• Unused capacity, demand monitored to adjust time blocks
• No shows (% is unknown)
b. Benchmarks/targets are needed if operating statistics are reported
c. Scheduling is separate from registration which may be an inefficient arrangement
d. Registration is physically and organizationally distant from radiology department
e. Managing of receipt of doctors orders duplicated in scheduling & registration
f. Patient satisfaction not measured

4. Scheduling
a. Under utilization of resources compared to industry norms
b. Fewer days of service may be a good idea in some cases. If number of patients seen is very low, for a particular modality, perhaps that modality should not be offered on certain days. This would facilitate a tech focusing on one area and the tech could stay in that area rather than moving about.
c. Procedures per day per room below industry norms
d. Scheduling not used to manage productivity, workload smoothing

5. Staffing
a. No clear separation of duties
b. No clear lead person (unless it’s the director). When the director is gone (which has been frequent) its unclear who is responsible
c. Overall productivity & comparison to others seems to indicate overstaffing. Paid hours per exam averages 0.89 while at MCDH it is about double that
d. Staffing level. Based on the number of patients seen and the number of exams given, the department has a greater number of staff than do most hospitals. The relatively small size of the hospital and the wide range of services offered tends to increase the staffing level. Still, if hours or days were reduced as to when each modality was available, it would be possible to run the department with a smaller number of staff.

6. Information system
a. Patient waiting status and patient location difficult to determine. No white board or patient tracking system available
b. Event times reported in MediTech are not accurate, why do it accurately?
c. PACS, support seems problematic, rely on independent contractor for support which may be a risk
d. MediTech – several functions did not seem to work

7. Equipment
a. Certain spaces or exam rooms are crowded
b. New equipment envisioned but economic justification a problem
c. Some x-ray equipment needs update as downtime creates unexpected waiting and/or cancellations. Also, older equipment impacts patient and physician impression of the department

8. Patient centered service
a. Staff not specifically trained in patient centered service or principles of assuring outstanding patient service
b. Staff should understand that - Its your job to make sure the patient has an excellent experience
c. Without the element of making a positive impression to the patient, all other benefits are wasted, particularly related to competition

9. Supervision
   a. Department head complains about non cooperation by department (which seems both inappropriate and counter productive)
   b. Dept heads needs to be more involved in decisions concerning flow of patients and paperwork.

There were general comments about promises regarding upgrades to the facility. This produced a sort of vicious circle (see below). Old equipment and a poor layout discouraged the staff, which in turn resulted on inferior service and dissatisfied patients. These dissatisfied patients did not return which meant lost revenue. The lack of revenue made it difficult for the hospital to upgrade the equipment and improve the building.

![A Vicious Circle](image)

V. Recommendations

Based on the findings and discussion of the findings with the staff, recommendations followed. In order to improve the patient experience and productivity at MCDH there are several interrelated changes. Most of these would be best done simultaneously to minimize the cost and maximize the impact. In particular, the changes in the physical layout, assignment of duties and workflow are all interrelated.

1. Physical space. The impression given for patient visits are less than desirable and staff must do wasteful walking – all due to the current physical layout. The corridor through the middle of the department is inconvenient for both the patients and the staff. The walk from the check in area to the radiology department is confusing to the patient and adds to the communications requirements between registration and radiology. Unfortunately, improving these problems is made particularly challenging due to the cost of making changes to the building. Alternatives include:
   a. Rearrange the current physical layout so that there is a better patient experience, so privacy is maintained and workflow is improved. A better-looking area would improve community word of mouth regarding radiology services. Objectives are:
b. Move the director and others into the center of the x-ray work area so she can better observe and influence the patient flow, assign work, monitor wait time & idle time (if any). A “traffic cop” is needed to keep people doing their specific job, to identify idle time and monitor performance.

c. Move radiology closer to the check-in area. The outpatient building is a nicer environment and radiology represents important revenue producing “customers”. They should be located in an appealing environment and a convenient location. Some of the occupants of the new building and check-in area are meeting rooms, accounting, IT and HR which don’t need to be close to the patient entrance – but radiology does.

i. Some modalities may be expensive to move (such as CT). However mammography and ultrasound are a large portion of the visitors and would be relatively inexpensive to move. Perhaps only they should be moved, or moved first.

ii. As equipment is replaced with new equipment (such as CT), the new item could be located to a better area.

iii. The outpatient waiting area, which is a better environment than the waiting area in radiology, could serve as the radiology waiting area. It appears to be sufficiently large for such an additional purpose.

iv. If radiology were located in the new building, perhaps the MRI trailer could be moved closer to the building that housed radiology and outdoor patient movement avoided.

2. Supervision. The department consists of a professional and proactive staff. However, better results can be achieved with a single coordinator of the flow. Potential changes include:

a. Create a lead tech to act as a “traffic cop” regarding the flow of patients and work assignments, perhaps for use when the director is not there, otherwise the radiology director can serve as the traffic cop.

b. Create a “pull” mechanism for patient flow. When one patient is complete the tech should go get the next one. This already occurs but the traffic cop’s job would be to monitor its effectiveness. Scheduling should be done to assure that a patient is available – so that there is a patient available to pull into the next available time slot.

c. Scheduling function. It’s key to managing the capacity and the demand. Currently it is done by radiology but could be combined with scheduling and could be done in outpatient registration. This should reduce the net amount of staff and should be at least as effective in keeping radiology productive, if not don’t do it.

3. Information. Without accurate and relevant data it is not possible to run an effective radiology service. Currently there is little operational data available to management. Some important data is not available and some available data is not accurate. Some of the difficulty is a result of the limitations of the current information system (MediTech) but
more can be done with what is available now. In order to make the other suggestions effective, better information is required. Changes include:

a. Develop a “dashboard” or productivity tracking system. Make this visible to all staff to encourage performance improvement. Keep it from being overly expensive by limiting the information to what is truly necessary. Data could include:
   - Room utilization
   - No show rate
   - Patient average wait time
   - Patient satisfaction survey results
b. Communications, add clarity to the system, now it (seems) difficult to know what is going on, what patients are waiting, what had been completed
c. Enter actual time data into MediTech. Currently exam times are inaccurate and meaningful results cannot be computed. If this is too cumbersome to be accurate then perhaps it could be done temporarily but otherwise not do it at all. Also, since the needed data is in MediTech the hospital should purchase software that extracts operational results or devise a way to report it.
d. PACS – keep it or replace with standardized one that can connect to MediTech?

4. Staffing
The hospital is trying to become more financially stable. This involves improving the patient volume as a result of good service. Reduced costs are also important.

a. Staffing level could perhaps be reduced, unless patient volume increases. The hospital seems to have 7 to 9 people to serve about 30 patients during the average day. Thus, about 6 patients are seen per employee – too few. That’s about 1.5 hours per exam when 0.89 is average. A reduction of 2 to 4 personnel, or an increase in patient exams, would bring the department in line with industry averages.

b. Reduce hours or days of service for individual modalities. One way to accommodate a reduced staffing level would be to reduce the availability of services.

5. Workflow
Considerable time is taken up when collecting film for an upcoming exam, gathering paperwork, making materials available for a tech, etc. Of course, an all-digital system would simplify matters substantially but a more centralized process with fewer places to assemble materials would be helpful.

a. Conduct a detailed workflow, track in diagram form, all of the steps and see if a layout, which reduces the movement, could be devised. This depends on any layout changes.

6. Create an entirely new space or building. The various rearrangements possible within the existing space is quite limited. Better to develop an ideal layout, which optimizes the various aspects of workflow and patient flow. Management engineering tools are available to analyze the proximity of areas and to select the preferred layout. Systematic Layout Planning can provide a clear and easy analysis set of tools. ¹See Appendix.

7. Other (based on suggestions from the staff)

a. Better signage to direct patients from the check in area to the radiology department.

b. Patient satisfaction survey. Review how it is going. Is it serving the department’s need and could the design be improved? Questionnaire should be in Spanish on the reverse side.

c. More management feedback to staff is needed to help morale.

VI. Implementation

While there was general agreement regarding the recommendations, implementation at MCDH was challenging for several reasons, including:

1. Upgrades to the equipment and building were key and these required a lengthy approval process.

2. Improvement to staff performance required improved supervision, which was limited by the time and ability of the department manager. Upper management agreed (CEO and CMO) but they could not always effectuate the changes.

3. Information systems were limited, particularly the ability to change systems and add new operational reports. Only one staff person knew how to develop queries in MediTech that were needed for a dashboard. She developed such a report but she also left the hospital shortly after the end of this project.

Nevertheless, some improvements were made. These changes were helpful and they seem to be permanent and they also helped the hospital proceed with a new radiology building and the purchase of new equipment. Changes included:

- Dashboard, one has been programmed into MediTech and is available online to all managers (see example in Appendix)
- Patient satisfaction survey, one is implemented and has been in use for several months. See Appendix for a copy of the form used. Sample results for August 07 are shown below.

<table>
<thead>
<tr>
<th>Modality</th>
<th>% Excellent</th>
<th>% Surveys Collected</th>
<th>Patients during 2 weeks</th>
<th>Number of Surveys Gathered</th>
</tr>
</thead>
<tbody>
<tr>
<td>CT</td>
<td>50%</td>
<td>3%</td>
<td>71</td>
<td>2</td>
</tr>
<tr>
<td>Mammography</td>
<td>83%</td>
<td>58%</td>
<td>79</td>
<td>46</td>
</tr>
<tr>
<td>MRI</td>
<td>25%</td>
<td>7%</td>
<td>30</td>
<td>2</td>
</tr>
<tr>
<td>Nuclear Med</td>
<td>0%</td>
<td>6%</td>
<td>17</td>
<td>1</td>
</tr>
<tr>
<td>Radiology</td>
<td>75%</td>
<td>3%</td>
<td>354</td>
<td>12</td>
</tr>
<tr>
<td>Ultrasound</td>
<td>84%</td>
<td>26%</td>
<td>73</td>
<td>19</td>
</tr>
<tr>
<td>Total</td>
<td>79%</td>
<td>13%</td>
<td>624</td>
<td>82</td>
</tr>
</tbody>
</table>

- Measurement of actual procedure time, entering times into MediTech. Staff became aware of the feasibility of doing so and began doing it. This will allow
for better patient appointment scheduling since the average actual time for each type of exam will be known. Previously the appointment time slots used for scheduling purposes were based on the opinions of a previous manager no longer at the hospital.

- Start of new layout based on patient flow analysis. By making it clear to management that this change was an absolute necessity the work has begun. By December 2007 an architect was hired and a location for a separate building for Diagnostic Imaging selected.

Also, the presence of a management engineering study and the focus of attention it generates generally has had a positive effect on productivity. This effect may be temporary but the effect was measurable in the dashboard reports.

Finally, the only way to resolve all the physical problems with radiology seemed to indicate the necessity of a new building. As of early 2008 the hospital hired an architect to design a space to address the problems and recommendations noted above. Funding appears to be available to proceed with such construction and replacing some of the radiology equipment at the same time. Below is an architect’s sketch of a diagnostic imaging building for MCDH.
VII. Appendix

A. Patient Satisfaction Survey Form

We are committed to providing the highest level of Diagnostic Imaging services. We want to know about your visit so that we can improve further. Please rate the following aspects of our service.

Today’s Date: ____________

<table>
<thead>
<tr>
<th>Rate your experience in Diagnostic Imaging:</th>
<th>Excellent</th>
<th>Very Good</th>
<th>Good</th>
<th>Fair</th>
<th>Poor</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overall level of satisfaction</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>Registration process</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>Check-in within the Diagnostic Imaging department</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>Satisfaction with the diagnostic imaging procedure</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>Courtesy &amp; respect during diagnostic imaging procedure</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>Overall teamwork between staff</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>Physical appearance of our department</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
</tbody>
</table>

If you rated any of the above as “Fair” or “Poor,” please explain why:

__________________________________________________________________________________
__________________________________________________________________________________
__________________________________________________________________________________
__________________________________________________________________________________

Questions about the wait time you experienced:

<table>
<thead>
<tr>
<th>Circle one:</th>
<th>5-10 minutes</th>
<th>10-15 minutes</th>
<th>15-20 minutes</th>
<th>20-30 minutes</th>
<th>30-45 minutes</th>
<th>45+ minutes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Time between arrival &amp; registration</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Time between registration &amp; your diagnostic imaging procedure</td>
<td>5-10 minutes</td>
<td>10-15 minutes</td>
<td>15-20 minutes</td>
<td>20-30 minutes</td>
<td>30-45 minutes</td>
<td>45+ minutes</td>
</tr>
</tbody>
</table>

Have you gone elsewhere for Diagnostic Imaging services within the past two years?

☐ Yes   ☐ No   If yes, why?   ☐ My doctor referred me there
☐ Insurance coverage
☐ Convenient location
| □ Cost |
| □ Other: ____________________________________ |

What is the likelihood of recommending MCDH Diagnostic Imaging services to others?

<table>
<thead>
<tr>
<th>Excellent</th>
<th>Very Good</th>
<th>Good</th>
<th>Fair</th>
<th>Poor</th>
</tr>
</thead>
</table>

Other comments or suggestions?

___________________________________________________________________________
___________________________________________________________________________
___________________________________________________________________________
___________________________________________________________________________
B. Building Layout
MCDH Layout and possible revision of existing space.

C. Layout Analysis

For a new building proximity analysis is suggested. For example:
“A” means areas should be adjacent, X means they are best further apart, U means unimportant and O means OK but not highly important. Once area sizes are determined alternative block plans can be considered, such as:

Alternative No. 1

The desirability of each alternative block plan can be measured based on travel distances, costs or other metrics. The least costly alternative can then be selected as the best arrangement of building areas.

D. Dashboard Report

Below is an example dashboard report for MCDH.

Last week, day shift:
E. Notes from meeting 3/21/07 with radiology staff.

The meeting was held with MCDH Diagnostic Imaging (radiology) staff (8 people) plus the radiologist Dr. ____, the acting CCO, and myself. The results, thus far, from the patient satisfaction survey were distributed. The meeting was friendly with lots of animated discussion. Much of the meeting involved complaints but it was steered towards a discussion of suggestions.

Complaints comments include:
1. “Management doesn’t pay attention to us”. The department staff said they had complained and told “management” about problems with equipment and the space but nothing happens. Sometimes promises are made but they are not followed. Felt management does not listen.
2. The tech work area is not separate from patients and patients see work and papers that are not appropriate are not helpful to patient satisfaction.
3. Equipment is inferior, old and hard to repair, unreliable. Most often mentioned was fluro, X-ray, ultrasound table. Dr. ____ in particular was vociferous about this.
4. There was disagreement as to the need for a better CT. Dr. ____ questioned the high priority of a replacement.
5. Appearance of the facility is bad. This is a result of several factors:
   a. Crowded waiting area with poor wheelchair access
   b. Old looking
   c. No TV in waiting room
   d. Room 2 is too small (remodeling has been discussed)
   e. No CT washroom
   f. X-Ray work area presents HIPPA violations
   g. Structural wall is damaged in room 1
   h. Dressing rooms in wrong location, not private due to fact that patients must walk through X Ray work area (which is open to public corridor)
   i. No MRI dressing room, covered walkway to MRI needed
6. Some staff tell the patients to complain about the equipment so that their voice will be added to the call for better equipment
7. Regarding the patient satisfaction questionnaire, some techs did not know about it or were uncertain about the purpose.
8. Need covered walkway to MRI which is outside
9. Separate registration area makes things problematic. Some had the impression that MediTech requires this.
10. Wait time may be a problem but some staff felt that patients over estimate the length.
Suggestions from staff included:
11. Modernize area and equipment
12. Have a receptionist or clerical person to answer phones, an additional person
13. Improve signage from the registration area to guide patients to radiology
14. Use floor stripes to guide patients to radiology
15. Have a volunteer, aid or non-tech person to guide patients, perhaps as a “greeter” at the check in area. This may reduce patient wait time. It was also suggested that such a person should speak Spanish.
16. Room 2 should be remodeled, it looks bad and is in need of repair
17. Give the patient evaluation form with a clip board.
18. Move corridor so that it no longer bisects the department
19. Improve staff attitude to improve patient satisfaction
20. Move a registration person to radiology office
21. Print backside of questionnaire in Spanish
22. Weight limitation sign should be on all machines (apparently it was but they were somehow removed)
23. An internal email, within radiology would be helpful. Could be used to post messages for shift change communications.
24. Recognize Tech Week (like nurses week)

It seemed to be generally recognized that there is a vicious circle; poor equipment results in poor staff morale, which results in poor patient satisfaction, which harms patient volume, which harms funding for new equipment.

It seemed to me that this meeting needs a follow up; to have management respond to the concern that radiology staff is not being listened to and a response to complaints about conditions.