THE EVOLVING HEALTH CARE DELIVERY SYSTEMS:
APPLYING THE PROCESS HANDBOOK METHODOLOGY TO GAIN A
VISION OF THE FUTURE

by

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Submitted to the Alfred P. Sloan School of Management
in Partial Fulfillment of
the Requirements of the Degree of
Master of Science in Management

at the

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ABSTRACT

This thesis follows the process of providing breast cancer treatment to a patient through three phases of the health care delivery process: prevention, intervention and recuperation. This investigation focused on the individual components of the treatment process, and how they related to one another. The Center for Coordination Science developed the Process Handbook methodology for use as the analysis tool. This project was one of several thesis research studies conducted concurrently. The goal was to populate the Process Handbook database with real business process maps, to exercise and expand upon the capabilities of the Process Handbook software, and to compare process components across sites and industries.

Describing the breast cancer treatment process is the main focus of this thesis. A secondary analysis of managed care vs. fee for service insurance schemes is included, based upon the professional opinions of the experts with whom we spoke. The results include detailed process maps, dependency analysis and a description of the environment within which patients receive treatment.

There is no way to prevent breast cancer. Finding the disease early in its existence is the best way to guarantee long term survival, with regular breast exams and mammograms being the primary methods of early detection endorsed today by the medical community. From the time the patient receives a baseline mammogram, through detection and active intervention, multiple actors assist in the attack on the disease. Multiple health care institutions serve the patient's needs. This thesis addresses how various interested parties create and maintain relationships, and how they resolve coordination issues that arise in providing care to a patient.

Thesis Supervisor: Thomas W. Malone

Title: Patrick J. McGovern Professor of Information Systems
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I could not have conducted or completed this thesis project without contributions from many people. I would like to thank all of the members of the local Health Care community who took the time to speak with us. Their patience as we tried to understand the complexities of the process selected was immeasurable. In particular, I would like to thank Geoff Cole, The Chief Executive Officer of Emerson Hospital, for helping us define the project and for providing us with many of our contacts and research sources.

The members of the staff of the Center for Coordination Science offered endless hours of support. Many thanks to our site advisor, Fred Luconi, for his advise and support; to Charley Osborne, for his insights into the Health Care System; to John Quimby for helping us to understand the process handbook software and methodology; to George Wyner, for his continuous support and patience; to Avi Bernstein, for responding so quickly to all of our programming requests; and finally to Tom Malone, without whose guidance, vision and dedication to the Process Handbook and to us, this project would not have occurred.

I would also like to thank all of my fellow structured thesis students. The insights and experiences shared over the course of the semester added depth to my own conclusions and understanding. And finally, thank you to Wilder Leavitt, my research partner for this project, whose patience and equanimity were constant and very much appreciated. I could not have completed this thesis without his sharing of his intellect and perseverance.
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CHAPTER ONE - INTRODUCTION

1.1 Project Overview

This thesis is but a small contributor to a larger research and development project being undertaken by the Center for Coordination Science (CCS). The Process Handbook, a software tool and methodology, is the primary tool used to analyze the results of our research efforts. It is the hopes of the developers that utilization of this tool by researchers and thesis investigators will create a database of processes, addressing both specific and top-level or generic activities. Careful dissection and mapping of these processes will allow users to gain insights, as they study individual constraints and limitations. Applicants can then apply these insights to other processes, in both like and unrelated functions and industries. The end result is a tool and database that can contribute to the next phase of evolution in the life cycle of organizations as we know them today.

"This project responds to the challenge of 'inventing' new organizations in two ways: (1) by collecting, organizing, and analyzing numerous, interesting examples of how different groups and companies perform similar functions, and (2) by developing new methodologies for representing and codifying these organizational processes."1

1.2 Project Goals

The project began with several goals outlined. Primarily, we wanted to capture a process. A group of students working with members of the CCS began to look across industries and business practices for unique processes to investigate. The end goal was to map the processes, breaking each down into individual activities and tasks. How can a process done in different ways be actively represented? We then conducted a dependency analysis. Insights into particular issues or problems within the specific process, or for related processes are sought. Are there dependency or coordination issues that come to life when analysts map the process into its simplest form? One goal is the creation of process models that can break down organizational and functional traditional barriers, and create models that are understandable, transferable and applicable to interested parties.

1.3 Topic Selection

Recent efforts to begin the reformation of the health care delivery system in the United States brought to the public eye the many ways in which the current environment fails the public, both those it does and does not actually serve. This renewed attention, coupled with my own professional background in the health care information systems industry, led me to seek a project which investigated and addressed some health care related issue. We were fortunate to gain direct access to a local area health care facility, Emerson Hospital in Concord, Massachusetts. The Chief Executive Officer, Geoff Cole,

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1 MIT Center for Coordination Science, Process Handbook Field Studies, "Overview for Prospective Field Sites", November 1994
generously assisted us in defining which specific component of the health care delivery process to investigate.

We decided to look at two organizations trying to provide like services under different models of care. We sought a single process that branched across inter and intra organizational boundaries. Eventually we fine tuned the original idea: rather than two separate organizations, we would looked at two separate types of insurance coverage, a key component in the governance of patient care, paying close attention to how it effects patient care. Are patients falling through the cracks? We wanted to relate structural differences to performance and outcome differences. How do hospitals themselves link different practitioners to the patient? What coordinating mechanisms do the actors require, both those in place and those required and desired?

The duration of our thesis project was approximately four months, obviously not enough time to investigate the entire health care delivery system. Focusing on a single malady would allow us to limit the scope of our research, and gain deeper insights into a representative component of the process. We divided the delivery of most health care services preventative, interventional, and recuperative medicine. We wanted to follow a malady that crossed multiple organizational and specialty boundaries. The malady chosen would ideally allow us to follow a patients’ care through all three of these segments of treatment. We selected the prevention, diagnosis and treatment of breast cancer.

In line with the goals of the CCS and the Process Handbook, we focused on the organizational structures encountered. Do different types of organizational forms found throughout the health care system make a difference in the treatment a patient receives? In addition, we began our study paying close attention to the roles of information systems and incentives in the health care delivery system. As the reader will see, while these are indeed important factors in the health care delivery process, we found many other determinants to be of equal importance to those delivering care. The system as a whole can not succeed without addressing all of the component issues.

As one of our interviewees mentioned, had we selected a less publicized malady, our results would have been very different. We had expected to see major differences in the way providers treat managed care and fee for service patients. What we found was quite the opposite. Clinicians and administrators alike claim that there is no clinical difference in the way patients are being treated, that for the most part it doesn’t matter what insurance coverage a patient has. We have no evidence to indicate the contrary. Had we selected another treatment process to investigate this would likely not have been the case. The treatment of breast cancer has generically accepted components, which is not true for every malady. Given time, I would have liked to have investigated a second malady, one for which the practices patterns are not nationally recognized by both patient and providers.
1.4 Site Selection

We focused our research efforts on three local sites: Emerson Hospital, Acton Medical Associates and Concord Hillside Medical Center. Both of the medical centers are outpatient facilities for whose patients Emerson provides inpatient services when necessary. Exhibit 1 contains more publicly available descriptions of each of the three institutions.

These institutions serve a patient population covered by a wide variety of insurance companies and plans. Acton Medical Associates treats patients with multiple types of insurance coverage, including from several different Health Maintenance Organizations (HMO) and individual commercial coverage. Concord Hillside has an exclusive contract with a single local HMO. They treat commercial insurance patients as well, but arrange no other HMO contractual relationships. Emerson Hospital treats patients covered by all types of insurance, and has contractual relationships with numerous outpatient facilities to provide services for their patients. In the course of our research, representatives from inpatient, outpatient and HMO facilities were contacted.

1.5 Thesis Outline

Chapter Two is a collaborative effort and will provide background on the Process Handbook methodology and software. In order to provide an understanding of the malady we chose to investigate, Chapter Three defines breast cancer and describes recent treatment practices. Chapter Four will focus on our actual research and how we conducted it, as well as describe the process maps we were able to generate. Chapter Five looks at some of the coordination and dependency management issues that arose through the course of our analysis. Chapter Six examines differences in the breast cancer treatment process in two kinds of payment schemes: Managed Care and Fee for Service. Chapter Seven outlines some of the efforts that currently under way directed at the future. And finally, Chapter Eight summarizes my conclusions.
CHAPTER TWO - METHODOLOGY: HISTORY AND FORMATION

2.1 Center for Coordination Science

The Center for Coordination Science is a research center associated with the Massachusetts Sloan School of Management. Its efforts focus on studying present organizational forms, and how these forms are being altered due to the proliferation of technology and the "virtual" concepts now being embraced. Researchers pay particular attention to the coordination mechanisms existing in organizations, and how these are changing with the rapidly advancing technological driven society in which we live.

"There is a growing feeling among business leaders, academics, and others that the old ways of doing business aren't working anymore...As a basis for imagining plausible future organizations, we propose to use three primary research approaches: (1) studying innovative organizations of today, (2) experimenting with new technologies that will enable the organizations of tomorrow, and (3) developing new theories about how work can be organized."\(^3\)

The development and implementation of the Process Handbook tool is just one of the many projects being conducted by the members of CCS to address questions about the uncertainty of future organizational structures and potential. Numerous visiting scientists, Ph. D., masters and undergraduate candidates all contribute to the research and results being obtained by CCS. CCS dedicates both part and full time staff members to following the research and development visions of the founding constituents. Professor Tom Malone, Visiting Scholar Fred Luconi, Visiting Scholar John Quimby, Assistant Professor Charley Osborne, Doctoral Candidate George Wyner, Avi Bernstein, and Systems Administrator Stephen Buckley were all active members of the professional team with whom we worked. Without their efforts and quick responses to our questions and concerns, I could not have completed this thesis project.

The work performed at CCS focuses its investigations on three project areas:

- organizational structures: how people work together and how this may change with new information technology;
- coordination technology: the design and studies of innovative computer systems that help people work together in small or large groups;
- coordination theory: the development and testing of theories concerning how coordination can occur in a variety of systems, such as human organizations, markets, and computer networks. Expertise from a variety of fields, including economics,

\(^2\) This chapter was jointly written by myself, William Lyons and Emily Breuner, Sloan Masters' Candidates. Versions of it appear in all three of our thesis. Many thanks to them both for their contributions

\(^3\)Massachusetts Institute of Technology, Sloan School of Management, "Inventing the Organizations of the 21st Century", September 1994
computer science, organizational theory, information systems, management science, and psychology are incorporated.  

2.2 Coordination Science

Coordination science is the interdisciplinary study of coordination in many kinds of systems. The Process Handbook methodology utilized to complete this thesis project breaks activities into sub-activities, then studies the dependencies between them. The CCS hopes that by classifying these dependencies between the individual activities within a process, patterns of coordination and resource utilization will emerge, upon which theories of effective dependency management can be based. For the purposes of this project, coordination refers to the management of the dependencies. I will describe each of these steps involved in examining the true coordination mechanisms found in processes in more detail below.

Of particular interest to the CCS and today’s business leaders is how information technology creates new opportunities for coordination. To understand the effects of information technology on an organization and coordination costs, investigators have developed a predictive framework with three orders of effect:

- First order effect: automation - information technology will automate coordination tasks and substitute for human activity;

- Second order effect: increased coordination - information technology gets applied to coordination so as its costs go down, the overall amount of coordination may increase;

- Third order effect: coordination intensive structures, which will arise as costs decline and adoption spreads more "coordination-intensive" structures may evolve.  

These effects result in the, “prediction that information technology should lead to an overall shift from internal decisions within firms (or vertical integration) toward use of markets to coordinate economic activity.” Extending this thought, the article discusses improved coordination mechanisms endanger intermediary organizations (such as stock brokers or distributors) that rely on market inefficiencies.

In aggregate, these effects have several implications: operations that require a great deal of coordination (virtual corporations, geographically dispersed teams, etc.) may become possible; and, the scale of a coordinated activity can increase dramatically.

"Diverse methodologies of systems thinking have been developed over the past 40 years. Yet, despite widespread recognition of the growing importance of understanding

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4 Center for Coordination Science Research Overview, http://www-sloan.mit.edu/ccs/research.html
interdependency and change, there has been relatively little penetration of these methods into the mainstream of management practice."³ The Process Handbook is being designed and developed in the hopes that it will provide a valuable tool for use in actual organizational situations. Investigators develop theories over time as to how best to change or even re-engineer organizations. The trick is in determining methodologies that will allow such transformations to occur.

2.3 Development of the Process Handbook

In order to advance the study of coordination science, the CCS developed methods for representing, classifying, and then analyzing processes in terms of their ability to coordinate, i.e. manage dependencies. Out of this work has come the Process Handbook. "If we are ever to understand successful organizational processes, we must be able to recognize and represent the organizational processes we see. And in order to improve organizational practice in a particular situation, we must also be able to imagine alternative ways of accomplishing the same things."⁴

The first phase of development focused on the representational methodology and software support. Refinements in these areas continues. The second phase of the development focuses on collecting example processes from organizations. This latter phase generated this structured thesis project. By comparing these dependency managing processes and by having a catalog from which to chose established processes, CCS intends the Process Handbook to help "(a) redesign existing organizational processes, (b) invent new organizational processes that take advantage of information technology, and perhaps (c) automatically generate software to support organizational processes."⁵

The goals of the project are:

- Create theoretical tools to help "invent" new organizational processes, especially those enabled by information technology;
- Create practical tools to help (re)design organizations rapidly and effectively;
- Teach students about organizations and organizational design;
- Generate automatically software to support the processes.

2.4 The Process Handbook Methodology

The Process Handbook attempts to represent and catalog varied business processes to achieve two goals: to help theoreticians imagine new organizations and to help consultants, managers, and others understand and redesign existing organizations. The

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⁵ Ibid.
key challenge is devising a notation or representation method for describing processes in such a way that they can be indexed and clearly understood. In order to do this, the process handbook leverages ideas of inheritance from software design and dependency management from coordination theory. The sections below elaborate on the terminology, representational tools and the analysis methods from the Process Handbook.

"The analytic way to address a complex situation is to break it into components, study each component in isolation, and then synthesize the components back into a whole. For a wide range of issues, there is little loss in assuming a mechanical structure, and ignoring systemic interactions."\textsuperscript{10} The first step in using the Process Handbook methodology is the mapping of processes into individual activities or tasks. A process is a set of activities to accomplish an objective, or a single stand alone activity. An example would be "provide medical treatment for a patient". "We assume that all processes can be thought of as a set of activities (e.g. 'steps', 'tasks' or 'sub processes')"\textsuperscript{11}

The methodology allows the examiner to describe each activity in terms of the actors involved, the resources required, the goals and the artifacts produced, essentially the inflows and outflows required and produced by each element of the process.

Decomposition

Investigators then decompose each step in the process, essentially identifying and splitting an activity into component sub-activities. This procedure can go through several iterations to further decompose sub-activities into their constituent activities. In general, decomposition of an activity represent Boolean "and" relationships. To complete an entire activity, actors must execute each of its components or sub-processes. For example, the activity "answer questions for patient" includes several sub-activities, such as "make contact with patient" or "gather information for patient". The result is a hierarchical representation of the entire process.

"Decomposition is a time honored way of dealing with complex problems, but it has big limitations in a world of tight couplings and nonlinear feedbacks. The defining characteristic of a system is that it can not be understood as a function of its isolated components:

- The behavior of a system doesn't depend on what each part is doing but on how each part is interacting with the rest;
- To understand a system we need to understand how it fits into the larger system of which it is a part."\textsuperscript{12}

It is my conjecture that this holds true for the individuals components of activities as well as entire systems. Each of the individual operations may be independently completed.

\textsuperscript{10}Senge, Peter M., Kofman, F., "Communities of Commitment: The Heart of Learning Organizations", 1993, 03.020


\textsuperscript{12}Senge, Peter M., Kofman, F., "Communities of Commitment: The Heart of Learning Organizations", 1993, 03.020
But without consideration of the other activities, the top level procedure can not occur, at least not in an optimal manner. In addition, the individual sub-processes can potentially lose some of their own value.

Analysts decompose the process where possible to the lowest level of the hierarchy. “As we get lower down in the hierarchy, things become more like actions and less like objectives.”

The end goal is the break down of a process into generic sub-routines of activities in a process, to link and compare with other processes, i.e. re-using sets of components elsewhere in the Process Handbook.

Specializations

For many activities, there are more than one way of completing the task. In general, specializations represent Boolean "or" relationships. Specializations offer alternate processes to accomplish the same activity. For example, practitioners can perform the activity “make contact with patient” in several ways, each a specialization: talk to patient on the telephone, see patient in person, receive written request from patient. “In general, specialization can be used to indicate alternative ways of performing an activity.”

A high-level activity may decompose into generic sub-activities. The specializations of the high-level activity each inherit a copy of the activity’s decomposition, i.e. the generic sub-activities. Thus each specialization starts with a basic decomposition. These get modified to reflect the unique characteristic sub-activities of each specialization. Thus in the “answer questions” example above each of the specializations (respond to patient in person, respond to patient over the telephone, respond to patient in writing) would inherit the sub activities “make contact with patient” and “gather information for patient”.

Inheritance

As investigators map the processes, certain activities "inherit" the characteristics of the parent activity. This term adopts the meaning used in traditional object-oriented computer programming. In this paradigm, researchers create different classes. Each class has a set of characteristics automatically “inherited” by any sub-class or specific object created in that class. Sub-class start with the common characteristics yet may be modified with further characteristics. Objects “inherit” characteristics from those above them in the hierarchy. These characteristics form a modifiable base of common elements. For example, in the process to be described in this thesis, "diagnose patient" is one of the decompositions of "provide medical care". Providing surgical, radiological and oncological diagnosis (specializations) all have "prepare patient" as the first decomposition, as does the parent generic process.

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13 Professor Thomas W. Malone, November 6, 1994

Dependencies

Following the completed mapping of the process, investigators perform a dependency analysis. Dependencies describe the linkages and constraints existing between activities in a process. How does the way in which actors perform one task effect the others? Of particular note, each dependency requires some method of coordination in order to be useful and used as a component of the larger process.

The following table displays the types of dependencies the Center for Coordination Science has identified:

<table>
<thead>
<tr>
<th>Dependency</th>
<th>Examples of coordination processes for managing dependency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shared resources</td>
<td>“first come/first serve”, priority order, budgets, managerial decision, market-like bidding</td>
</tr>
<tr>
<td>Producer/consumer (Prerequisite constraints)</td>
<td>notification, sequencing, tracking</td>
</tr>
<tr>
<td>Producer/consumer (Transfer)</td>
<td>inventory management (e.g., “Just In Time”, “Economic Order Quantity”)</td>
</tr>
<tr>
<td>Producer/consumer (Usability)</td>
<td>standardization, ask users, participatory design, concurrent engineering</td>
</tr>
<tr>
<td>Simultaneity constraints</td>
<td>scheduling, synchronization</td>
</tr>
<tr>
<td>Task/sub-task</td>
<td>goal selection, task decomposition</td>
</tr>
</tbody>
</table>

Table 2.1 Examples of common dependencies and alternative coordination processes

As stated above, it is the management of dependencies that constitute the concept of coordination. Once analysts have identified the dependencies, the task then becomes to examine the relationships between them, and how actors manage these relationships. For instance, with a shared resource dependency, who decides how to allocate the resource among interested parties? In the breast cancer treatment process for example, the amount of time a patient would like to have with a provider may not be the same as the provider has to give, or the insurance company is willing to financially cover. Who decides how much time a provider spends with a patient?

To aid in making such decisions, the Process Handbook methodology uses the concept of a trade-off matrix. The matrices will compare different alternatives for like activities, based upon the goals of a given actor. "This tradeoff matrix can also include detailed justifications for the various ratings. In some cases, these trade off matrices may be the result of systematic studies; in others they may be simply rough guesses by

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knowledgeable managers or consultants; and of course in some cases, there may not be enough information to include any tradeoff matrices at all.\textsuperscript{16}

\subsection*{2.4.1 Process Handbook Representation Tools}

\textit{Activity Lists}

An activity list is simply a chart that provides opportunity to define the elements of the activities. Table 2.2 shows a basic blank activity list. For each activity we attempted to identify all associated actors, goals, resources required and artifacts. Also included for each activity are the types of associated dependencies identified, activity upon which it depended, resources, and the coordination mechanism(s).

\begin{table}[h]
\begin{center}
\begin{tabular}{|l|l|l|l|l|}
\hline
Activity & Actor & Goal & Artifacts & Context \\
\hline
\hline
\end{tabular}
\end{center}
\caption{Sample Activity List}
\end{table}

\textit{Process Maps}

These are graphical representations of processes, showing objects arranged in a hierarchical network with general activity categories at the top and increasingly specialized kinds of sub-activities as objects at lower levels. Decompositions flow down the map, as is demonstrated in the diagram below by “determine $\$” and “give $\$”. Solid lines represent this hierarchical flow. The Process Handbook represents Specializations with dashed lines between components, which flow to the right (in this diagram, though further down in the process handbook software, specializations are drawn ‘down’), such as is the case with “pay cash”, “pay check”, and “pay credit card” below. A heavy arrow shows the dependency between sub-activities. These arrows do not give any indication of what type of dependency exists between the sub-processes. The issue of how to visually represent the different dependency types has to my knowledge not yet been resolved, though the use of color is currently being explored.

\begin{figure}[h]
\centering
\includegraphics[width=\textwidth]{sample_process_map.png}
\caption{Sample Process Map}
\end{figure}

Items displayed in bold font have further decompositions. As mentioned above, specializations inherit the two sub-activities (though not shown in this diagram). For example, “Pay Cash” decomposed into “determine $”, and “give $”.

2.42 Analysis

Documenting processes allows close examination of how resources operate together. The analysis enabled by the Process Handbook maps look for and at best practices and provides a vehicle for speculation of how people might work together differently with new kinds of information technology and process structures. Diagramming a process surfaces the dependencies between activities. Analysts can identify and represent the processes used to manage those dependencies. The Process Handbook serves as a library to collect processes by providing a common taxonomy. After mapping a process, analysis of the activities or of the dependencies may reveal opportunities to improve the process’s effectiveness in accomplishing its objective.

2.5 The Process Handbook Software

CCS employed (employs) several students and professionals to develop an application that can portray process maps and contain activity lists and description screens for each object (process, activity, specialization, or dependency) within the maps. Visual Basic, a Microsoft Windows development tool, serves as the development platform for this application. There are currently two versions available, one for Windows, the other for use on the Lotus notes database. The version we are currently using is an advanced beta software version. The product developers have responded extremely quickly to our requests and suggestions for modifications.

2.51 Screen Layout

The diagram below is the first screen displayed when entering the Process Handbook application. The goal is to be able to organize and map all processes into four general top level categories, as shown. For the purposes of our research, we added “Provide Medical Care” to the “Do Business” division. The process handbook software makes it very easy to walk through any hierarchical tree, expanding and retracting any view easily. The database that is in the process of being populated will no doubt grow to be enormous. One challenge that remains is the creation of an effective “browser”, which would enable a user to quickly locate a process of interest.
2.52 Personal Contributions to the Process Handbook Tool Development

The Process Handbook software is currently in an advanced Beta testing stage. It is being used to populate the database. There are changes being made to the software on a daily basis. It promises to be an evolutionary state of the art tool. During the course of conducting our analysis of our research, we had the opportunity to test the capabilities of the software. It was impressive. Exhibit 2 is an example of an email sent to the software designers following one of the data entry sessions.

Using the Process Handbook software, we were able to successfully map our processes. Our research raised questions along the way regarding how to depict activities that occur on an ongoing basis, more or less independent of other activities. For example, practitioners provide counseling to patients throughout the breast cancer treatment process, at all times during multiple stages of the treatment plan. We discussed how best to represent such activities using the Process Handbook tool.

There was some confusion as to whether or not the order of activities listed in a decomposition necessarily mapped directly to the timing sequence of those activities. In our process for instance, clinicians can not provide treatment unless they at some point receive financial reimbursement. Some insurers, such as Health Maintenance Organizations, provide payment to providers before treatment, paying a monthly membership fee, while fee for service commercial insurers generally pay only after clinicians actually provide treatment. The decompositions of these two methods look the same. It is in the dependency analysis after investigators have indicated the flow dependencies that timing differences become apparent.

The exercise of mapping raised the question of how to represent human factors using the Process Handbook tools. In the treatment of breast cancer for example, providers make decisions as to when to perform certain activities in part based upon the "hysteria level" of the patient. Is this a new type of dependency perhaps, the condition of certain actors or factors? In addition, the health care delivery system today involves a complex approval process, requiring permission to perform treatment prior to actually doing so. Another new type of dependency perhaps, "approval", which insures and aids in quality assurance and resource management. In the health care treatment process, providers may complete activities which require approval without it, but, not without repercussions, such as legal action or non-reimbursement of funds.
CHAPTER THREE - THE BREAST CANCER TREATMENT PROCESS

Before proceeding with the description of the methods used to conduct our research, and the results, it is important to provide an overview of breast cancer, and current national treatment trends. We had originally hoped to examine our process through examination of patient medical records. Due to issues of patients confidentiality, this was not an option. Instead, we focused our efforts on mapping the basic process involved in breast cancer: prevention, diagnosis, treatment and follow-up care. In addition, we investigated non-clinical processes that are key components of the health care delivery system.

3.1 Breast Cancer

"Breast cancer is the most common type of cancer among women in the United States." 17 An estimated 182,000 women developed breast cancer in 1994, and approximately 46,000 women died of this disease during that year. According to the American Cancer Society, breast cancer:

- is one of the leading cancer killers of women;
- effects one in ten women;
- occurs in 1,000 men in the United States each year
- is more likely to happen to women:
  * over age 50
  * who have other family members with cancer
  * who have never had children
  * who were over 30 when they had their first child. 18

"Breast Cancer incidents rates for women have increased about 2% a year since 1980, but recently have leveled off at about 108 per 100,000. Most of the recent rise in rates is believed to be due to marked increase in mammography utilization. Other reasons for a long term increase in breast cancer are not yet understood." 19 The following chart shows the increase in the number of breast cancer related deaths in the United States over the past 35 years, although "from current data, based on women diagnosed in the early 1970's, the long-term breast cancer survival rate is 50%" 20, a figure some medical professionals consider to be quite promising.

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17 National Cancer Institute, "What You Need To Know About Breast Cancer", U.S. Department of Health and Human Services, Public Health Service, National Institutes of Health

18 American Cancer Society, "Cancer Facts for Women", 90-1.5MM- No. 2007

19 American Cancer Society, "Cancer Facts & Figures 1994", 94-375M-No. 5008.94

20 Ibid.
Thirty year trends in Cancer Death Rates per 100,000 population 1958-1960 to 1988-1990 21

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<td>27.4</td>
<td>7%</td>
<td>23,755</td>
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3.2 National Awareness

Standing in line at the grocery store, and glancing over the numerous magazine covers strategically displayed, one will almost always find at least one article listed involving breast cancer: who has it, which gene scientists believe is the culprit, preventative measures, etc. Self Breast Exams and mammograms are procedures with which most women (at least here in the United States) are familiar. Brochures and informational literature is ubiquitously available. Reminders are everywhere. The Cancer Information Service has gone so far as to establish an 800 number where information about breast cancer is available, in both Spanish and English. As a result of these efforts to educate and inform women nationwide "nearly 9 out of 10 women could survive it [breast cancer]." 22

"Recent media attention to breast cancer has enhanced public and professional awareness of the familial nature of this disease. Such knowledge is essential for cueing and motivating screening behaviors. However, among women with a family history of breast cancer, this heightened awareness can have potentially untoward consequences. A substantial proportion of these women have exaggerated perceptions of their personal risks that, in turn, can generate unnecessary anxiety. Researchers have shown that perceived susceptibility and accompanying anxiety interfere with adherence to breast cancer surveillance regimes, possibly as a result of efforts to reduce one's focus on the threat of breast cancer. 23 All of this media attention had an effect on the results of this thesis, as will be discussed further.

3.3 Breast Cancer Treatment

"Breast cancer is a major, and increasing, public health problem in the United States and most other industrialized countries. Since there is not yet an established means of

22 Ibid.
23 Lerman, Carol, Lustbader, Edward, Rimer, Barbara, Daly, Mary, Miller, Suzanne, Sands, Colleen, Balshem, Andrew, "Effects of Individualized Breast Cancer Risk counseling: A Randomized Trial", U.S. Department of Health and Human Services; Journal of the National Cancer Institute, February 15, 1995, pages 286-292
preventing breast cancer, efforts to combat the disease have focused on early detection through screening to increase the success of existing treatment.”

Breast Cancer treatments are similar on some levels throughout the world. We based the descriptions and process maps developed throughout the course of this project upon personal experience, nationally available publications, and interviews with specialists from each portion to the treatment process. Exhibit 3 contains a brief, written, very basic description of the diagnosis and treatment of a breast cancer patient. The treatment of breast cancer is dynamic, changing on a regular basis. For example, the current issue being discussed by the medical community regards the frequency of mammograms: how often should a woman have them done, how often is truly medically necessary and when are the tests considered to be excessive? But there are not national standards, no one single prescribed treatment pattern or methodology. Should there be?

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CHAPTER FOUR- THE RESEARCH PROCESS

The research undertaken to develop this study and to provide robust results for CCS's Process Handbook followed a traditional process of reviewing literature in the field, gathering data about the site, and conducting interviews. In addition, I needed training in the Process Handbook methodologies and tools. Understanding the philosophy behind the tools is mandatory for successful utilization. The Process Handbook is more than just a mapping tool. It has the potential to provide a valuable framework through which investigators can examine, analyze and improve established processes.

4.1 Literature Review

Working articles and final publications by the Center for Coordination Science provided most of the background information about the Process Handbook and research methodologies. Literature searches provided a vast array of articles relating to all aspects of the health care arena. As both the health care arena and the treatment of breast cancer are rapidly changing and have recently been in states of transition, the focus of my search was on recent articles and reports. Interestingly, several related articles appeared in the Boston Globe during the course of our research, an indication of the timeliness of this research area. The American Cancer Society generously provided us with recent publications. Finally, for formatting, and approach models, I referenced the thesis of former students involved in the Process Handbook project.

4.2 Interviews

We conducted interviews with representatives from each of the three institutions with whom we worked, paying special attention to insure that we interviewed members of both the administrative and clinical side of health care delivery. We contacted primary care physicians, nurses and specialists in the hopes of getting a complete clinical picture of the treatment process. We approached several administrators, as were non-clinical members of the health care team. Professor Malone asked our fellow students working on the structured thesis process to provide insights and descriptions of the processes upon which they were focusing, in the hopes of benefiting from similar mapping methodologies and generic processes identification. Appendix B contains all of the interview notes. For the most part, as we began the interviews we would explain the purpose and scope of our project, and ask the subject to describe his or her role in the chosen process. We asked each to highlight differences in care that he/she would attribute to a patients’ insurer. Exhibit 4 contains a sample of the questions asked during the course of an interview.

4.3 Applying The Process Handbook

4.31 Process Maps

We documented and consolidated interviews as we conducted them. We began making process maps from the very beginning of the project. There were uncountable versions of the documents created, with each a new skill, expertise or insight into the capabilities of the tool gained. We attempted to capture the top level activities of each process.
Realizing that we did not have the time available to us to do detailed decompositions and specialization breakdowns of every component of the process, our entries into the Process Handbook map the process in a general sense. We attempted to capture all of the major activities required in the breast cancer treatment process. Any omissions are not intentional.

Appendix C contains our process maps. These are the top level activities, decompositions and specializations found throughout the treatment of Breast Cancer. Most of the processes are of a clinical nature, though there are some administrative components included. The maps attempt to follow the treatment process through preventative, interventional and recuperative care. Each map is representative of and employs the process handbook methodology. For example, "provide medical care" breaks into 5 basic decompositions, each of which then further decomposes into its component tasks:

- Collect payment;
- Perform case management;
- Provide early detection;
- Provide medical intervention;
- Provide recuperative medical care.

To illustrate the concepts of specializations and inheritance, examine the fifth process map. We decomposed the activity "provide medical care" into four activities:

- Diagnose patient;
- Select from treatment options;
- Perform Intervention;
- Move Patient.

There are then, for example, six specializations of "diagnose patient", one for each the triage nurse, primary care physician, radiologist, oncologist, surgeon and pathologist. Each of these specializations has inherited from the parent activity ("diagnose patient") the next level of decomposition:

- Review chart;
- Question patient;
- Examine patient;
- Consult references;
- Consult specialists;
- Confirm patient condition and record.

Although these are all inherited sub-processes, not each specialization process performs each sub-process. For example, Pathologists do not question the patient, as their work involves the tissue and biopsy samples, not contact with the patient herself.

4.32 General Factors
This thesis dissects the breast cancer treatment process, but it is my opinion that many of the insights gained through the examination of a single malady are true for many other aspects of the health care system as large. Many of the insights and comments made
about the larger system were a secondary outcome of this project. The interviews were invaluable in providing us with not only a complete description of the breast cancer treatment process, but also the universe within which it operates. The primary goal of this project was to map the breast cancer treatment process. A secondary benefit has been an understanding of the current health care arena and some of the current pressing issues. Several of the subsequent sections of this paper do not address the breast cancer treatment process itself, but interested analysts should not ignore such tangential areas.

The Health Care Delivery System is a complex environment. We conducted the research for this thesis by following the process of breast cancer treatment through the medical system from the point of view of the patient, the major actor, the only player involved in every step of the process, from beginning to end. But a thorough analysis would not be conducted without examining the system from the point of view of the other actors, including primary care physicians, nurses, specialists, insurance companies, national cancer organizations, institutional administrators, governmental officials and attorneys. This list is incomplete, and while many members of the above list contributed to our research, investigating the system from the perspective of each of these players is beyond the scope of this project.

It became apparent that there is not one common set of goals operating beneath and motivating the health care system at large. Obviously, or so one would hope, patient health and successful treatment of the disease is number one priority, for both the patient and practitioners. The people with whom we spoke acknowledge the conflicts arise when the realities of the situation: limited resources exist for the health care system. Costs containment is critical. It is public knowledge that federal funds for health care provision are running out, and in the not too distant future many Americans currently dependent upon federal support will find themselves without financial coverage. The goals of the entire system are becoming efficiency, cost containment, and control, perhaps at the expense of the process of and quality of care. The providers with whom we spoke voiced this concern, while admitting there are no solutions, yet.

All of the people with whom we spoke acknowledge that the health care system is in a state of transition. New administrative structures are being attempted in an effort to improve the system. Providers are trying to focus on the task of care provision, but can not help but be influenced by the turbulent structures underlying the system. There is a recognition that the system needs to change, but there is resistance to accept every attempted new effort. There is concern that patient care will suffer, and that the medical profession will lose some of the artistry with which clinician practice today. Outcomes research is in its infancy, and it is difficult to make changes in a human services system, when there is no efficient way to determine the consequences.

4.33 Accepted Breast Cancer Treatment Practices

As mentioned above, the malady we selected has received a lot of media attention over the past couple of decades. I did not realize when we started the impact this would have on our research project. There was a vast amount of information available to us about the disease, treatment patterns, etc. It did not take long for us to determine who the major
players in the process were, and what the roles of each were. And we can be fairly confident that the processes we had described to us are not dissimilar from the medical treatment practices found in other health care institutions across the country. The dissemination of information into the community has established an informal set of practice standards, with which most providers and patients are familiar. For example, most women know that providers recommend a mammogram test on a regular basis, and that the current trend is toward reconstructive surgery rather than implants. Clinicians do not have the freedom to stray far from the accepted practices. Any deviations must be clinically justifiable. This is likely the case with all maladies. However, without there being a single official set of guidelines, there is an overall accepted treatment pattern.

Our process maps represent the typical treatment process at our specific sites. I feel fairly confident that due to these above mentioned nationally accepted practice and treatment patterns that most institutions across the country have similar practices. The process maps would be very much the same for the treatment provided at each of them. As a result, the specializations shown in our process maps are more activity specific (perform needle biopsy vs. perform surgical biopsy) rather than institution specific. There are most certainly differences that exist in how providers treat patients and how these patients move through even this accepted pattern of treatment. The process as described in this thesis is a fair representation of practices across the country.

As we began our research one goal was to identify any major bottlenecks or problems in the treatment process. We hoped to use the process handbook methodology to analyze the dependencies and determine “the” answer to all of the treatment woes, should there be any. What we found is a treatment process that works. The survival rate of breast cancer patients has only gotten better over the past several decades. Surgeries have gotten less complicated, the long term effects on the patient less physically traumatic. In some ways it is disappointing not to have uncovered “the” problem and “the” solution. Yet it is comforting to know the treatment practices that have evolved are successful, the best they can be. Of course research will provide more data and new treatments will evolve. But for now, the system works.

4.34 Dependency Analysis
We made the decision to focus our analysis on the treatment process as a whole, rather than choosing a single process and attempting to decompose it to the lowest level and perform our analysis there. For example, nowhere do we address issues such as where are surgical procedures performed? Who keeps the inventory of supplies up to date, and insures that the operating room is properly outfitted? Such minutia was outside the scope of this project, given time and resource constraints.

In order to perform the analysis, we constructed an activity list, as shown in Appendix A. Creating such a matrix allowed us to see where commonalties and overlaps existed between the processes and process requirements. The most obvious dependencies are primarily flow (must see a radiologist to get a mammogram, required before surgery), and resources constraints (time, money, provider availability). The process maps indicate
where dependencies exist throughout the process. For example, the first map shows the basic flow of a patient through the treatment process. There are multiple dependencies existing throughout the process. Flow constraints and clinical prerequisites dictate the main path a patient travels.

The key coordination issue in the breast cancer treatment process is what I will call hand-offs. There are so many players involved in the treatment process. Some of these people have the luxury of being in close contact with one another, and being able to discuss each case. Many however do not have regular opportunities to communicate. Each member of the process must understand his or her role and responsibilities. In the current health care system, a provider is responsible for his or her individual work. For example a surgeon is held responsible for what occurs in the course of surgery. But is not this provider a part of the entire treatment process? What became apparent through the course of our research is that it is becoming less and less clear who exactly is responsible for the outcome of treatment. The process maps do not indicate this dependency or linkage but it is there. Providers are very concerned about where their individual responsibilities begin and end. But isn’t the goal of the entire system to provide quality and successful medical treatment? The potential for conflict of interest is enormous.

Information must be made available to all of the parties involved in the treatment process. For example, the radiologist must be able to communicate to both the patient and the surgeon what the results of the positive mammogram indicate. This requires the creation of a medical record, access to it by the surgeon, and a common language that enables the surgeon to understand what has transpired. The patient "case" evolves in each phase of the process, and each successive provider must be able to begin where the process just ended. Time is critical, and the availability of such a compilation of information is a key success factor in treating breast cancer. Questions of what procedures were previously performed can be avoided, as can duplicate tests and procedures. Costs remain low and controlled, patients move smoothly through the system, and the end result has a better chance of being successful. This “handoff” dependency is a critical component of the health care delivery system. Information and responsibility change hands at every juncture. The management of these necessary coordination mechanisms is a major challenge facing the provider, and patient community.

The map which contains the decomposition and graphic analysis of "perform surgical diagnosis" is interesting. In order to determine whether or not a patient has a cancerous tumor, providers perform one of two tests, either a needle biopsy or a diagnostic lumpectomy. It is a choice that needs to be made, either one or the other. The map shows what we call a "dotted line dependency", specializations, indicating the requirement that a choice be made. It is not exactly a specialization, as they are mutually exclusive activities. Specializations are alternative ways of doing like activities. These are not like activities.
4.35 The Process Handbook

There are many mapping tools available on the market. Researchers can draw diagrams with even the simplest graphical packages. Based upon my own limited experience, the Process Handbook software tool and methodology offer the potential for a more in-depth analysis than other devices available. First of all it is very user friendly and easy to use. The ability to manipulate, copy and move sophisticated diagrams allows the user to concentrate on content rather than simple the visual images. The activity lists allow examination and understanding not only of what each individual component of the process is, but also how each relates to the others. And the potential for cross industry comparisons following the population of the database make the tool an attractive methodology for any interested organization.

The Process Handbook enabled us to break the entire breast cancer treatment process into its individual sub-processes. This is a critical first analysis step. But this is not where developers and investigators demonstrates the real value of the tool. It is in completing the activity matrices where analysts gain the real insights and understanding. Taking the time to think about who the actors for each step were, what inflows were required, what outflows were produced, and how each of these events took place led me to the comprehension of system operations, successes and potential trouble spots. The methodology is an orderly way to approach the examination of complex systems. Without such a tool, the deep connections between the providers would potentially not have been recognized as the critical component of the breast cancer treatment process that they are. It is the relationships between the actors that facilitate the treatment process. I was surprised by the extent to which these relationships can help or hinder treatment outcomes.
CHAPTER FIVE - INSIGHTS AND COORDINATION

Our analysis of the breast cancer treatment process provided us with many insights into related issues within the health care arena as a whole. Many of the issues and topics to be discussed in this chapter and those following relate to both breast cancer treatment and the whole system. They are obviously not mutually exclusive. Breast Cancer treatment occurs only within the larger universe.

5.1 Everything is unique

Our research was by no means exhaustive. We had access to a limited number of health care institutions and professionals. We mapped the patient treatment process from a bird's eye view. None the less, I believe the process we have been analyzing is representative of care and treatment provided to breast cancer patients across the country. The process described is by no means the right or the only way of providing breast cancer treatment to a patient. It is but one of the routes to recovery. Our research leads to the conclusion that:

- Each patient is unique;
- Each provider's practice is unique;
- Each treatment path is unique;
- Each set of standards are unique.

One of the ways businesses and industries seek to cut costs is through standardization. Standard operating procedures enable specific identification of dependency issues, of bottlenecks, and of inefficiencies. In a system where there does not appear to be any one single track to which a patient can be directed, how can standardization occur? The health care system today is attempting to standardize the care provided to all patients. Is this possible? There needs to be an understanding of the entire treatment process, as well as an in-depth knowledge of what the sub-activities are, and how they are related to one another before the existing system can be improved upon. The Process Handbook offers a tool through which analysts gain such understanding, and the hope is this thesis is the first step in enabling much needed insights. Generic processes can provide insights which investigators can apply to specific instances.

5.2 Current Coordination Mechanisms

There are limited resources available to the health care delivery system. Shortages of time, money, providers and facilities are ubiquitous and becoming more so. Each actor in the process flow is dependent upon the actions of proceeding actors. Patients are dependent upon the expertise and skills of the providers. There are many mechanisms already in place within the health care system addressing the management of these dependencies. Many patients have been successfully treated by the treatment process that exists today. The Process Handbook methodology makes possible the identification and acknowledgment of these mechanisms, though they may not be immediately identifiable.
in the actual process maps themselves. Many of the coordinating mechanisms need to be developed further, and made available throughout the medical community:

- **Patient and Provider Relationship:** "The referring provider, interpreting physician and woman should form a partnership to communicate and follow through with recommendations."\(^{25}\) Back to the concept of "my doctor", the relationships between patients and providers have been a critical factor in the health care system. The patient is the major actor in the treatment process, and being incorporated into the communication process is critical;

- **Medical Records:** A common language enables specialists from a variety of areas to understand the care provided to patients. Institutions and providers keep historical records, enabling the continuum of care over a lifetime. The movement of patients from provider to provider has increased in this country, and the medical records do not always keep up with the patient. For example, a patient frequently bring with her the written text of her last mammogram results, but not the actual image. The image is what is really desired in order to make a medical comparison with the current results;

- **Institutional Management:** Each institution operates independently. Complex inventories, staffing needs, etc. are taken care of by institutional administration. Administrators must manage providers and guidelines. Cost controls are being implemented by individual institutions and the system as a whole. The restrictions being imposed upon institutions by insurance companies are forcing internal cutbacks and examination of the treatment processes. The trend today is toward institutional mergers and acquisitions in an effort to consolidate facilities, skills and cost savings;

- **Practitioner Relationships:** Formal and informal professional networks exist among practitioners. Group practices, review boards, and professional organizations facilitate communications between providers. Individual providers are finding it more and more difficult to survive, some that we interviewed taking to advertising in order to draw patients. While limiting to some extent practitioner autonomy, group practices offer support from colleagues, and the ability to provide more contacts for patients;

- **Contracts:** Managed Care has brought an increase in the number of formal contracts existing between providers. Primary care institutions develop service relationships between specialists and outside facilities. The contracts have become much more detailed and complex, indicating and restricting exactly what services can be provided to patients;

- **Information Technology:** Computerized medical records enable the sharing of patient data between providers. Many issues exist regarding patient confidentiality, but

\(^{25}U.S.\ Department of Health and Human Services, Public Health Service, "Clinical Practice Guideline: Quality Determinants of Mammography", Number 13, AHCPR publication No. 95-0632, October 1994
allowing providers to access patient data can mean elimination of redundant tests, and
significant time savings. "To make managed care work will require strong
information systems, patient care management systems and technology management systems."26;

- Case Management: The health care profession recognizes the role of and the benefits
of a case manager as beneficial. Patient care is coordinated across an entire treatment
plan, the case managers aiding in making the process as seamless as possible, as the
patient moves from provider to provider, and stage to stage;

- Checks and balances: The medical community has historically monitored itself, kept
track of its own performance record. Exhibit 5 indicates some of the current efforts
being made to keep track of the system, to insure that proper medical care is being
given, and to coordinate the quality of care.

Beyond the clinical care itself, there is coordination at the administrative level. Some of
this activity is simple, such as a patient carrying a card in his or her possession indicating
the blood type, eliminating the need for a duplicate test should it be required. Insurance
companies know what has occurred to a patient, creating a depository of information for
historical records. But managed care has brought with it an entire network of
administrative related tasks. The approval and reimbursement processes alone could be
the basis for an entire research project. But even these efforts are not seen as "enough".
Costs continue to escalate. The number of indigent patients is on the rise, and health care
providers are finding themselves unable to remain in business, at least under previous
behavior patterns. "As the nation stumbles towards health care reform, there is a renewed
interest in the concept of an integrated or organized delivery system-- that is, a network of
organizations that provides or arranges to provide a coordinated continuum of services to
a defined population and is willing to be held clinically and fiscally accountable for the
outcomes and health status of the population service."27

If an outpatient facility does not have the resources to perform particular procedures, they
contract out these services, often to a participating hospital such as Emerson. The two
institutions negotiate a daily facilities fee annually. The outpatient centers also sign
contracts with all of the specialists with whom they work. Each provider signs his or her
own separate contract. Most HMOs have a recommended fee schedule for these
contracts, but each contract is indeed negotiated individually. If a particular provider
does not want to work within the financial boundaries proposed by the outpatient
institution, he or she sends the patients elsewhere. Unlike traditional hospital-outpatient
facility relationships, this provides the outpatient medical clinics with some leverage, and
some input as to the rates to be charged.

Health Services Administration, "Conceptualizing and measuring integration: findings from the Health Systems
Integration Study", Winter 1993. p 467

27 Ibid.
The inpatient institutions inform Primary Care Physicians whenever an admission occurs. An effort is being made to insure that a single provider is aware of everything that happens to a particular patient. The contracts signed between the HMOs and the outpatient medical facilities usually include a guarantee from the HMO that any and all paperwork and reports generated regarding patient treatment and care will provided to the PCP. Often, The outpatient clinic itself performs pre and post operative work. A smooth handling of information transfer (condition, medications, treatments, etc.) is crucial in order to provide a continuum of care.

5.3 Joint Efforts

Educational programs such as a recent "Breast Cancer Education for Primary Care Providers" are conducted. Many forums such as this are co-sponsored, as in this case, by the American Medical Women's Association, the Massachusetts Medical Society's Committee on Women in Organized Medicine, The American Cancer Society, and the Commonwealth of Massachusetts Department of Public Health. The national coordination of educational and treatment efforts is not new, but currently being examined with renewed interest. "Calling for a renewed war on cancer, an independent panel told congress that the National Cancer Programs suffers from inadequate coordination of public, private and voluntary components. The sub committee called for a presidentially led plan to coordinate all facets of the cancer efforts." The coordination of efforts often leads to improved efficiency and cost savings in any industry. The challenge is to reach the right balance of coordination, facilitation and independence. No single governing body dictates to the medical community how to provide breast cancer treatment, yet the practices are similar nationwide. Would there be benefit in having exact and specific standards established for every aspect of proving treatment? Clearly the overall system is simplified with common understanding and knowledge of the basic treatment process. But in my opinion there is no evidence indicating that the establishment of a single way of doing things would improve current outcomes, be they clinical or financial.

5.4 Current Efforts to Address Coordination Needs of the Future

"The concept of integrated or organized delivery systems as a means to offer more coordinated cost-effective care is growing. It is clear that integration needs to occur in order to provide a stable delivery process offering cost-effective, like services to all those in need. In order for this goal to be achieved in today's environment, once autonomous health care providers will need to start depending on one another, using the skills offered by other outside institutions. The era of a single practitioner providing all levels of care

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28 Informational Brochure, Massachusetts Medical Society, 1995
29 Blame, Elaine, "Experts Call for Full Coordination of Cancer Effort, Increased Access to Care", U.S. Department of Health can Human Services; Journal of the National Cancer Institute, November 2, 1994, page 1578-1580
and operating as an island is behind us. "Clinical integration entails the merger or consolidation of selected programs and services, the development of common treatment protocols for selected conditions, the development of patients management outcome systems, and the initiation of case-management programs...[and] should help a system avoid unnecessary duplication of programs, services and technology."31 The emphasis today is on cost cutting and efficiency. The above mentioned factors are all critical contributors to a modified system. Historically the health care system has been decentralized, and as is the case in many other industries, economies of scale and scope can be found in consolidating efforts and goals.

Coordination can not occur only at the clinical level or addressing institution specific procedures. Experts must revisit, decompose and recompose the entire health care delivery system. It is unfortunate that it would take an infinite amount of time to break the entire system down and use the Process Handbook as a means of analysis. I would speculate that specializations (different ways of executing the same task) would exist throughout the entire system, and using the database, best practices could be sought out and applied. Analysts should employ modeling packages. “Creating integrated organized delivery systems requires a new management culture that emphasizes managing across boundaries, which will require an emphasis on managing markets and networks of care across episodes of illness and, more important, pathways of wellness.”32

5.41 Information Technology

One of the huge advantageous seen by automated patient medical records is the implementation of complex and sophisticated tickler systems, ways to remind providers that mammograms are recommended, that a report has not been received from the radiologist, that a patient has not come in for follow up. It could be beneficial in flagging when something in the complicated chain of health care delivery does or does not happen. Such tickler systems are becoming more and more desired and developed, as physicians are being held responsible for what treatments patients receive. As indicated by one provider with whom we spoke, the primary care physician must now document that he or she recommended a mammogram (or other test), and the exact the outcome of the test or recommendation. If the patient herself chooses not to have the image taken, the provider must document that the recommendation was indeed made and not followed. As mentioned earlier, the lines of responsibility are somewhat blurry.

As health care institutions are becoming increasingly more integrated and reliant on each other, the need for sophisticated information systems is being recognized, and the advances in technological advancement are being taken advantage of. For example, a new institutional alliance being formed in the Boston area has recognized it can not succeed without an investment in information technology. "The new arrangement,

31 Ibid.

dubbed, Boston Healthnet, will initially make $6 millions available to the health centers for capital improvements. But, its organizers said, the network will require tens of millions of dollars for a computer network to make medical records and other information available throughout the hospital-health center network. The expensive computer linkup is vital to Healthnet's success, it won't work without it.”

5.42 Protocols, Guidelines and Outcomes

Guidelines, restrictions and protocols are being developed and enforced as a means of standardizing "the system". Protocol development currently emphasize what composes treatment practices. Attempts are being made to develop specific decision trees. “There is no attention to coordinating mechanisms in clinical protocol development” Even after experts develop such protocols or rule books, practitioners do not often follow them. Many providers do not even know that such guidelines or practice recommendations exist. "Guidelines are systematically developed statements to assist practitioner and patient decisions about appropriate health care...The guideline reflects the state of knowledge, current at the time of publication. Given the inevitable changes in the state of scientific information and technology, periodic review, updating and revisions will be done.” The purpose of designing guidelines is to improve quality of care for more patients. Guidelines are recommendations only, and providers widely recognize that there is no single right treatment path, and that they must treat each patient individually.

“In the report, the Congressional Office of Technology Assessment (OTA) also looks at the Federal investment in clinical practice guidelines that were intended to carry the most effective treatment message to practicing clinicians. Several agencies produce guidelines, but they are uncoordinated across agencies and sometimes even present conflicting recommendations. Some of the disappointment in the guideline development effort are attributable to the difficulty in creating an authoritative guideline when there is no good evidence and some to deficiencies in methods and implementation. The guideline process can be approved, says OTA, but it will require better coordination across agencies; better research to understand the implications of different methods for approving guidelines, and more systematic investment in implementing the guidelines that are produced.”

HMOs publish treatment guidelines, considered to be non_restrictive recommendations. While the intention is not to force changes in all clinical care, the result is exactly this. Providers do not want to have multiple treatment guidelines for patients dependent on the insurer. If an HMO delivers a new set of recommendations that the outpatient medical clinics choose to adopt for HMO patients, the practice will generally follow a domino

34 Consultant interview, February 2, 1995
36U.S. Department of Health and Human Service; Public Health Reports, "Efforts to Identify Health Technologies that Work Not Successful", January/February 1995
effect, and change the way in which all patients are treated, not just HMO patients. The result may be some patients who are in a position to consider multiple options (FFS) being under informed. The clinical understanding is that experts base such recommendations upon large outcome databases and analysis.

One issue of concern with protocols and guidelines is the potential for an increase in the legal suits by patients. If a clinician choose not to follow a set of guidelines and there is a problem, is he or she being medically negligent? At the same time, if an institution recommends a particular treatment protocol and a clinician adheres to these suggestions, and there is a problem, is the institutions liable? Is the provider liable for having followed institutional or national guidelines?

"Experience indicates that more than one methodology is often required to analyze data-primarily because some data are appropriately aggregated, while other data with different methods, designs or measurements of outcomes cannot be summed. Guidelines that address prevention, rehabilitation, screening or diagnosis and treatment conditions require a variety of methodologies because documentation of outcomes are based on different study designs." 37

5.43 Patient Education

There appears to be a general sentiment that until the public is re-educated, a revised health care system is doomed for failure. For example, historically patients expected to spend a great deal of time in the hospital, much of it being recuperative, but nonetheless, longer inpatient stays are still connected with quality of care. How can the level of care being provided be good enough if I am being sent home already? The result can be a population who do not understand or trust the system, and are thus hesitant to accept changes and reforms as they are being implemented, even contemplated.

Patient Education has taken on new meaning. Traditionally providers taught patients a minimum about illness and treatment. Experts taught only a few procedure and treatments to the patients for performance at home, for example insulin shots for diabetics. But today, patients are be allowed to, even asked to take an active role in their own treatment and long term health. "The National Cancer Institute encourages women to take an active part in early detection." 38 Women are being taught to perform regular self breast exams. No smoking and safe sex campaigns dominate television and magazine advertisements. Patients are being asked to take some responsibility for themselves. There is a recognition that non medical experts are capable of, and actually can play a crucial role in health care delivery.

For example, here is an excerpt from a recent patient education pamphlet: "You're in charge of your breast health:


38 National Institutes of Health, National Cancer Society, "What You Need To Know About Breast Cancer", page 4
• Schedule screening mammograms as often as your doctor recommends;
• Always find out the results of your mammogram;
• Follow your doctor's recommendations for follow-up and schedule diagnostic mammography, if needed, as soon as possible;
• Have your doctor check your breasts as part of your regular physical exam, and check your breasts each month;
• If you have a breast lump or change at any time, even if your last mammogram we normal, see a doctor as soon as possible.  

5.5 Barriers to Integration

Efforts to reform the health care system are not new. New laws passed throughout the past several decades address specific health care related concerns. The legal system in this country has essentially taken on medical concerns with vigor, fighting what seem to be system failures, not just from a clinical vantage point. A single solution can not be superimposed over the existing system, at least not in today's environment, Neither the public nor members of Congress will allow it.

Yet integrative efforts are beginning. Managed Care is considered to be the current solution, replacing Health Maintenance Organizations as the most popular buzzword. Some members of the health care arena are embracing such efforts. Many other medical professionals, along with patients, are resisting the proposed changes, although some of these changes are occurring around them.

"The major barriers to integration have been identified as:
• the failure to understand the new core business of health care;
• the inability to overcome the hospital paradigm;
• the inability to convince the 'cash-cow' to accept system strategy;
• the inability of board members to understand the new health care environment and their responsibilities;
• ambiguous roles and responsibilities throughout the system;
• the inability to execute the strategy;
• the lack of strategic alignment."


CHAPTER SIX- HEALTH CARE 1995: MANAGED CARE

"Federal research efforts to find current health technologies and practices that work better than others have provided few definitive answers so far, according to the congressional Office of Technology Assessment’s report."^41 The search is on. While clinicians embrace the current breast cancer treatment practices, accepted as successful, the overall health care system does not adequately meet the needs of the population, providing no services for some, inappropriate care for others. Managed care is being implemented across the country. In brief, traditional fee for service insurance plans are based upon providers receiving payment after they provide a service. Under managed care, patients are “members”. Primary care providers receive a monthly fee per patient, regardless of whether or not care is sought or provided. When a condition does present itself, it is up to the primary care physician then to provide and pay for any required treatment. There is thus incentive for the providers themselves to keep costs low. This chapter presents an aspect of health care illuminated by our study of the breast cancer treatment^4 process, and attempts to lay out some of the differences in the health care delivery system due to the advent of managed care, and some of the concerns that will need to be addressed in the future.

“Given that nearly all of health care in the future will involve managed care’, increasing the systems’ ability to provide such care is of critical importance.”^42 This section discusses the difference brought on by and concerns with the introduction of managed care. It became clear through the interview process that there is a major feeling of dissatisfaction with the way the system is being rolled out. While no one offered a better solution, I felt it necessary to acknowledge and consolidate the sentiments of the health care professionals. What is missing are the opinions of patients going through the system.

6.1 Differences in Business Processes Due to Managed Care

With Managed Care has come the era of negotiation. Outpatient facilities such as Acton Medical can negotiate contracts with specialists. They can arrange for various payment schedules and utilize bulk or global fee arrangements. Prior to such negotiating activity, such clinics had little to no input as to what charges the specialists and assisting institutions issued. Managed Care has brought with it an effort to streamline medical care delivery. The incentives to re-engineer processes are being added to the current system, and such streamlining is slowly being implemented. The theory is that health care costs in general are lower under managed care.

The outpatient facilities act now as gatekeepers. There is an eye towards medical necessity and cost control that did not previously exist. Care was much more fragmented,

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^41 U.S. Department of Health and Human Service; Public Health Reports, “Efforts to Identify Health Technologies that Work Not Successful", January/February 1995

different providers involved in episodic treatments components not communicating with each other, performing duplicate tests and services. The highest costs to outpatient clinics are referral costs, and the goal under managed care is to stop the illness before the patient get really sick.

With at least one of the outpatient organizations with whom we spoke, the managed care patients account for approximately half of the overall patient visits, while in numbers they represent only 15% of the patient population. Managed care emphasizes preventative medicine, and encourages providers to see patients for even slight problems or suspected issues. Employees are being asked to pay for more of their own insurance costs, and along with this has come an "entitlement" phenomena, a desire to "get my money's worth."

6.11 The Approval Process
The basis of the managed care system is approvals. Providers may not perform procedures (with the exception of those covered by basic insurance coverage contracts) without proper approval. There are strict guidelines that exist within each insurance organization as to what services they will and will not cover. No approval means that providers receive no reimbursement for services rendered. However, anything that is "medically justifiable" can be a legitimate exception to the HMO rules and regulations.

The outpatient clinics establish departments to handle the additional work required by managed care. At Acton Medical Associates, a staff of 5 belong to Member Services, whose sole responsibility is to answer questions for patients about claims, and work with the HMOs to receive approvals and determine alternative courses of action when rejections are received.

The providers with whom we spoke defend current medical practices and indicate that there are no differences in how providers treat patients based solely upon who the insurer is. This would imply that it is essentially clinical "business as usual". But at least one provider discussed how the practices within his clinic have changed across the board, for all patients, due to restrictions imposed by managed care providers. So while it may be true that care for an individual patient is not affected, accepted practice standards have and continue to change.

6.12 Trade offs
Using the Process Handbook methodology to complete process maps, activity lists and dependency analysis enabled us to gain a deep and detailed understanding of the components of the breast cancer treatment process. It is clearly not a simple mini system, with the typical patient seeing multiple providers in multiple institutions. Managed Care is attempting to address many of the coordination issues that arise, with concepts such as the continuum of care, guidelines and case management. There is potentially much to be gained from the implementation of such concepts, but as with everything, there are tradeoffs:
Physician Autonomy: Group practices can provide the individual provider with clinical backup, negotiating leverage, lower expense opportunities, among other things. But it can also mean forced compliance to a group set of standards or practices. Managed Care itself is restricting some of the practice patterns of providers. Cost control efforts reduce individual practice freedom;

Managed care may provide patients with a network of services, covering the entire continuum of care. But the patient can no longer choose which provider to see, it is not dictated by insurance restrictions;

The group practices being established assign each patient to a primary care physician. But once in "the network", the patient may see any of a wide variety of providers. The former doctor-patient relationship upon which the medical profession was once based is weakened;

Coordinating mechanisms designed to gather clinical opinions receive mixed reviews. On the one hand, the tumor review boards are a forum for soliciting multiple, expert opinions regarding patient treatment recommendations. But it takes time to pull together such a group, and costs money. Some HMOs are choosing not to pay for such reviews any longer, in the name of cost cutting. At least one provider interviewed felt this was a huge clinical mistake.

Any new efforts made to improve the health care system in this country will require tradeoffs, between actors, resource allocation, even values. The challenge is to insure that decision makers make the right trade offs. But who makes this determination?

6.2 Differences in Clinical Care Due to Managed Care

"Overall, research so far suggests that HMO quality of care is no worse than fee-for-service care, and is better in some cases. Last yea, a review of the research since 1980 concluded that compared with fee-for-service care, HMOs have lower hospital admission rates, use fewer expensive procedures and tests, use more preventative services and have comparable or somewhat better patient outcomes. They also found that patients are somewhat less satisfied with services but more satisfied with costs."43

Most of the providers with whom we spoke indicated that they are usually not even aware of what a patient's insurance situation as they are treating them, at least initially. For instance, as a radiologist is taking and reading a mammography, it is irrelevant for clinical purposes who the insurer is. It does become an issue at the point of determining the treatment plan. Clinically there are no differences. The variations in care come when deciding to whom to send the patient for the next step in the treatment process. This was not what we had expected to find. Given that the two organizational structures in place for the different basic types of insurance coverage and health care delivery, a marked difference in the clinical care provided was anticipated, if not in end results, at least in the means to a successful treatment end.

Certain HMOs have restrictions as to which hospital, outside institutions, and specialists may be utilized. FFS patients can generally choose to see whomever they would like to see, whereas HMO patients have to see someone that is in that particular network. For instance, Clinic-A has contracts with Hospital-1 and Hospital-2 to perform major surgical procedures. Many patients would prefer to have breast cancer surgery performed at Hospital-3, a nationally recognized breast cancer center. Due to HMO restrictions however, only FFS patients can make this choice.

Managed Care offers case management, and closer tracking of the entire episode, even continuum of care. Breast Cancer patient find themselves with an ally, familiar with the system, who is available for guidance through an unfamiliar system. One of the major advantages of such close clinical examination is a reduction in pharmaceutical problems. Over medication of patients, or drug-drug interactions are among the most frequent problems in traditional medical practices.

Some HMOs actually incent providers to perform mammograms. There is a list of preventative diagnostic screening tests which encourage the providers to perform or recommend for their patients. For instance, if Clinic-B performs mammograms on 90% of the patients eligible to have them (as determined by HMO-1 guidelines), "bonus money" is received. This encourages the practice and implementation of preventative measures.

6.21 Changing Roles

More and more responsibilities are being shared with nurses and physician assistants. For instance, for post-op visits, whereas the surgeon used to spend upwards of 45 minutes with a patient, addressing concerns in addition to examining the patient, a nurse now handles addressing the concerns aspects. The surgeon conducts the physical examination and leaves the room. The patients themselves are also being asked to play a more active role in their own care, effecting as well then the roles of former providers. "But in the lean and mean health care climate of the 1990s -- and possibly of the 21st century -- oncology nursing may become something completely different as patients go home sooner to recover there after zipping in and out of the hospital for surgery. Nurses may have to spend a large amount of time training patients’ relatives and community health workers to provide care for recovering cancer patients. And patients may get all but their surgical and post-surgical care at a nurse-run clinic with nary a doctor in sight." 44

6.22 Changing Facility Functions and Delineations

Many procedures once conducted in a hospital are now being performed in an outpatient setting. There is a financial incentive for the outpatient clinics to bring treatment on site: the basic facilities fee at Hospital-1 is $590 while at Outpatient Medical Clinic-A it is $150. Savings begin before the encounter has even begun. Outpatient facilities will perform many more procedures on site. Some members of the Health Care arena feel that

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only life threatening emergencies and planned complex surgeries will continue to require traditional inpatient facilitates, and stays.

6.23 Changing Mental Health Coverage

Under managed care, mental health coordinators meet with the patients, and assess the level and type of services required. Insurers approve a limited amount of treatment. Insurers view this limitation as more appropriate treatment for the malady than say a psychiatrists treatment, which tends towards long term care, and medication, which are perhaps not necessary. “General medical providers face many problems in understanding and treating some mental disorders, consequently leaving mental disorders in many people unrecognized or inadequately treated. Furthermore, the inextricable links between mental health, overall functioning (role in social, occupational and general health) and use of health care are becoming clearer -- that is poor mental health is connected to poor functioning and possibly inadequate or inappropriate health service utilization.”

But the system and patients require support services. Many of the HMOs have established support groups. But this is not enough. “Staff education is only one of the nursing care duties that is difficult to quantify. Nurses also have difficulty categorizing, for reimbursement purposes, the time spent with the relatives of a dying cancer patients. Psychosocial care can often be reimbursed if given by a psychiatric nurse practitioner, but that fails to address the psychosocial care given in the course of regular bedside care.”

Several of the providers with whom we met are concerned that a patients mental condition not be left out of any evaluative formulas being compiled by managed care. There is a recognized mind-body connection that must not be forgotten, as it can be critical to the overall treatment outcome.

6.3 Concerns with the System

6.31 Incentives

“Much of the concern has focused on incentives that many HMOs offer their physicians to keep costs down. Last month, the American Medical Association published a report outlining the ethical problems it sees with such incentives, and reminded doctors that it is their duty to be the patient’s advocate, regardless of an HMOs policies.” Are the incentives properly aligned with the goals of the overall health care system and the medical profession? For example, many of the outpatient facilities are now partnerships or group practices, with most of the practicing physicians being part owners of the overall practice. The institution as a whole needs to cut costs in order to compete in today’s dynamic arena. Yet at the same time, the individual providers have a medical


responsibility to treat patients and provide a high quality of care. Is medical care suffering as a result of this conflict of interest? The number of services and tests being administered is dwindling. The doctor-patient relationship, if existent, is changing, many providers spending as little actual time with patients as possible. "The inducements to withhold care are more troubling than incentives to overtreat.....Overtreating is obvious. Undertreating you never know about."48 There is admitted pressure by leading practitioners at HMO-1 to hold down costs, "that could theoretically lead an HMO to cross the line between reducing unnecessary procedures and denying needed care."49

As we began this research project, one objective was to closely examine the incentive system. We were unable to gain any specific reimbursement or salary information for specific providers. The providers we interviewed seemed reluctant to discuss the financial aspects of the breast cancer delivery process. Another topic for further research would be to scrutinize the system, determine exactly incentives are being offered to providers to change their medical practices and comply with the managed care restrictions. Are patients best interests still being kept in mind, or is the system leaning towards a financial emphasis?

6.32 Practitioners Involvement and Consensus

"It is time to pay due respect to the past--perhaps even grieve over it--but then to get on with inventing and managing the new delivery systems to meet the needs of the future."50 Many specialty groups and organizations are getting involved in the health care reform efforts. To date there is no common understanding of either the current system or agreement as to how to proceed in addressing the problems being encountered today. Since the beginning of the year alone, Congress held three hearings focused on screening mammography, particularly as it relates to health care reform. "In all three cases, members were most interested in the process followed by the National Cancer Institute in changing its statement on the benefits of screening mammography for women aged 40 to 49....Many members are frustrated that there is not a clear consensus on the efficacy of the procedure, especially within the scientific community."51

But discussions across the country are ongoing, and the results being brought to the public's attention. For example, the American College of Surgeons, an organization of 60,000 surgeons in both the United States and Canada, which is "recognized as the leadership organization for all of surgery, has in recent years assumed an expanded and

48 The Boston Globe, Monday, March 20, 1995, page 29, Dr. Joel Rubenstein, Newton-Wellesley Hospital
49 The Boston Globe, Monday March 20, 1995, page 29, Dr. Joe Dorsey, Harvard Community Health Plan
51 Tisevich, Dorothy A., "Congress Focuses on Mammography and Health Care Reform Legislation", U.S. Department Health and Human Services; Journal of the National Cancer Institute, July 20, 1994, pages 1050-1052
visible role by attempting to influence positively health care policy at the national level.”

“Simply stated, the American College of Surgeons supports the concept that patients should be able to receive appropriate care in a timely manner and foster the following principles:
- Protection of the patient’s right to choose his or her physician or surgeon;
- Assurance of direct patient access to physicians and specialists;
- Protection of the surgeon’s autonomy in medical decision making;
- Provision of a system that pays physicians for services provided to patients;
- Control of health care costs;
- The development of a simpler and more workable administrative system.”

In addition, the ACS “is opposed to systems that offer financial incentives to provide only a minimal level of care. In these systems, care that is needed for the health or comfort of the patient may be postponed or never provided. The College believes that appropriate initial care may avoid the false economy of minimal care followed inevitably by the treatment or operation that should have been rendered a priori.”

“Thus even with the prospect of universal payment for preventative, therapeutic and rehabilitation services, those who have worked for years to put together the fragile systems of care and those who have studied those systems and their failures have realistic concerns about proposed changes. They know all too well that plans which are primarily finance-driven will meet only part of the need of patients and of those who care of and about them...The adequate financing of an inadequate or misconceived delivery system will not guarantee better care...In fact, the transition, unless carefully planned, may worsen their plight, as established federal and state programs and funding streams are eliminated in the anticipation of new financing mechanisms; indeed, if cost-containment becomes the dominant force, new arrangements which arise may result in a reduction of necessary services.”

6.33 Imposed Restrictions
Some of the restrictions imposed by managed care are disrupting what some providers see as the positive aspects of health care delivery. For example, consider the case when a patient has a mammography that is read to be cancerous. In the ideal setting, the radiologist could sit with the patient, tell them what the next steps would be, set up an appointment for them with a surgeon or Oncologist in one setting. In the managed care system, a call must be placed to the PCP and home center, and most often, the patient

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53 Ibid.

54 Ibid.


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leaves the radiologists office not knowing what exactly the next step is, with whom or when. The patient is eventually informed who they will be seeing next, and must then make the appointment themselves. The radiologist usually has a better chance of getting the patient onto a surgeon's schedule than does the patient themselves. The result is often a waiting period. This disrupts the continuity of care, and can significantly add to the stress and hysteria level of patients.

The American Cancer Society recommends that women between the ages of 40 and 50 have a mammogram done every one to two years. Many primary care physicians recommend them annually, but the patients do not have them because insurance does not cover them. The providers must document that they recommended the procedure, regardless of whether or not the patient actually has the image taken. “Most expert mammographers in the United States believe that the screening interval for women aged 40-49 should be one year. The lead time for mammographic screening is approximately two years for women aged 40-49. Thus, a screening interval of two or more years should have a diminished impact on mortality reduction, since the number of poorer-prognosis cancers detected during the interval would increase, while the number of less advanced, screening detected cancers would decrease.”

Providers can not always keep the patients in the hospital as long as they would like. The emphasis is on getting patients out of the hospital as quickly as possible. Patients are being sent home or to sub-acute centers. At such centers, the continuity of care is lost. The surgeon who performed the procedure often has no idea who is then treating the patient, but yet is held responsible for the long term outcome. How does the surgeon (or other specialist) know that the people caring for the patient at the new site have adequate training or knowledge of the specific malady? If a patient spends two weeks in a sub-acute center rather than one week in the hospital, is there really cost savings?

6.34 Patient - Provider Relationship

There is no longer the concept of "my" doctor. Many patients assigned to a particular PCP have never actually had an appointment or even met that provider. There is often now no longer the concept of "my hospital". For example, one HMO whose patients had surgical procedures done at Emerson required that oncologists at Lahey Clinic be utilized rather than oncologists at Emerson Hospital itself due to contractual obligations. It makes coordination of care between providers more difficult. There is also not as much communication between specialists. Specialists working for the same hospital are more likely to discuss cases informally than when there are geographical and institutional boundaries between them.

The amount of time that providers spend with patients is decreasing. "There is only so much I can do for free." Capitation care provides for limited services, and the little

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extras, such as spending time with patients and their families are frequently now not reimbursable. A provider's time is often no longer covered. And it is getting more and more difficult for providers to ignore the financial implications of this arrangement. In addition, the relationships between practitioners and patients are dissolving.

"Managed care does not dictate medical treatment but rather financial compensation." This can be a problem, clinically and legally. If a provider sends a patient early due to insurer recommendation/restrictions, and something happens, the performing provider is still held accountable for the clinical outcome. "You did not HAVE to send the patient home." This has resulted in meticulous documentation being kept, explaining why something is or is not done in a particular manner. This trend alters the doctor-patient relationship. Patients are blaming providers for occurrence due to insurer restrictions. Providers more and more frequently find themselves having to defend their actions.

6.35 Additional Administrative Work

Managed care has brought with it significantly more paperwork, more phone calls, more negotiations and more arguing. Insurers require prior approval for almost everything. Receptionists frequently leave specialists and their staff on hold for long periods of time while waiting for approval. Insurer representatives frequently give out wrong information. One specialist with whom we spoke indicated she has contracts with over 65 different insurers, each with its own set of requirements. Tracking of and insurance to requirements often requires its own staff position.

6.36 Shifting Roles and Responsibilities

Many procedures are being conducted in outpatient facilities rather than in traditional hospitals. There is some concern among providers that the personnel at such settings are not adequately trained, and do not have the experience or resources available to them to handle problems should they arise.

In recent litigation, PCPs are being held accountable for cancers not detected early enough, considered to be negligence. Is it negligence on the part of the PCP if the patient chooses not to have the image taken? Is the insurance company in any responsible? These issues also arise when younger patients are being examined. Managed care plans frequently do not pay for mammograms for younger women. Any woman whose mother had breast cancer is considered to be high risk, and the sentiment among many providers is that these patients should qualify for coverage of mammograms much earlier than typical patients.

There is not always a clear delineation of responsibilities. For instance, who is responsible as the patient changes hands from provider to specialist of informing them of all of the available options and outcomes? Who is responsible for the eventual long term outcome of the entire treatment plan, the PCP? The surgeon? The managing facility? With HMO patients, it is expected that the PCP will play an ongoing active role in the treatment of the patient. The answer is not so clear for FFS patients. For example, the PCP provides most post-op care for HMO patients, whereas for FFS patients it is often
sought outside, with most of the responsibility falling on the surgeon. The HMO arrangement facilitates a long term continuum of care as well as potentially smoother episodic care.

In addition, there is concern among providers regarding accepting responsibility for patient behavior. For example, at Outpatient Medical Clinic-A, a follow up system is being implemented. If a radiologist detects a lump in a patient's mammogram, the PCP and the nurses contact the patient throughout the process to insure that the appropriate next steps are being taken. If a patient decided simply not to go see a surgeon, the PCP is now being held indirectly responsible for these actions, in the form of responsibility for long term health of the patient.

6.37 Medical Treatment

Critical pathways are currently popular in the medical profession. Many companies are selling critical pathways to health care institutions. They base the recommendations on huge databases, and outcome analysis. Some providers feel they are losing say about how to treat patients. Many diagnoses have one treatment planned mapped out for them. At a minimum, there should be three different care plans for acute, sub-acute and home services care.

There is a concern that many of the decisions made by insurance companies as to whether or not to cover a treatment are based on "computerized checklists". Approval is granted (or not) by non-clinical analysts looking at a list that says if X, then Y. Several providers mentioned to us this causing they themselves to make calls to argue a patients case.

Another example of some of the current issues (NOT a real patient case.): A 46 year old woman has breast cancer. A provider found the lump during a routine mammogram, she had a lumpectomy, and was recommended for post-op radiation. The question: Her nodes are negative. Should chemotherapy be entertained as a treatment solution? The oncologist or surgeon presented the case at the tumor board, where the consulting oncologist recommends the patient receive chemotherapy. It is recognized that the patient is at high risk, and 5% of such patients will benefit from the additional chemotherapy. The patient is referred to an oncologist at Emerson to receive the chemotherapy. This should be a joint decision, with the patient involved. There is only a 5% chance that patient will receive additional benefit from this treatment. Moral: The patient is at the margin. The patient "might" see a difference. Obviously there is a cost difference. The clear benefit is at the medical margin. "The incentives under managed care are to minimize, and this carries over to FFS as well, with a current prejudice against marginal medical procedures."57

6.38 Research

There are also concerns about medical research, specifically its future. "We are now read to build on the first 20 years of the National Cancer Program. The identification of

57 Primary Care Physician, March 9, 1995
BRCA1, the breast cancer susceptibility gene, resulted from basic research, but transitional research is needed to determine how to use the knowledge...It will be necessary to identify new sources of financial support for basic translational research. 'In my institution, some research funding was coming from patient care revenues, and that is now drying up because of managed care, and increasing numbers of indigent patients'.

"Cancer Centers, specialists, and clinical trials need to be available to all cancer patients. A Renewed Commitment Calling Cancer a formidable problem, urged a new a renewed commitment to 'the three foundation stones-- basic research, clinical trials and cancer centers.' said National Cancer Institute director Samuel Broder, M.D. He added that he did not believe there were any shortcuts."

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58 Blume, Elaine, “Experts Call for Full Coordination of Cancer Effort, Increased Access to Care”, U.S. Department of Health and Human Services; Journal of the National Cancer Institute, November 2, 1994, page 1578-1580, Interview with Margaret Kripke, Ph. D. from University of Texas

59 Ibid.
CHAPTER SEVEN - THE FUTURE

The breast cancer treatment programs in place evolve on a regular basis. Experts continuously perform clinical research and study outcomes. Small changes in practice recommendations are made often and incorporated into national treatment plans. Continuous evolution of the breast cancer treatment process is now expected. The same is not true of the environment in which this treatment occurs. The health care industry today is “a very fertile ground waiting to be mined”\(^6\) Changes are occurring on a daily basis to “the system” as it has traditionally been practiced in the United States. “As competition grows among HMOs and the young healthy people who were typical early enrollees get older, the pressures to restrict care will become even greater.”\(^6\)

7.1 Unified Strategy

One concern is how to keep individuals and institutions in line with the bigger picture, the health care system as a whole. The emphasis in the past has been on individual survival, not the success of the system. A single long term, national strategy needs to be developed, and implemented. It will not happen overnight. There will be many obstacles to overcome. But in order for the failings of our current system to be corrected, the entire system must cooperate. “Most strategic failures involving health care organizations are due to the inability to execute or implement strategy and not to adoption of an incorrect strategy. The challenges are grouped into four categories: lack of understanding of the strategy, lack of agreement with it, insufficient skills to execute the strategy, and the lack of sufficient rewards and incentives to implement the system.”\(^6\)

The relationships being created between outpatient facilities such as the institutions with whom we worked for the purposes of this project and inpatient facilities are just one type of alliance forming throughout the industry. Hospitals themselves are forming alliances with each other. For example, “A group of 13 New England Regional Hospitals is self-organizing into an alliance to provide managed care.”\(^6\) Health care will no longer be provided in the fields it once was, institutions cooperating with each other where they were once competitors. Among the pertinent issues leading towards these relationships:

• Geographic coverage and access to more covered lives;
• Ability to provide a full range of provider services;
• Ability to assess and manage risk;
• Access to capital;
• Economies of scale/ cost control;
• The ability to develop process oriented operating protocols.\(^6\)

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\(^6\) Primary Care Physician interview, March 11, 1995

\(^6\) The Boston Globe, Monday March 20, 1995, page 29


\(^6\) Fred Luca, January 1995

\(^6\) Ibid.
The need to manage limited resources and to institute programs of quality assurance requires an increase in the coordination between physicians, other health care providers and hospitals. Health care is becoming decentralized. What was once a system of independent, hierarchical, single institution providers is quickly becoming represented by distributed organizations, where services and information are made available to and from all participating.

7.2 Need to Change the System

Most people we interviewed agreed that the current system needs to change. There are admitted redundant tests performed and more economical and efficient ways of performing some of the services currently being provided. “There are legitimate abuses of the system. There are real ways to cut costs.” But to change the current system without a new, back up system in place hurts not only the patients but the providers as well. “The first challenge was in recognizing that certain building blocks must be in place for managed care to operate effectively. Among the more important of these are having:

- sufficient numbers of physician leaders who understand the new realities of health care;
- a sufficient number of physicians organized into group practices;
- a sufficient number of primary care physicians in order to play needed gatekeeper and case manager roles;
- information systems in place that can provide clinical and financial data that both improve internal processes of care and provide external information for purchasers’ decision making.”

In the past, many patients came in to see a doctor for more mental than medical treatments, perhaps just for reassurance, or even simple company and human contact for those patients living alone. With the onset of procedures like the triage nurses, these visits often no longer occur. Yes, there is short term cost savings. But how are the needs of these patients being addressed? Is there a back up system in place? What are the long term repercussions, the existence of a mind-body connection having been recognized in the United States medical system?

7.3 Shortage of Primary Care Physicians

Most health services executives with which we spoke clearly understood this shift [of the center of gravity around which it focuses its energies] but had not yet been able to engage their organization either emotionally or behaviorally to place primary care at the center of the system’s efforts.”

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65 Ibid.
66 Surgeon interview, April 3, 1995
68 Ibid.
As the managed care system continues to evolve, it is becoming more and more apparent there is a shortage of primary care physicians in the health care system. Over the past several decades the emphasis, or at least the trend, has been towards medical students going into specialized medicine. Niche practices are ubiquitous throughout the health care system, for example, sports medicine practices, rheumatology clinics, etc. But the managed care model is based upon the primary care physician being the central figure in a patients care, across the entire continuum of care. The emphasis is being placed on a single provider being aware of and even being an active participant in all aspects of a patients care, no matter what the malady.

"Medical staffs are becoming more heterogeneous in terms of background, specialty training and experience."69 This applies to all members of the health care profession. The roles and responsibilities of many of the actors are being redefined. Nurses now perform tasks traditionally performed only by doctors. Nursing tasks are now being performed by physician and medical assistants and nurses aids. There are some concerns about whether or not these personnel are truly adequately trained to perform all of the duties now being required of them. Perhaps the medical education system needs to change its curriculum and premises to address the evolving skill requirements.

"Retraining for the new core business of primary care must include all health professionals. this is a major challenge given the shortage of primary care physicians. New models of primary care delivery must be explored that include formal retraining programs for specialists to become primary care physicians."70

New roles will also need to be determined, somehow taking the expertise gathered over years of existing practice and applying them to the roles that will be required to meet future health care needs. "As part of oncology nurse redefinition, the two major groups of advanced specialty nurses who serve oncology patient -- clinical nurse specialists and nurse practitioners -- must ponder whether they will converge or diverge roles. Clinical nurse specialists, who work as consultants to staff nurses and as educators of patients and their relatives, are prepared to work in acute care settings. Nurse practitioners, who diagnose some patient problems and sometimes prescribe drugs, work both in outpatients primary care and in hospital clinics. However, the paradigm under which these specialties evolved has shifted. These two types of oncology nurses may have to educate, prescribe, consult and diagnose, possibly as a new hybrid: the advanced practical nurse. At the same time, doctors may increasingly limit their roles to the more technological aspects of oncology, moving even further from bedside care."71

69 Fred Luconi, January 1995


7.4 Telemedicine

"Telemedicine, broadly defined as the use of telecommunications for medical diagnosis and patient care, has the potential to provide health care to millions of people living in rural and isolated areas."\textsuperscript{72} Several of the specialists with whom we spoke indicated that technologies and developments such as telemedicine were being seen as one of the answers to some of the resource constraints and dependency issues. It is a technological answer to some of the medical coordination issues. "Broadly implemented, telemedicine would reduce annual health-care costs by at least $36 billion, or 3\% of this year's estimated health bill." \textsuperscript{73}

Not all health care providers are embracing the new technologies. Providers are accustomed to practices direct patient contact medical treatment: feeling the pulse, touching, listening. "Doctors, by nature a conservative bunch, are uncomfortable not only with the examination process, but with the new technology. Some think it isn't quite ready...noting the potential for misdiagnosis if the video transmission in not up to snuff. Some doctors fear telemedicine could make specialists obsolete."\textsuperscript{74} There is also fear of using an automated system which can document and store every clinical decision and treatment. Others still doubt that patients themselves will accept the new methodology as a replacement to the personal contact medical care to which they are accustomed. In addition," there are other significant obstacles to the widespread acceptance of telemedicine which include:

- Lack of data. There were fewer than 1,000 genuine teleconsultations performed in North America last year, and there is little empirical evidence that telemedicine improves the quality of patient care;
- The cost-effectiveness of telemedicine has yet to be established. The current cost of equipping and running a single telemedicine center is $100,000 per year. Without sufficient patient volume, most of America's 2,500 rural hospitals could not afford that hefty capital investment;
- Performing medicine across state and national boundaries raises certain licensing and reimbursement issues. Will all parties on a teleconsultation get paid? In a teleconsultation between two physicians in two states, which state regulator will have authority? \textsuperscript{75}

7.5 Virtual Medicine

What would it mean to practice “virtual medicine”? The word virtual is often meant to indicate a process or activity that happens without any human contact, without in some cases even really “happening”. People will always need to have some sort of health care provided for them, not many of us are fortunate to be healthy and accident free all of our lives. Efforts are under way to limit the amount of time patients spend with providers,\textsuperscript{72} Nay, Kate, U.S. Department of Health and Human Services; Journal of the American\textsuperscript{73} Business Week, October 3, 1994, Pg. 117\textsuperscript{74} Investors Business Daily, August 17, 1994, Pg. A4\textsuperscript{75} Ibid.
whose time is rightfully thought to be a valuable resource. Computer systems are being put in place which allow patients to essentially diagnose themselves, in some cases walking through decisions trees themselves to determine the next treatment step, and if intervention is necessary. but many patients are not ready for such responsibility, or do not want it. Many patients still want simply to be told what to do, and do not want to be an active part of their own care. The movement to empower and involve the patient will work for some portion of the population, but not all. There is also the issue of simple human contact, which we all need. The mind-body connection is a strong one, and for many a simple visit with a provider, be it in person or on the phone, can offer the reassurance and mental comfort needed for full recovery. As the health care system is revamped, the designers need to keep this fact in mind. But how does it fit into any cost consideration questions?

7.6 Visa International and the Internet

There were other research projects being conducted through the Center for Coordination Science while this thesis was being completed. Through discussions with fellow students, ideas were exchanged regarding similarities and differences between our processes and the others being researched. There are many issues that arise in multiple processes, in multiple industries. The Process Handbook methodology allowed us to gain the understanding necessary to exchange insights.

Visa International and the Internet Society were studied from an organizational standpoint, and there are more similarities in the governance, and possible future governance structures and strategies than I would have thought. Both organizations represent decentralized government structures. The actors at the "bottom layer" of the Internet structure are individual computer users, people who access the services offered through the net. Some of these users organize into small "communities", people with similar interests, and ideas about how to expand the capabilities of the internet. In order to gain access to internet and take advantage of the services available, users must comply to the established standards. Visa consists of many smaller banking institutions each serving its own customers. Each institution manages itself, and its credit card relationships, acting within the guidelines of Visa International. The Health Care system is composed of many small institutions serving individual patients. Many of theses institutions work together, and try to enhance the services they are able to provide to the surrounding population. The American Medical Association, among other guiding bodies, provides health care guidelines under which these individually managed institutions must operate.

All three of these organizations have scant if any true governing bodies. There are guidelines, even some specific standards and regulations. But much of the governance role is left to the individual institutions that participate in the relevant "network". It is a decentralized structure, with the "lower level" participants in control of local structures.

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76Emily Breuner and Tor Ramsay contributed much of the information on Visa International and the Internet.
and procedures. The bottom layer of the hierarchy often generate new ideas. A new approach or standard is trialed in a single institution. If successful, the knowledge is passed up the "ladder", being shared with other local colleagues or partners. Eventually the activity or idea rises to the top ranking parties, who will decide whether or not to institute the new standard across the board. If so, the principle is sent back "down" the hierarchical ladder and shared with other "lower level" participants. Some of these standards are actual enforced regulations, while others are suggested guidelines.

The medical community certainly follows this structure. Each practitioner practices medicine in a different way. There are of course standards of care, but as each case is unique, so each treatment plan and carry through. One provider determines a new way of performing a service, shares it with colleagues, who share it at national conferences, where it might eventually make its way up to the level of national debate, such as is occurring now with the debate on the frequency of recommended mammograms. One of the challenges in health care, as well as in both Internet and Visa, is how to encourage innovation by the participants of the system, while at the same time having some sort of control over the types of activities that occur. What kind of a health care system would it be if every primary care provider had his or her own separate way of practicing medicine? Or if every bank had an entirely different way of issuing and handling credit cards? But at the same time, would the quality of care ever improve if innovation by the people practicing medicine did not occur? Some coordination mechanisms are already in place which enable this to happen, and for such new ideas to bubble their way to a level of national attention (professional organizations, journals, etc.)

The issue in my mind is how then to take such a sea of individuals, and try to make them all swim in the same direction. If overriding changes need to occur from the top down in order to improve the entire system, such as is the national opinion right now with health care, how can this be done? Or can it? The Internet Society loosely controls the users of the internet. Visa International dictates some of the practices of its member banks. Some specific professional associations, such as the American Cancer Society, provide practice guidelines for medical treatment providers. The United States government is the only overriding force with the ability to change the system as we know it today. But even it is having troubles knowing where to start in restructuring the current chaos.
CHAPTER EIGHT - CONCLUSIONS

"System leaders must become more active sponsors of change in both emphasizing the centrality of primary care and population-based wellness models and "increasing the pain" of remaining with the status quo." And the development of the Process Handbook is one small way of beginning to provide the tools to enable leaders to gain the depth of understanding needed to breakdown and reconstruct the health care delivery system as it exists today.

I am one of the fortunate Americans who has to date not had to deal with either a lack of medical coverage or poor treatment. Unfortunately, this can not be said for many, many Americans. With rising costs, Health Care Providers and Institutions have been forced to cut costs, and as a consequence thereof, cut services offered. Many problems with the traditional medical system are being corrected, such as the elimination of redundant tests, and lengths of stay in hospitals more appropriate to a patient's needs. But there are many issues to be resolved.

Breast Cancer as a disease is well publicized all over this country. Women of all ages know the preventative measures that can be taken, the current treatments being practiced, and the improving recuperative and recovery rates. Our research showed little variation in the care given to a patient based on her insurance coverage, the most significant difference being the freedom to select a particular provider. This was encouraging to encounter. This conclusion is based upon our interviews. Is this the reality of the situation? I had anticipated finding a significant difference in the care provided to patients covered by differing insurance plans. Providers tell us this is not the case. Perhaps it is true that the actual procedures themselves are not any different. If this is the case, why then are the changes brought on by managed care getting so much publicity and claiming that they will improve the health care delivery system?

In reality, the jury is still out. Outcomes research is in its infancy. Information technology is enabling the creation of huge databases and tracking networks, which will be able to provide feedback on changes to the system, to the quality of patient care, and to attempts to standardize processes such as the one mapped in this thesis. One major hurdle in evaluating the success of any health care plan is in the choice of metrics. What is considered to be a "good" health care system, or a successful provision of breast cancer treatment? Is the goal to save costs? Save lives? Improve efficiency? Until experts can reach an agreement as to what the goals of the system are and how to achieve these goals, many attempts will be made to improve upon the existing system, but it is my belief none will be universally accepted.


53
What we did uncover was a great deal of fear and frustration with the health care system today. Providers and administrators agree changes need to be made. But the transition stages are painful. The consensus seems to be for the need to adopt a unified strategy, perhaps implementable in stages, about which the public and practitioners could be educated. Care givers and receivers alike need to understand the system, the factors that make it ebb and flow.

By mapping the breast cancer treatment process, we hope to have taken the first step toward understanding the health care delivery system as a whole. The dependencies are complex the linkages between activities many. Some of the generic processes we identified can perhaps be applied in other aspects of care giving. This could be particularly valuable and true, as the treatment cycle as we discovered them do indeed seem to be providing high quality of care to patients, survival rates unchanged due to organizational implementations.

"We have grown accustomed to changing only in reaction to outside forces, yet the wellspring of real learning is aspiration, imagination, and experimentation."\textsuperscript{78} The challenge facing the health care community is how to move forward to face the forces of the present and the future. Innovation must be encouraged, but somehow these efforts must be coordinated if there are to be any major changes made to the system. Ideas are being generated at a grass roots level, with individual providers finding ways to cut costs and change practices to accommodate the needs of the public.

There may never be a single methodology for providing breast cancer treatment. The Process Handbook enabled us to understand the differences in the care patterns and the resources required to provide care. Many actors are involved, as are multiple institutions in the treatment process. From the collaborative efforts of the Primary Care Physician and the specialists (who must determine treatment plans) to the relationships between various professional organizations attempting to provide standard treatment guidelines, coordination of efforts, style and values are required. The Process Handbook allows a visual understanding of the individual activities involved in the breast cancer treatment process, and permits access to a powerful tool for understanding the relationships between activities that exist. Only when such visions have been obtained can real change be implemented.

This thesis is in no way meant to pass judgment on the system as it exists today. The care being provided by the institutions with whom we worked is commendable. The hope is to simplify, and thus understand, the individual activities required in the assault on breast cancer, to determine if and how they relate, and to gain insights into how the current system survives and could evolve to better meet the needs of both the patient and health care communities.

\textsuperscript{78}Senge, Peter M., Kofman, F., "Communities of Commitment: The Heart of Learning Organizations", 1993, 03.020
EXHIBIT 1: MEDICAL FACILITIES STUDIED DURING RESEARCH

Acton Medical Center
"We are a group practice of Internists and Pediatricians, who have united to provide high-quality primary care for patients of all ages." 79

Acton Medical Associates (AMA) is located on Main Street in Acton, Massachusetts. There is a single satellite office in Littleton, Massachusetts. Patients identify with a single primary care physician, though any internist may be seen during the course of treatment. All Acton Medical physicians are members of the active staff at Emerson Hospital. Routine services and appointments are available Monday through Friday, with urgent care only provided weekends and holidays. 24 hour medical coverage is insured, with an internist being on call at all times.

"Each patient should choose one of us as their primary pediatrician. All routine and non-acute visits will be scheduled with that doctor. Each of us has openings in our daily schedules for emergencies, but if your primary pediatrician is not in the office, or his/her schedule is already full, the office will arrange for you to see one of the other pediatricians. It is our philosophy that if your child is sick and needs to be seen, he will be given an appointment that day." 80

AMA has 17 doctors on staff, 14 of whom are stockholders. The other 3 are salaried with 12-18 month contracts. 70,000 patients were seen last year, 15,000 of them Harvard Community Health Plan members who accounted for 50% of patient visits.

Concord Hillside Medical Associates
There are three sites from which services are provided: Concord, Bedford, and Sudbury, Massachusetts. Pediatric services are available in Harvard, Massachusetts as well. Concord Hillside has 20 providers on staff. 11 of these are partners in the organizations, while the other 9 are salaried associates. There are internists and pediatricians, and specialists in areas such as obstetrics, optometry, allergy and pulmonology. Routine laboratory tests and X-rays can be taken care of on site. Care is available 24 hours a day.

All patients are assigned to a primary care physician. "Your primary care physician will be the one to always see you, help you make health care decisions and refer you to specialists when necessary." 81 Concord Hillside has an exclusive relationship with Harvard Community Health Plan, whose patients account for 50% of the total annual visits.

79 Acton Medical Associates, Informational Brochure, Internists, 6-94
80 Acton Medical Associates, Informational Brochure, Pediatricians, 6-94
81 Concord Hillside Medical Associates, Informational Brochure
The informational brochure describes the basic requirements: "HCHP requires that all your medical care (including on-going, urgent and specialty care) be approved by your primary care physician."\(^8\)

**Emerson Hospital Overview**

Emerson Hospital is a nonprofit, acute care community hospital located in Concord, Massachusetts with over 200 beds. The Hospital is the dominant health facility serving the communities of Acton, Bedford, Concord, Lexington, and Maynard. The Hospital provides a broad array of both inpatient and outpatient services to the community. Its services include pediatrics, obstetrics/gynecology, psychiatric care, diagnostic procedures, outpatient surgery, cardiac medicine, cancer care, and emergency/trauma treatment. The Hospital also provides home health care and numerous health care education programs and support groups. Additionally, the Hospital provides training for practitioners in cooperation with seventeen colleges and schools\(^9\).

\(^8\)Ibid.

\(^9\) Official Statement, 1 December 1989, Massachusetts Health and Education Facilities Authority.
EXHIBIT 2: CONTRIBUTIONS TO THE HANDBOOK PROJECT

Author: Marty Geisler/M.I.T. Center for Coordination Science
Composed: 04/14 09:21 AM

Subject: Avi and John: PH unplugged
Category:

Hi Avi and John. I finally ran across the list of questions/features Wilder and I came across in our Process Handbook inputting last weekend. It is a great package, just a few things that we stumbled upon:
(F = feature that would be nice, B = bug)

F: There is no way to "save as". I had a file on a diskette, and wanted to save on the hard drive. I was able to, from DOS, but couldn't through PH.
B: Couldn't see all of the generic processes. "all 100 lines in use".
B: Arrow keys seem to get confused. The up arrow and the left arrow seem to always do the same thing, as do down/right. But sometimes left is right, up is down. Appears to be random confusion.
B: If you accidentally hit "another" under the decomposition activities screen with nothing written in the fields, you are bombed out.
B: Likewise, if you enter several activities, then when you are done, hit the "save" button, you are knocked out. Again, I think this is because nothing was written in the fields.
B: If you erase or add a specialization, the redraw on the screen is not always legible, specializations being placed almost on top of each other, impossible to reach with the mouse.
F: It would be great to have a move button, and a way to highlight just what you want to have moved. (Parts of a decomposition for example.) (There is one perhaps?)
F: There is no way to "search" through the trees. It is difficult to find a certain activity. It would be great to be able to search, and have the program take you right to where you want to be, rather than having to wade through all the tree levels in search of...
B: Frequently when we were down several levels in a decomposition, and went into a lower level attributes or environment screen, when we were done, rather than take us to the decomposition/activity from which we had double clicked to get to the info screens, we would be brought back to the very top level of the tree, sometimes 4 or 5 layers back.
B: When we tried to create dependencies, then back out of it (erase) or go up a layer, we were bombed out. This occurred all day last Sunday, but I was not able to recreate when I tried to show John this week. (???)
F: It would be nice to be able to add a level to the tree, in the middle of an existing one.

I think that is it for now. Thanks.
EXHIBIT 3: PROCESS OF DETECTING AND TREATING BREAST CANCER

The following is a brief description of the detection and treatment of breast cancer. The process maps provide more specific detail. This is meant to provide the reader with a short synopsis of the malady we chose to investigate. Many of the following steps and statements are generalizations, made in order to simplify the description. The treatment of each patient is unique and may not follow exactly the following patterns. This description is based upon the interviews conducted during the course of our research for this project.

<table>
<thead>
<tr>
<th>Age Group</th>
<th>Probability</th>
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<tbody>
<tr>
<td>Birth to 39</td>
<td>.45 (1 in 222)</td>
</tr>
<tr>
<td>40 to 59</td>
<td>3.78 (1 in 26)</td>
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<tr>
<td>60 to 79</td>
<td>6.78 (1 in 15)</td>
</tr>
<tr>
<td>Ever (Birth to Death)</td>
<td>12.2 (1 in 8)</td>
</tr>
</tbody>
</table>

Percentage of Female population (probability) Developing Invasive Breast Cancers at Certain Ages

Most women will be affected by breast cancer. As indicated in the above chart, one in 8 will at some point in her life receive invasive treatment for breast cancer. There are no true preventative measures for breast cancer. Early detection is the only way to increase long term survival rates. "When cancer is found and treated early, a woman has more treatment choices, and a good chance of complete recovery. So it is important to detect breast cancer as early as possible."85

The patient is seen by the Primary Care Physician (PCP) either for routine care, or due to a suspected lump the patient found herself. Patients with suspected lumps are seen as soon as possible after detection. If deemed necessary, a mammography is ordered. "Mammography is the primary tool for the early detection of breast cancer. An estimated 23.5 million mammograms were performed in 1992 at a cost of about $2.5 billion. Mammography is the only detection technique shown to reduce breast cancer mortality, particularly in older women."86

"Mammography involves two x-rays of each breast, one taken from the side and one from the top...In many cases mammograms can show breast tumors before they cause symptoms or can be felt. A mammogram can also show small deposits of calcium in the breast...[which] may be an early sign of cancer."87 Some outpatient facilities such as

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84 American Cancer Society, "Cancer Facts & Figures 1994", 94-375M-No. 5008.94
85 National Institutes of Health, National Cancer Institute, "What You Need To Know About Breast Cancer", page 4
86 U.S. Department of Health and Human Services, Public Health Service, "Clinical Practice Guideline, Quality Determinants of Mammography."
87 National Institutes of Health, National Cancer Institute, "What You Need To Know About Breast Cancer", page 4
Concord Hillside have mammography facilities on site. Other, such as Acton Medical Center do not, and refer patients to outside facilities, usually and preferably Emerson Hospital.

The mammography is read by a Radiologist. At some locations, such as Emerson, the reading radiologist is on site, and reads the image immediately after being taken, with the patient still in the office. Other locations do not have the radiologist on site, and the patient has to wait two to three days to get the reading results, as the image is sent to the appropriate expert to be read.

A surgeon gets involved when a lump is discovered or a patient needs a biopsy. After examining the patient, and confirming that surgery is necessary, the procedure is scheduled. At Emerson Hospital, the goal is to make this appointment for within 2 weeks of diagnosis and confirmation. Either a needle or a surgical biopsy is performed in order to obtain a tissue sample. A pathologist reads the tissue sample, determine whether the sample is benign or malignant, if cancerous, what type, and how far the disease has spread. Depending on the type of biopsy test completed, the patient normally receives the results within 72 hours.

If results are positive, the surgeon tries to see the patient within 24 hours of receiving the final reports. A metastatic work up is completed. Tests are often done to help the provider learn more about this specific cancer. For example, "hormone receptor tests can show whether the cancer is sensitive to hormones. Positive test results mean hormones help the cancer grow and the cancer is likely to respond to hormone treatment." ⁸⁸

Options are then discussed with an oncologist and a plastic surgeon. Where possible, the appointment with an oncologist is made within 2 weeks of the surgical procedure. A treatment plan is outlined, with input from the PCP, surgeon, oncologist and radiation therapist where appropriate. "Treatment depends on the size and location of the tumor in the breast, the results of the lab tests done on the cancer cells, and the stage or extent of the disease." ⁸⁹ Surgery, radiation therapy, chemotherapy and hormone therapy are the standard treatment options considered. The care plan is executed, usually within a few weeks of initial diagnosis. Side effects are many.

"The medical team makes every effort to help women return to their normal activities as soon as possible."⁹⁰ The recovery period and process will differ for each patient, depending on the degree of intervention and disease spread. The patient is seen for follow up care by several of the involved specialists, often for a longer period of time. (For example, cancer is considered to be in remission for five years, during which time the patient often continues to see the original oncologist.)

⁸⁸National Institutes of Health, National Cancer Institute, "What You Need To Know About Breast Cancer", page 9
⁸⁹National Institutes of Health, National Cancer Institute, "What You Need To Know About Breast Cancer", page 10
⁹⁰National Institutes of Health, National Cancer Institute, "What You Need To Know About Breast Cancer", page 4
EXHIBIT 4 - INTERVIEW QUESTIONS

Opening Question:

1. Tell me what you do in your job!

Questions about processes:

2. Can you tell me what the activities you engage in?
3. Can you tell me what activities make up this process?
4. What deadlines do you have to meet?
5. What paperwork do you encounter in your daily work?

Questions about activities:

6. Who performs in this activity (e.g. actors)?
7. What are the goals of this activity? What are you trying to accomplish?
8. What are the goals of the various departments or individuals engaged in this activity?
9. What forms, reports, or other paperwork must you complete or have available to complete this activity?
10. What forms or reports does this activity produce?
11. What else (e.g. product prototypes) does the activity produce?
12. What contextual factors are of critical importance to completing this activity (this includes issues, problems, exceptions, key performance measures, incentives, or interdependencies).
EXHIBIT 5: CHECKS AND BALANCES

Even before the recent scrutiny of the health care system, efforts were under way to examine the delivery of health care in the United States. "Concern about inappropriate and ineffective care led Congress to create the Agency for Health Care Policy and Research into the Public Health Service in 1989 to further the evaluation of current clinical practice. The agency's work so far has yielded many useful findings but few that actually identify themselves the most effective practices." 91

There are both formal and informal checks and balances that occur throughout the treatment process. At Emerson Hospital, all mammograms are read by two radiologists, more if a question arises. Pathology results are determined by two or more pathologists, with the final report not issued until after case presentation at the department meetings.

The HMOs perform ongoing audits, to insure compliance with guidelines and approval processes. In addition, each institution must annually submit information to the Massachusetts Professional Insurers Association with patient results and insurance information. "This year's Clinical Quality Report focuses almost exclusively on comparative data at the plan-wide and divisional level. Only the results of external studies performed at HCHP as well as other managed care organizations, or, internal HCHP studies performed at the Plan-wide level are reported." 92

"Late last month, an industry group called the National Committee of Quality Assurance released a model national HMO report card, comparing individual plans' immunization rates and other indicators with a national HMO average. In October, New England HMOs released data that could serve as a baseline for measuring a plan's performance over time in such areas as cervical cancer screening and cholesterol testing." 93 Exhibit 6 contains a partial portion of the above mentioned report card. Interesting to note that we somewhat randomly selected breast cancer as our malady, as well as the sites with whom we are working, who happen to have close (in some cases exclusive) relationships with HCHP, and the one area where HCHP is ranked as excellent is in mammography screening. An honest coincidence.

91 U.S. Department of Health and Human Service; Public Health Reports, "Efforts to Identify Health Technologies that Work Not Successful", January/February 1995

92 Harvard Community Health Plan, "Clinical Quality Report 1994"

EXHIBIT 6: HMO REPORT CARD

The Massachusetts Health Care Purchaser Group, a coalition representing more than 1 million public and private sector employee, retirees and their dependents, issued its first report looking at HMO quality last year. HMOs were compared to the average for all participating plans such as rates of mammography screening and asthma hospital admissions.

* Significantly better than average
⊕ Better than average
 Average
 ⊙ Worse than average
 - Significantly worse than average

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<th>0</th>
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<tbody>
<tr>
<td>Mammography screening</td>
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<td>Blood pressure screening</td>
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<td>Adult asthma</td>
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(2) Insufficient Data

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94 The Boston Globe, Monday, March 20, 1995 (partial report card included, due to space constraints.)
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<th>Goal</th>
<th>Actor</th>
<th>Artifacts</th>
<th>Dependencies</th>
<th>Type of Primary Dependency</th>
<th>Coordinating Mechanisms</th>
</tr>
</thead>
<tbody>
<tr>
<td>Collect Payment</td>
<td></td>
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</tr>
<tr>
<td>Bill Payment Provider</td>
<td>Compensation</td>
<td>Bills, reports</td>
<td>Processing contracts with patients, billing forms</td>
<td>Shared resource, prerequisite constraints</td>
<td>Notification, tracking, sequence, reports</td>
<td></td>
</tr>
<tr>
<td>Receive Payment</td>
<td>Compensation</td>
<td>Money</td>
<td>Payment by bill recipients, matching to patient history</td>
<td>Shared resource, prerequisite constraints</td>
<td>Notification, tracking, sequence, reports</td>
<td></td>
</tr>
<tr>
<td>Perform Case Management</td>
<td>Coordination, tracking, control</td>
<td>HCP Case Manager, Provider</td>
<td>Provider's MC contact, promise of compensation</td>
<td>Knowledge of network, cooperation, availability</td>
<td>Notification, tracking, sequence, reports</td>
<td></td>
</tr>
<tr>
<td>Request Permission to Provide Service</td>
<td></td>
<td></td>
<td>Provider's, Patient</td>
<td>Approval from HCP, patient situation, national standards, cooperation</td>
<td>Notification, tracking, sequence, reports</td>
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</tr>
<tr>
<td>Provide Early Detection</td>
<td></td>
<td></td>
<td>PCP, Nurse</td>
<td>Disease prevention, verbal communication, health information</td>
<td>Notification, tracking, sequence, reports</td>
<td></td>
</tr>
<tr>
<td>Provide Patient Education</td>
<td></td>
<td></td>
<td>Nurse, PCP, Specialist</td>
<td>Information about patient health, provider's education</td>
<td>Notification, tracking, sequence, reports</td>
<td></td>
</tr>
<tr>
<td>Educate Active Patients</td>
<td></td>
<td></td>
<td>Nurse, PCP, Specialist</td>
<td>Provide patient with information about services, referral information</td>
<td>Notification, tracking, sequence, reports</td>
<td></td>
</tr>
<tr>
<td>Distribute Information on Request</td>
<td></td>
<td></td>
<td>Nurse, PCP, Specialist</td>
<td>Information about services, referral information</td>
<td>Notification, tracking, sequence, reports</td>
<td></td>
</tr>
</tbody>
</table>

The table represents a series of activities and the dependencies and coordinations needed to perform them. Each activity is associated with specific goals, actors, artifacts, and dependencies. The type of primary dependency and the coordinating mechanisms are also listed.
<table>
<thead>
<tr>
<th><strong>Activity</strong></th>
<th><strong>Actor</strong></th>
<th><strong>Goal</strong></th>
<th><strong>Artifacts</strong></th>
<th><strong>Dependencies</strong></th>
<th><strong>Type of Primary Dependency</strong></th>
<th><strong>Coordinating Mechanisms</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Distribute Information</td>
<td>Nurse, PCP, Specialist, Physician</td>
<td>Provide Patient with information</td>
<td>Documentation, verbal information</td>
<td>Patient interest, Shared resource availability</td>
<td>Producer/consumer, Shared resource</td>
<td>ACS, scheduling, phone, mail</td>
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<tr>
<td>Teach Patient SBE</td>
<td>Patient, provider</td>
<td>Education</td>
<td>Open request</td>
<td>Access to provider</td>
<td>Shared resource</td>
<td>Phone, scheduling</td>
</tr>
<tr>
<td>Patient Requests Information</td>
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<tr>
<td>Teach SBE</td>
<td>Primary Care Physician</td>
<td>Educate Patient</td>
<td>Knowledge, documentation</td>
<td>Facilities, time, cooperation</td>
<td>Shared resource, Producer/consumer</td>
<td>Scheduling, phone</td>
</tr>
<tr>
<td>Answer Questions</td>
<td>Primary Care Physician</td>
<td></td>
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<tr>
<td>Patient Requests Information</td>
<td>Patient</td>
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<tr>
<td>Provide Information</td>
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<tr>
<td><strong>Monitor Patient Health</strong></td>
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<tr>
<td>Perform Initial Physical</td>
<td>Primary Care Physician</td>
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<tr>
<td>Establish Baseline</td>
<td>Primary Care Physician</td>
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<tr>
<td><strong>Perform Regular Mammograms</strong></td>
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</tr>
<tr>
<td>Recommend Mammogram</td>
<td>PCP, Specialist, ACS</td>
<td>Encourage preventative medicine</td>
<td>Documentation, medical order</td>
<td>Access, chart, Patient history, current national guidelines</td>
<td>Shared resource</td>
<td>Scheduling, phone, mail</td>
</tr>
<tr>
<td>Perform Mammogram</td>
<td>Primary Care Physician, Radiologist</td>
<td>Obtain image</td>
<td>Image</td>
<td>Facility, Patient and provider availability, time</td>
<td>Shared resource</td>
<td>Scheduling, facilities management</td>
</tr>
<tr>
<td>Assess Patient Mammography Rate</td>
<td></td>
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<tr>
<td><strong>Track Patient Records</strong></td>
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<tr>
<td><strong>Track Baselines</strong></td>
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</tr>
<tr>
<td>Perform Quality Audits</td>
<td>HMO/insurer personnel</td>
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<tr>
<td>Perform HMO/insurer Audit</td>
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</tr>
<tr>
<td>Compare Practices to Accepted Norms</td>
<td></td>
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<tr>
<td>Perform PCP Audit</td>
<td>Head Physician</td>
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</tr>
<tr>
<td>Perform Annual Audit</td>
<td>Head Physician</td>
<td>Trend determination, quality assurance, cost control</td>
<td>Documentation</td>
<td>Access to charts, accuracy and completeness of information</td>
<td>Shared resource, Producer/consumer</td>
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</tr>
<tr>
<td>Gather Data from Patient Records</td>
<td>Assistant, Provider</td>
<td>Data collection</td>
<td>Report, files, data</td>
<td>Access to and availability of information, time</td>
<td>Shared resource, Producer/consumer</td>
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<tr>
<td>Activity</td>
<td>Actor</td>
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<tr>
<td>Review Records</td>
<td>Head Physician</td>
<td>Determine quality and quantity control issues and trends</td>
<td>Documentation, knowledge</td>
<td>Time, access to information</td>
<td>Shared resource, Producer/consumer</td>
<td></td>
</tr>
<tr>
<td>Determine and Take Corrective Actions</td>
<td>Head Physician</td>
<td>Correct imperfections and create new options</td>
<td>Documentation, reports, reprimands and commendations</td>
<td>Time, access to information and violators</td>
<td>Shared resource, Producer/consumer</td>
<td>ACS, management</td>
</tr>
<tr>
<td>Perform Event Audit</td>
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<td>Alert mechanism, chart tracking, national guideline publication</td>
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<tr>
<td>Select Changed Diagnosis Record</td>
<td>Head Physician</td>
<td>Monitoring unusual cases</td>
<td>Knowledge, specific charts</td>
<td>Alert mechanism, access to information</td>
<td>Shared resource</td>
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<tr>
<td>Review Record</td>
<td>Head Physician</td>
<td>Quality assurance</td>
<td>Documentation</td>
<td>Access to charts and references</td>
<td>Shared resource, Producer/consumer</td>
<td>Scheduling</td>
</tr>
<tr>
<td>Determine and Take Corrective Actions</td>
<td>Head Physician</td>
<td>Quality assurance, regulation compliance</td>
<td>Reports, documentation</td>
<td>Authority, access to offenders</td>
<td>Shared resource, Producer/consumer</td>
<td>Management</td>
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<tr>
<td>Perform Follow-up Evaluations</td>
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<tr>
<td>Provide Medical Intervention</td>
<td>PCP, Specialist, Nurse</td>
<td>Patient health</td>
<td>Health, documentation, bills, data</td>
<td>Permission, facilities, education, money, care/Patient access</td>
<td>Shared resource, Producer/consumer</td>
<td>Scheduling, contracts, phone, computers national standards</td>
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<tr>
<td>Diagnose Patient</td>
<td>Providers</td>
<td>Determine current condition</td>
<td>Documentation, knowledge</td>
<td>Education, access, references</td>
<td>Shared resource</td>
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<tr>
<td>Review Chart</td>
<td>Physician, Providers</td>
<td>Understanding the Patient's health</td>
<td>Chart, Encounter Form</td>
<td>Shared resource/Knowledge Transfer</td>
<td>Shared resource</td>
<td>Scheduling</td>
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<tr>
<td>Question Patient</td>
<td>Physician</td>
<td>Determine condition and concerns</td>
<td>Knowledge, documentation</td>
<td>Access to Patient, honesty, education</td>
<td>Shared resource, Producer/consumer</td>
<td>Scheduling</td>
</tr>
<tr>
<td>Take History</td>
<td>Provider</td>
<td>Determine medical history</td>
<td>Chart</td>
<td>Access to Patient, honesty and cooperation</td>
<td>Shared resource, Producer/consumer</td>
<td>Facilities management, phone, scheduling</td>
</tr>
<tr>
<td>Examine Patient</td>
<td>Physician</td>
<td>Determine physical condition</td>
<td>Knowledge, documentation</td>
<td>Access to Patient, facilities, authorization</td>
<td>Shared resource, Producer/consumer</td>
<td>Scheduling, facilities management</td>
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<tr>
<td>Establish Current Condition</td>
<td>Provider</td>
<td>Determine current medical and mental condition</td>
<td>Information, baseline opinion</td>
<td>Access to Patient, facilities and equipment</td>
<td>Shared resource, Producer/consumer</td>
<td>Scheduling, education</td>
</tr>
<tr>
<td>Prepare Patient</td>
<td>Nurse, PCP</td>
<td>Mentally and physically prepare Patient for intervention</td>
<td>Knowledge and less hysteria</td>
<td>Facilities, Shared resource and Patient access</td>
<td>Shared resource, Producer/consumer</td>
<td>Scheduling, facilities management</td>
</tr>
<tr>
<td>Activity</td>
<td>Actor</td>
<td>Goal</td>
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<td>Dependencies</td>
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</tr>
<tr>
<td>Perform Procedure</td>
<td>Provider</td>
<td>Complete procedure, provide care</td>
<td>Documentation, altered Patient condition</td>
<td>Facilities, time, money, education, cooperation</td>
<td>Shared resource, Producer/consumer</td>
<td>Scheduling, facilities management, education system</td>
</tr>
<tr>
<td>Analyze Results</td>
<td>Provider</td>
<td>Determine outcomes</td>
<td>Documentation</td>
<td>Education, access to references, time</td>
<td>Shared resource, Producer/consumer</td>
<td></td>
</tr>
<tr>
<td>Add to Patient Record</td>
<td>Provider</td>
<td>Document all activity for future reference, the ability to share the information with other Providers, and protection from the law</td>
<td>Chart</td>
<td>Time, chart</td>
<td>Shared resource, Producer/consumer</td>
<td>Chart tracking</td>
</tr>
<tr>
<td>Examine Patient Condition</td>
<td>Provider</td>
<td>Determine physical condition</td>
<td>Knowledge, documentation</td>
<td>Access to Patient, facilities, authorization</td>
<td>Shared resource, Producer/consumer</td>
<td>Scheduling, facilities management</td>
</tr>
<tr>
<td>Prepare Patient</td>
<td>Nurse, PCP</td>
<td>Mentally and physically prepare Patient for intervention</td>
<td>Knowledge and less hysteria</td>
<td>Facilities, Shared resource and Patient access</td>
<td>Shared resource, Producer/consumer</td>
<td>Scheduling, facilities management</td>
</tr>
<tr>
<td>Perform Procedure</td>
<td>Physician</td>
<td>Complete procedure, provide care</td>
<td>Documentation, altered Patient condition</td>
<td>Facilities, time, money, education, cooperation</td>
<td>Shared resource, Producer/consumer</td>
<td>Scheduling, facilities management, education system</td>
</tr>
<tr>
<td>Analyze Results</td>
<td>Provider</td>
<td>Determine outcomes</td>
<td>Documentation</td>
<td>Education, access to references, time</td>
<td>Shared resource, Producer/consumer</td>
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</tr>
<tr>
<td>Add to Patient Record</td>
<td>Provider</td>
<td>Document all activity for future reference, the ability to share the information with other Providers, and protection from the law</td>
<td>Chart</td>
<td>Time, chart</td>
<td>Shared resource, Producer/consumer</td>
<td>Chart tracking</td>
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<tr>
<td>Order Diagnostic Test</td>
<td>PCP, Specialist</td>
<td>Order appropriate tests for diagnosis determination</td>
<td>Order forms, chart</td>
<td>Chart, time, knowledge</td>
<td>Shared resource, Producer/consumer</td>
<td>Medical ordering system</td>
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<tr>
<td>Perform Diagnostic Tests</td>
<td>PCP, Specialist</td>
<td>Determine condition in order to establish next steps</td>
<td>Test results, information</td>
<td>Time, facilities access, equipment access</td>
<td>Shared resource, Producer/consumer</td>
<td>Scheduling, facilities management, education system</td>
</tr>
<tr>
<td>Prepare Patient</td>
<td>Nurse</td>
<td>Mentally and physically prepare Patient for intervention</td>
<td>Knowledge and less hysteria</td>
<td>Facilities, Shared resource and Patient access</td>
<td>Shared resource, Producer/consumer</td>
<td>Scheduling, facilities management</td>
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<td>Activity</td>
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<tr>
<td>Perform Procedure</td>
<td>Physician</td>
<td>Complete procedure, provide care</td>
<td>Documentation, altered Patient condition</td>
<td>Facilities, time, money, education, cooperation</td>
<td>Shared resource, Producer/consumer</td>
<td>Scheduling, facilities management, education system</td>
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<tr>
<td>Analyze Results</td>
<td>Physician</td>
<td>Determine outcomes</td>
<td>Documentation</td>
<td>Education, access to references, time</td>
<td>Shared resource, Producer/consumer</td>
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<tr>
<td>Add to Patient Record</td>
<td>Physician</td>
<td>Document all activity for future reference, the ability to share the information with other Providers, and protection from the law</td>
<td>Chart</td>
<td>Time, chart</td>
<td>Shared resource, Producer/consumer</td>
<td>Chart tracking</td>
</tr>
<tr>
<td>Consult References</td>
<td>Providers</td>
<td>Obtain outside information, additional opinions</td>
<td>Information, knowledge, documentation</td>
<td>Access to Shared resource (both written and colleagues), time</td>
<td>Shared resource, Producer/consumer</td>
<td>Libraries, relationships, national publications</td>
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<tr>
<td>Get Shared resources</td>
<td>Providers</td>
<td>Obtain information, contact colleagues</td>
<td>Documentation, advice</td>
<td>Access to literature and experts</td>
<td>Shared resource, Producer/consumer</td>
<td>Professional relationships, publications</td>
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<tr>
<td>Read Shared resources</td>
<td>Providers</td>
<td>Absorb and analyze information</td>
<td>Knowledge</td>
<td>Time, understanding</td>
<td>Shared resource, Producer/consumer</td>
<td>Education system</td>
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<tr>
<td>Make Judgment</td>
<td>Providers</td>
<td>Apply knowledge to situation and determine opinion</td>
<td>Documentation</td>
<td>Time, understanding, analytic ability</td>
<td>Shared resource, Producer/consumer</td>
<td>Education and professional experiences</td>
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<tr>
<td>Consult Specialists</td>
<td>Providers</td>
<td>Obtain expertise</td>
<td>Knowledge, documentation, confirmation/controversy</td>
<td>Access to Shared resources</td>
<td>Shared resource, Producer/consumer</td>
<td>Professional relationships</td>
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<tr>
<td>Get Shared resources</td>
<td>Providers</td>
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<td>Access to Shared resources, common language and understanding</td>
<td>Shared resource, Producer/consumer</td>
<td>Medical system</td>
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<tr>
<td>Talk to Shared resources</td>
<td>Providers</td>
<td>Obtain alternative opinions and expertise</td>
<td>Documentation</td>
<td>Access to Shared resources, common language and understanding</td>
<td>Shared resource, Producer/consumer</td>
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<tr>
<td>Make Judgment</td>
<td>Providers</td>
<td></td>
<td></td>
<td>Access to Shared resources, common language and understanding</td>
<td>Shared resource, Producer/consumer</td>
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</tr>
<tr>
<td>Confirm Patient Condition and Record</td>
<td>Providers</td>
<td>Establish treatment base, make information available to others</td>
<td>Chart</td>
<td>Professional expertise, access</td>
<td>Shared resource, Producer/consumer</td>
<td>Education system, scheduling, record tracking</td>
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<tr>
<td>Perform Triage Nurse Assessment</td>
<td>Triage Nurse</td>
<td>Get Patient medical treatment if needed</td>
<td>telephone, Patient records, consultation log</td>
<td>Professional guidelines, access to information</td>
<td>Shared resource, Producer/consumer</td>
<td>AMC triage system, national healthcare guidelines</td>
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<tr>
<td>Question Patient</td>
<td>Triage Nurse</td>
<td>Find out why Patient is calling</td>
<td>telephone</td>
<td>Patient communication</td>
<td>Usability</td>
<td>Triage system, telephone</td>
</tr>
<tr>
<td>Activity</td>
<td>Actor</td>
<td>Goal</td>
<td>Artifacts</td>
<td>Dependencies</td>
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</tr>
<tr>
<td>Review Chart</td>
<td>Triage Nurse</td>
<td>Learn Patient history</td>
<td>Patient records</td>
<td>Access to chart, education</td>
<td>Shared resource, usability</td>
<td>Record tracking system</td>
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<tr>
<td>Consult References</td>
<td>Triage Nurse</td>
<td>Select recommendation for Patient</td>
<td>automated/manual records</td>
<td>Guideline understanding, authority</td>
<td>Usability</td>
<td>Education system</td>
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<tr>
<td>Consult Specialists</td>
<td>Triage Nurse, Specialists</td>
<td>Select recommendation for Patient</td>
<td>telephone</td>
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<tr>
<td>Confirm Patient Condition and Record</td>
<td>Triage Nurse</td>
<td>Identify ailment and record in charts</td>
<td>Patient record</td>
<td>Access to charts and shared resources</td>
<td>Shared resource, producer/consumer</td>
<td>Medical system</td>
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<tr>
<td>Refer Patient to PCP</td>
<td>Triage Nurse, Appointment Staff</td>
<td>Get Patient treated</td>
<td>telephone, consultation log</td>
<td>Understanding of system, authority</td>
<td>Shared resource, producer/consumer</td>
<td>Medical system</td>
</tr>
<tr>
<td>Perform PCP Diagnosis</td>
<td>Primary Care Physician</td>
<td>Find lump or abnormality</td>
<td>encounter sheet</td>
<td>early diagnosis depends on patient fear and level of self examination</td>
<td></td>
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<tr>
<td>Review Chart</td>
<td>PCP</td>
<td>Determine Patient Condition, past and present</td>
<td>Chart</td>
<td>Accuracy of and access to information</td>
<td>Shared resource</td>
<td>Chart tracking and delivery system</td>
</tr>
<tr>
<td>Question Patient</td>
<td>Primary Care Physician</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Take History</td>
<td>Provider</td>
<td>Determine medical history</td>
<td>Chart</td>
<td>Access to patient, honesty and cooperation</td>
<td>Shared resource, producer/consumer</td>
<td>Facilities management, phone, scheduling</td>
</tr>
<tr>
<td>Examine Patient</td>
<td>Physician</td>
<td>Determine physical condition</td>
<td>Knowledge, documentation</td>
<td>Access to patient, facilities, authorization</td>
<td>Shared resource, producer/consumer</td>
<td>Scheduling, facilities management</td>
</tr>
<tr>
<td>Establish Current Condition</td>
<td>PCP</td>
<td>Determine current medical and mental condition</td>
<td>Information, baseline opinion</td>
<td>Access to patient, facilities and equipment</td>
<td>Shared resource, producer/consumer</td>
<td>Scheduling, education</td>
</tr>
<tr>
<td>Perform Breast Examination</td>
<td>PCP</td>
<td>Determine current physical status (breast)</td>
<td>Results</td>
<td>Access to patient, facility assessments</td>
<td>Shared resource, producer/consumer</td>
<td>Medical education, scheduling</td>
</tr>
<tr>
<td>Perform Diagnostic Tests</td>
<td>PCP</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Consult References (Literature, colleagues)</td>
<td>PCP</td>
<td>Gain additional professional insights</td>
<td>Information</td>
<td>Access to colleagues, literature</td>
<td>Shared resource, producer/consumer</td>
<td>Professional relationships, Medical Publications</td>
</tr>
<tr>
<td>Consult Specialists</td>
<td>PCP</td>
<td>Seek advise from specific experts</td>
<td>Information</td>
<td>Access, common language and understanding</td>
<td>Shared resource, producer/consumer</td>
<td>Professional relationships, medical networks</td>
</tr>
<tr>
<td>Activity</td>
<td>Actor</td>
<td>Goal</td>
<td>Artifacts</td>
<td>Dependencies</td>
<td>Type of Primary Dependency</td>
<td>Coordinating Mechanisms</td>
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</tr>
<tr>
<td>Confirm Patient Condition and Record</td>
<td>PCP</td>
<td>Identify ailment and record in charts</td>
<td>Patient record</td>
<td>Access to charts and Shared resources</td>
<td>Shared resource, Producer/consumer</td>
<td>Medical system</td>
</tr>
<tr>
<td>Determine Referral Option</td>
<td>PCP, Member Services</td>
<td>Examine treatment options and determine next course of action, and determine responsible player therefor</td>
<td>HCHP guidelines, professional guidelines</td>
<td>Access to guidelines, determination of Patient situation</td>
<td>Shared resource, Producer/consumer</td>
<td>Medical education system, contract details</td>
</tr>
<tr>
<td>Diagnose Patient</td>
<td>Patient</td>
<td>Find lump or abnormality</td>
<td>none</td>
<td>Patient must perform BSE</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Perform Radiology Diagnosis</td>
<td>Radiologist</td>
<td>Confirm lump is cancerous</td>
<td></td>
<td>depends on PCP notification and description of malady, use preferred Specialist</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Review Chart</td>
<td>Radiologist</td>
<td>Determine Patient Condition, past and present</td>
<td>Chart</td>
<td>Accuracy of and access to information</td>
<td>Shared resource</td>
<td>Chart tracking and delivery system</td>
</tr>
<tr>
<td>Review Patient History</td>
<td>Radiologist</td>
<td>Review previous images, if any</td>
<td>Chart</td>
<td>Access to images</td>
<td>Shared resource, Producer/consumer</td>
<td>Chart and image tracking system</td>
</tr>
<tr>
<td>Review Biopsy Results</td>
<td>Radiologist</td>
<td>Determine results of procedure</td>
<td>Result reporting</td>
<td>Results, education</td>
<td>Shared resource, Producer/consumer</td>
<td>Medical Education, image tracking</td>
</tr>
<tr>
<td>Question Patient</td>
<td>Radiologist</td>
<td>Determine current condition and concerns</td>
<td>documentation and understanding of situation</td>
<td>contact with Patient, communication</td>
<td>Shared resource, Producer/consumer</td>
<td>Scheduling</td>
</tr>
<tr>
<td>Examine Patient</td>
<td>Radiologist</td>
<td>Determine physical condition</td>
<td>Knowledge, documentation</td>
<td>Access to Patient, facilities, authorization</td>
<td>Shared resource, Producer/consumer</td>
<td>Scheduling, facilities management</td>
</tr>
<tr>
<td>Perform Mammography</td>
<td>Radiologist</td>
<td>Perform radiological procedure</td>
<td>image</td>
<td>authority, education, facilities</td>
<td>Shared resource, Producer/consumer</td>
<td>Scheduling, facilities management</td>
</tr>
<tr>
<td>Compare to Baseline Mammographies</td>
<td>Radiologist</td>
<td>Compare new image to old</td>
<td>report</td>
<td>Access to previous images, common understanding and interpretation</td>
<td>Shared resource, Producer/consumer</td>
<td>Chart tracking and delivery</td>
</tr>
<tr>
<td>Consult References</td>
<td>Radiologist</td>
<td>Gain additional professional insights</td>
<td>Information</td>
<td>Access to colleagues, literature</td>
<td>Shared resource, Producer/consumer</td>
<td>Professional relationships, Medical Publications</td>
</tr>
<tr>
<td>Consult Specialist (Surgeon)</td>
<td>Radiologist</td>
<td>Seek advise from specific experts</td>
<td>Information</td>
<td>Access, common language and understanding</td>
<td>Shared resource, Producer/consumer</td>
<td>Professional relationships, medical networks</td>
</tr>
<tr>
<td>Activity</td>
<td>Actor</td>
<td>Goal</td>
<td>Artifacts</td>
<td>Dependencies</td>
<td>Type of Primary Dependency</td>
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</tr>
<tr>
<td>Confirm Patient Condition and Record</td>
<td>Radiologist</td>
<td>Identify ailment and record in charts</td>
<td>Patient record</td>
<td>Access to charts and Shared resources</td>
<td>Shared resource, Producer/consumer</td>
<td>Medical system</td>
</tr>
<tr>
<td>Attend Tumor Board</td>
<td>Radiologist</td>
<td>Present Patient case, and participate in treatment plan discussions and determinations</td>
<td>Charts, recommendation for treatment</td>
<td>Access to charts, understanding of various specialties, cooperation between Specialists</td>
<td>Shared resource, Producer/consumer</td>
<td>Scheduling</td>
</tr>
<tr>
<td>Perform Surgical Diagnosis</td>
<td>Surgeon</td>
<td>Confirms lump is cancerous</td>
<td></td>
<td>needs specific mapping of malady, use preferred Specialist</td>
<td>Simultaneity constraints, Shared resources</td>
<td></td>
</tr>
<tr>
<td>Review Chart</td>
<td>Surgeon</td>
<td>Determine Patient condition</td>
<td>Patient records</td>
<td>Access to chart</td>
<td>Simultaneity constraints, Shared resources</td>
<td></td>
</tr>
<tr>
<td>Question Patient</td>
<td>Surgeon</td>
<td>Determine Patient condition</td>
<td></td>
<td>Access to patient</td>
<td>Simultaneity constraints, Shared resources</td>
<td></td>
</tr>
<tr>
<td>Examine Patient</td>
<td>Surgeon</td>
<td>Determine Patient condition</td>
<td></td>
<td>Access to patient</td>
<td>Simultaneity constraints, Shared resources</td>
<td></td>
</tr>
<tr>
<td>Perform Needle Biopsy</td>
<td>Surgeon</td>
<td>Remove lump for examination</td>
<td>Medical order</td>
<td>Access to patient, equipment, surgical room</td>
<td>Shared resource, Producer/consumer</td>
<td>Scheduling</td>
</tr>
<tr>
<td>Perform Frozen Section Biopsy</td>
<td>Surgeon</td>
<td>Remove lump for examination</td>
<td>Medical order</td>
<td>Access to patient, equipment, surgical room</td>
<td>Shared resource, Producer/consumer</td>
<td>Scheduling</td>
</tr>
<tr>
<td>Perform Paraffin Block Biopsy</td>
<td>Surgeon</td>
<td>Remove lump for examination</td>
<td>Medical order</td>
<td>Access to patient, equipment, surgical room</td>
<td>Shared resource, Producer/consumer</td>
<td>Scheduling</td>
</tr>
<tr>
<td>Consult References</td>
<td>Surgeon</td>
<td>Check for information and clarification</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Confirm Patient Condition and Record</td>
<td>Surgeon</td>
<td>Document Diagnosis</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Perform Pathologist Diagnosis</td>
<td>Pathologist</td>
<td>Confirm lump is cancerous</td>
<td>Report</td>
<td>Lab tests, Patient in system, facilities</td>
<td>Shared resource, Producer/consumer</td>
<td>scheduling, facilities management</td>
</tr>
<tr>
<td>Review Lab Request</td>
<td>Pathologist</td>
<td>Determine what test is needed</td>
<td>Decision to proceed</td>
<td>Common language, order</td>
<td>Shared resource, Producer/consumer, usability</td>
<td>Medical profession communication mechanisms</td>
</tr>
<tr>
<td>Test Specimen</td>
<td>Pathologist</td>
<td>Get information</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Activity</td>
<td>Actor</td>
<td>Goal</td>
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</tr>
<tr>
<td>Test for Cancer</td>
<td>Pathologist</td>
<td>Determine if specimen is cancerous</td>
<td>Result/report</td>
<td>Medical Education, access to sample, facilities</td>
<td>Shared resource, Producer/consumer</td>
<td>Lab testing system</td>
</tr>
<tr>
<td>Test for Hormone Sensitivity</td>
<td>Pathologist</td>
<td>Determine if hormone sensitivities exist</td>
<td>Result/report</td>
<td>Medical Education, access to sample, facilities</td>
<td>Shared resource, Producer/consumer</td>
<td>Lab testing system</td>
</tr>
<tr>
<td>Check Against Norms</td>
<td>Pathologist</td>
<td>Check results against standards to determine condition</td>
<td>Result/report</td>
<td>Access to national results</td>
<td>Shared resource, Producer/consumer</td>
<td>Medical profession information sharing</td>
</tr>
<tr>
<td>Check Against National Norms</td>
<td>Pathologist</td>
<td>Compare results to national results</td>
<td>Report</td>
<td>Access to previous Patient results</td>
<td>Shared resource, Producer/consumer</td>
<td>Medical education, charting system</td>
</tr>
<tr>
<td>Check Against Patient Baseline</td>
<td>Pathologist</td>
<td>Compare results to previous results for same Patient</td>
<td>Report</td>
<td>Access to previous Patient results</td>
<td>Shared resource, Producer/consumer</td>
<td>Medical education, charting system</td>
</tr>
<tr>
<td>Confirm Sample Condition</td>
<td>Pathologist</td>
<td>Determine nature of sample</td>
<td>Review findings</td>
<td>Medical education, access to results</td>
<td>Shared resource, Producer/consumer</td>
<td>Professional responsibilities</td>
</tr>
<tr>
<td>Pathologist Evaluation</td>
<td>Pathologist</td>
<td>Review findings and make judgment</td>
<td>Report</td>
<td>Medical Education, access to results</td>
<td>Shared resource, Producer/consumer</td>
<td>Professional responsibilities</td>
</tr>
<tr>
<td>Pathology Department Evaluation</td>
<td>Pathology</td>
<td>Review reports and reach consensus on judgment, present and confirm judgments</td>
<td>Report</td>
<td>Medical Education, access to result, time together, pathologist report</td>
<td>Shared resource, Producer/consumer, usability</td>
<td>Departmental interactions</td>
</tr>
<tr>
<td>Record Findings in Patient Record</td>
<td>Pathologist</td>
<td>Identify ailment and record in charts</td>
<td>Patient record</td>
<td>Access to charts and Shared resources</td>
<td>Shared resource, Producer/consumer</td>
<td>Medical system</td>
</tr>
<tr>
<td>Perform Oncologist Diagnosis</td>
<td>Oncologist</td>
<td>Confirm lump is cancerous</td>
<td>Referral form</td>
<td>Access to patient, chart, references</td>
<td>Simultaneity constraints, Shared resources</td>
<td></td>
</tr>
<tr>
<td>Review Chart</td>
<td>Oncologist</td>
<td>Determine Patient condition</td>
<td>Patient records</td>
<td>Access to chart</td>
<td>Simultaneity constraints, Shared resources</td>
<td></td>
</tr>
<tr>
<td>Question Patient</td>
<td>Oncologist</td>
<td>Determine Patient condition</td>
<td>Patient records</td>
<td>Access to patient</td>
<td>Simultaneity constraints, Shared resources</td>
<td></td>
</tr>
<tr>
<td>Examine Patient</td>
<td>Oncologist</td>
<td>Determine Patient condition</td>
<td>Access to patient</td>
<td>Simultaneity constraints, Shared resources</td>
<td>Simultaneity constraints, Shared resources</td>
<td></td>
</tr>
<tr>
<td>Consult References</td>
<td>Oncologist</td>
<td>Check for information and clarification</td>
<td>Literature, notices</td>
<td>Access to references</td>
<td>Simultaneity constraints, Shared resources</td>
<td></td>
</tr>
<tr>
<td>Activity</td>
<td>Actor</td>
<td>Goal</td>
<td>Artifacts</td>
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<tr>
<td>Check for Pharmacological Conflicts</td>
<td>Oncologist</td>
<td>Ensure Patient can receive pharmacological treatment without any ill side effects</td>
<td>Literature, notices</td>
<td>Access to references</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Confirm Patient Condition and Record</td>
<td>Oncologist</td>
<td>Document diagnosis</td>
<td>Patient record</td>
<td>Access to patient records</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Select From Treatment Options</td>
<td>PCP, Specialist</td>
<td>Establish next step</td>
<td>Documentation, knowledge</td>
<td>Education, accurate information</td>
<td>Producer/consumer</td>
<td>Phone, chart, published guidelines</td>
</tr>
<tr>
<td>Generate PCP Treatment Choice</td>
<td>PCP</td>
<td>Choose proper treatment measure</td>
<td>Recommendations report</td>
<td>Guidelines, common language, access to Patient</td>
<td>Shared resource</td>
<td>Scheduling, facilities management</td>
</tr>
<tr>
<td>Assemble Patient, PCP, and Surgeon</td>
<td>PCP, Surgeon, Oncologist</td>
<td>Work together to determine best next step</td>
<td>Report</td>
<td>Common language, cooperation</td>
<td>Shared resource</td>
<td>Scheduling, common medical understanding</td>
</tr>
<tr>
<td>Discuss Options</td>
<td>PCP, Surgeon, Oncologist</td>
<td>Work together to determine best next step</td>
<td>Discussion</td>
<td>Common understanding of situation and malady</td>
<td>Shared resource</td>
<td>Scheduling</td>
</tr>
<tr>
<td>Select Treatment</td>
<td>PCP, Surgeon, Oncologist</td>
<td>Select best treatment</td>
<td>Report</td>
<td>Common understanding of treatment options and components</td>
<td>Shared resource</td>
<td>Scheduling, common medical language</td>
</tr>
<tr>
<td>Generate Review Board Choice</td>
<td>Tumor Board, PCP, Surgeon, Oncologist</td>
<td>Choose proper treatment measure, allocate Shared resources</td>
<td>Patient Records</td>
<td>Opinions of board, availability of resources, current medical trends</td>
<td>Shared resource</td>
<td>Scheduling, common medical understanding</td>
</tr>
<tr>
<td>Assemble Review Board</td>
<td>Tumor Board, PCP, Surgeon, Oncologist</td>
<td>Work together to determine best next step</td>
<td>Report</td>
<td>Common language, cooperation</td>
<td>Shared resource</td>
<td>Scheduling, common medical understanding</td>
</tr>
<tr>
<td>Discuss Options by Reviewing Record</td>
<td>Tumor Board, PCP, Surgeon, Oncologist</td>
<td>Work together to determine best next step</td>
<td>Discussion</td>
<td>Common understanding of situation and malady</td>
<td>Shared resource</td>
<td>Scheduling</td>
</tr>
<tr>
<td>Select Treatment</td>
<td>Tumor Board, PCP, Surgeon, Oncologist</td>
<td>Select best treatment</td>
<td>Report</td>
<td>Common understanding of treatment options and components</td>
<td>Shared resource</td>
<td>Scheduling, common medical language</td>
</tr>
<tr>
<td>Perform Intervention</td>
<td>PCP, Specialist, Nurse</td>
<td>Treat malady</td>
<td>Documentation, Patient condition</td>
<td>Facilities, money, Patient, permission, treatment selection</td>
<td>Producer/consumer</td>
<td>Phone, institution, contracts, relationships</td>
</tr>
<tr>
<td>Provide Surgical Treatment</td>
<td>Surgeon</td>
<td>Remove cancerous cells</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Activity</td>
<td>Actor</td>
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</tr>
<tr>
<td>Prepare Patient</td>
<td>Nurse</td>
<td>Prepare Patient both mentally and physically for drug administration. Patient education is important here.</td>
<td>Documentation, educated Patient</td>
<td>Access to Patient, facilities, previous orders</td>
<td>Shared resource, Producer/consumer</td>
<td>Medical system</td>
</tr>
<tr>
<td>Review Patient Chart</td>
<td>Surgeon/Nurse</td>
<td>Determine Patient Condition, past</td>
<td>Chart</td>
<td>Accuracy of and access to information</td>
<td>Shared resource</td>
<td>Chart tracking and delivery system</td>
</tr>
<tr>
<td>Question and Educate Patient</td>
<td>Surgeon/Nurse</td>
<td>Determine current condition</td>
<td>Chart</td>
<td>Access to Patient, Patient desire to be educated</td>
<td>Shared resource, Producer/consumer</td>
<td>Scheduling</td>
</tr>
<tr>
<td>Cloth Patient for Procedure</td>
<td>Nurse</td>
<td>Prepare Patient for procedure</td>
<td>Ready Patient</td>
<td>Facilities, time, money, scheduling</td>
<td>Shared resource, Producer/consumer</td>
<td>Scheduling, medical system</td>
</tr>
<tr>
<td>Administer Medication</td>
<td>Nurse</td>
<td>Provide Patient with necessary medications</td>
<td>Treated Patient, documentation</td>
<td>Inventory and facilities availability</td>
<td>Shared resource, Producer/consumer</td>
<td>Scheduling, facilities management</td>
</tr>
<tr>
<td>Move Patient</td>
<td>Patient, Nurse, Orderly</td>
<td>Transition to next stage of care</td>
<td>Permission by physician, patient charts</td>
<td>Permission, access</td>
<td>Prerequisite constraints, usability, approval</td>
<td>Physician review</td>
</tr>
<tr>
<td>Perform intervention</td>
<td>Nurse, Surgeon</td>
<td>Perform procedure</td>
<td>Healthier Patient</td>
<td>Facilities, education, time</td>
<td>Shared resource, Producer/consumer</td>
<td>Scheduling, medical education/accreditation system</td>
</tr>
<tr>
<td>Perform Lumpectomy</td>
<td>Surgeon</td>
<td>Remove cancerous lump</td>
<td>Healthier Patient</td>
<td>Facilities, education, time</td>
<td>Shared resource, Producer/consumer</td>
<td>Scheduling, medical education/accreditation system</td>
</tr>
<tr>
<td>Perform Partial Mastectomy</td>
<td>Surgeon</td>
<td>Remove cancerous part of breast</td>
<td>Healthier Patient</td>
<td>Facilities, education, time</td>
<td>Shared resource, Producer/consumer</td>
<td>Scheduling, medical education/accreditation system</td>
</tr>
<tr>
<td>Perform Total Mastectomy</td>
<td>Surgeon</td>
<td>Remove entire breast</td>
<td>Healthier Patient</td>
<td>Facilities, education, time</td>
<td>Shared resource, Producer/consumer</td>
<td>Scheduling, medical education/accreditation system</td>
</tr>
<tr>
<td>Perform Radical Mastectomy</td>
<td>Surgeon</td>
<td>Remove entire breast</td>
<td>Healthier Patient</td>
<td>Facilities, education, time</td>
<td>Shared resource, Producer/consumer</td>
<td>Scheduling, medical education/accreditation system</td>
</tr>
<tr>
<td>Activity</td>
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</tr>
<tr>
<td>Perform Reconstrcutive Surgery</td>
<td>Surgeon</td>
<td>Rebuild breast form</td>
<td>Healthier Patient</td>
<td>Facilities, education, time</td>
<td>Shared resource, Producer/consumer</td>
<td>Scheduling, medical education/accreditation system</td>
</tr>
<tr>
<td>Perform Gland Removal</td>
<td>Surgeon</td>
<td>Remove hormonal glands</td>
<td>Healthier Patient</td>
<td>Facilities, education, time</td>
<td>Shared resource, Producer/consumer</td>
<td>Scheduling, medical education/accreditation system</td>
</tr>
<tr>
<td>Move Patient</td>
<td>Patient, Nurse, Orderly</td>
<td>Transition to next stage of care</td>
<td>Permission by physician, patient charts</td>
<td>Permission, access</td>
<td>Prerequisite constraints, usability, approval</td>
<td>Physician review</td>
</tr>
<tr>
<td>Provide Radiological Treatment</td>
<td>Radiologist</td>
<td>Kill cancerous cells</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Prepare Patient</td>
<td>Nurse</td>
<td>Prepare Patient both mentally and physically for drug administration. Patient education is important here.</td>
<td>Documentation, educated Patient</td>
<td>Access to Patient, facilities, previous orders</td>
<td>Shared resource, Producer/consumer</td>
<td>Medical system</td>
</tr>
<tr>
<td>Treat with Radiation</td>
<td>Radiologist</td>
<td>Perform radiation therapy</td>
<td>Irradiated Patient</td>
<td>Facilities, medical orders, authorization</td>
<td>Shared resource, Producer/consumer</td>
<td>Scheduling, MC</td>
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<td>Move Patient</td>
<td>Patient, Nurse, Orderly</td>
<td>Transition to next stage of care</td>
<td>Permission by physician, patient charts</td>
<td>Permission, access</td>
<td>Prerequisite constraints, usability, approval</td>
<td>Physician review</td>
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<tr>
<td>Provide Chemotherapy Treatment</td>
<td>Oncologist</td>
<td>Kill cancerous cells</td>
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<tr>
<td>Prepare Patient</td>
<td>Nurse</td>
<td>Prepare Patient both mentally and physically for drug administration. Patient education is important here.</td>
<td>Documentation, educated Patient</td>
<td>Access to Patient, facilities, previous orders</td>
<td>Shared resource, Producer/consumer</td>
<td>Medical system</td>
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<tr>
<td>Administer Medication</td>
<td>Nurse</td>
<td>Provide Patient with necessary medications</td>
<td>Treated Patient, documentation</td>
<td>Inventory and facilities availability</td>
<td>Shared resource, Producer/consumer</td>
<td>Scheduling, facilities management</td>
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<tr>
<td>Administer Drugs</td>
<td>Nurse</td>
<td>Provide Patient with necessary medications</td>
<td>Treated Patient, documentation</td>
<td>Inventory and facilities availability</td>
<td>Shared resource, Producer/consumer</td>
<td>Scheduling, facilities management</td>
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<td>Administer Hormones</td>
<td>Nurse</td>
<td>Provide Patient with necessary medications</td>
<td>Treated Patient, documentation</td>
<td>Inventory and facilities availability</td>
<td>Shared resource, Producer/consumer</td>
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<td>Goal</td>
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<td>Dependencies</td>
<td>Coordinating Mechanisms</td>
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<td>Provide Psychological</td>
<td>Prepare Patient with ongoing</td>
<td>Calmer, less hysterical</td>
<td>Time, sensitivity to Patient needs</td>
<td>Relationships between Patients and</td>
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<td>Treatment</td>
<td>counseling as needed</td>
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<td>Perform Psychological</td>
<td>Work with Patient to understand</td>
<td>Calmer, less hysterical</td>
<td>Time, facilities access to Patients, support</td>
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<td>Provide counseling, drugs,</td>
<td>Provide counseling, drugs, and</td>
<td>Mind body connection in recovery process</td>
<td>Time, access to Patient, support services</td>
<td>Communication between Providers,</td>
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<td>and support as needed</td>
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<td>Move Patient</td>
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<td>Physician review</td>
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<td>Provide Recuperative</td>
<td>Transition to next stage of care</td>
<td>Documentation, health</td>
<td>Patient, knowledge, patient charts</td>
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<td>Medical Care</td>
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<tr>
<td>Perform Physical Therapy</td>
<td>Counselor</td>
<td>Referral form</td>
<td>Availability of specialists and equipment</td>
<td>Scheduling, first come/first serve</td>
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<td>Assess Medical Care</td>
<td>Physical Therapist</td>
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<td>Scheduling, first come/first serve</td>
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APPENDIX B: INTERVIEW NOTES

(Note: All names of people and locations have been changed. )

Interviewee: Chief Executive Officer, "Joe"
Location: Hospital-1
Date: 7 December 1994

Our site advisor introduced our project and the three main areas in which the center is interested: Coordinating mechanisms, dependencies and representation of capturing processes. The process should support patients across primary, secondary and tertiary care. We want to look at parts of larger organizations that need to cooperate. One of the drivers will be incentives. This is currently activity based for the clinicians. Another driver will be disaggregated information. But information is indeed needed throughout the continuum of care.

Joe agreed that IT is needed to manage patients across levels of care, perhaps even across geographical boundaries. We should look at how care is given longitudinally. There is currently an industry wide emphasis on preventative care, done outside of the traditional hospital walls. Looking at national trends, the Health Care Advisory Board, with 1100 member hospitals, looks at best demonstrated practices. He suggested considering home care, or sub acute care. Or at looking at patients when they are not critically ill, such as diabetics or high risk mothers. Who do practitioners currently choose to follow quite closely, and why? There are different approaches being taken but technically and organizationally across the country. How could such a system look for a single hospital? He suggested we look at a single institution.

Several ideas were provided for possible areas to examine closely: Practice protocols and guidelines, types of technology being used, organizational implications and successful/failed implementation of both. Joe suggested we look at different organizational forms, for instance places where doctors are actual employees of the hospital vs. not. How do control systems work? What are the dependencies? Do they operate differently? Each system would have different incentive structures as well.

Do doctors respond to data? What are the organically driven cultural norms. How much of tangible vs. intangibles are driving the system? Are hospitals providing the community services needed? What are meaningful indicators? Hospitals are becoming more publicly responsible, and need to expand their mission beyond what health care institutions are doing today.

Interview: Consultant, "Mary"
Location: Hospital-1
Date: 2 February 1995
We described the work we were doing, and explained that we are looking for things that fall through the organizational cracks, are not managed properly and where there is a lack of coordination.

Mary discussed protocol development. The focus is on "what". Decision trees are being developed, looking at "what" is done. There is no attention to coordinating mechanisms in clinical protocol development. This is the basis of Kaiser Plans, books with decision trees. Often the "what" doesn't happen. E.G. an older doctor does not know new medical protocols, or the major caregiver is simply unaware of protocol existence or changes.

Example: stroke patients: receive acute treatment in the hospital, then transition into rehabilitation. This treatment plan is very common, very expensive and has vastly different outcomes. The treatments will vary patient to patient, based on what an individual can tolerate. When a patient moves to rehabilitation they go into the care of someone else, someone new. The communication between providers on condition and capabilities is often incomplete due to the lack of relationships between the providers. Some institutions are good at insuring that all information gets passed along with the patient. A critical issue is how the primary care doctors work with the specialists.

What happens in a group where the doctors are not organized? Under capitation, what will happen where $ are so tight? There is currently no informal structure that allows needed communications to occur. What can be done to create a compensating structure?

Mary recommended that we identify critical points of communication in a treatment process or diagnosis, across the entire continuum of care. We should identify breakdowns, barriers, what gets in the way. We should focus on types, frequencies, relationships between the breakdowns and organization forms.

**Interview:** Chief Executive Officer, "Joe"
**Location:** Outpatient Medical Clinic-A
**Date:** 2 February 1995

There are different types of HMOs, for example straight HMO, PPO, etc. Under a straight HMO the providers are under contract with the HMO, anyone outside "the network" is not paid for. Under "preferred provider" programs, any provider in the network is covered in full, those outside are covered 70%. There is more freedom to choose for the patients.

Most employers pay for the insurance. They sign a contract with an HMO, which delineates which services will be provided and at what premiums. The premiums are different, often dependent on the population and demographic distribution. Employees do get some choices. They can choose the primary care provider from whom they want to receive care: pediatrician, internist or family practitioner. They must pick one, at a
specific location. This is then considered to be the patient "home site" and "primary care physician" (PCP).

Clinic-A then has a contract with HMO-1 to provide care. Capitated payments are received. All professional services must be provided. Under managed care, Clinic-A receives payments per patient per month. Clinic-A then establishes its own contracts with specialists to provide care when required. Joe negotiates these contracts with the specialists himself. A fee schedule is used, a list put out by HMO-1, covering any medical treatments that are "usual, customary and reasonable". Occasionally a lower contract can be negotiated. Clinic-A can get a history from HMO-1 on their own historical costs. A check is received February 1 for January services.

Clinic-A is responsible for the continuum of care. The specialists must provide proof that they are covered by malpractice insurance. Specialists are contracted with individually. For instance, at Hospital-1 Clinic-A has contracts with only 8 of 13 cardiologists.

An encounter form is used for each patient visits. The patient goes to the cashier after being seen to pay the co-payment. Encounter forms are each processed. Clinic-A can tell who has spent how much, when. For example, a patient comes in with a pain in the arm. A chest x-ray is ordered, and a heart problem detected. The PCP must then fill out a referral form. The patient MUST see the specialist to whom they are referred if they are under the HMO umbrella. FFS patients can choose whom they want to see. The patient sees the specialist. The specialist then bills Clinic-A, based on a negotiated fee schedule. Referrals are extremely specific, stating exactly what services should be provided. The specialist must call the PCP to get permission to perform any other services not initially outlined.

A surgery referral often includes a pre-op and follow up visit with the surgeon in addition to the actual procedure itself. There are some "global surgical fees", as dictated by the insurers. Some surgeons do try to bill through unbundling, a discouraged practice. After surgery, if the patient requires physical or occupational therapy, a referral must be written. Usually 5 visits will be allowed. This is also true for any mental health services.

There is a hotline number, which patients are to call whenever possible. If they choose to go to another emergency medical center, it is possible the claims would be denied. This would happened if it is determined that the services could have been provided at Clinic-A. This is understood as a part of the HMO-1 subscriber agreement. This can cause problems, in that the uneducated person might have his or her own threshold of "life threatening illness".

Clinic-A is at risk in the capitated arrangements. For example, Bone marrow transplants are considered experimental, and not covered by the HMO arrangements. This is also true for chiropractic, massage or holistic services sought by the patient.
The more frequently a patient comes in, the more it costs Clinic-A. The member dollars per month are received regardless of whether the patient actually comes in or not. "Re-insurance" means that once a patient has reached $15,000 in charges in the course of a year, HMO-1 will pick up any further costs themselves. In the population of 15,200 HMO-1 members, 25-30 will go over this threshold in a year. (Cancer, aids, open heart surgery).

Each floor has two nurses who do nothing more than triage. They answer calls, advising patients and making next step recommendations. This is a screening process to insure that patients really do need to be seen prior to arrival. The triage nurses have become "the grandmothers and aunts" of the population: there is no one else the patients can call to ask non-critical questions, such as how to nurse a baby, etc. The nurse will document all phone calls, call for the medical record, and make sure the PCP is aware of the interaction. Nurses will err on the side of the patient if there is a question. This is based on clinical judgment and the threat of malpractice.

Protocols are created at Clinic-A by the doctors themselves. Insurers offer guidelines themselves as well. Clinic-A looks at "what is normal in the area" in establishing internal guidelines. The same protocols are used regardless of the insurer.

Providers more or less put the patient first, though they are aware that costs are a key concern. "Physician extenders" are being used more frequently, such as Physician assistants, and non-opthamologists. This reduces overhead without jeopardizing patient care.

Fee schedules are examined frequently. HMO-1 releases a quarterly report, with weighted averages and comparative data. These schedules and CPT codes are the basis for charges.

Clinic-A holds open houses for new patients. Of the 300 invited, 3 might show up.

There is a need for a way to measure quality. It is difficult for non clinicians to measure clinical quality. How to judge is an issue. There are also concerns that bedside manner can be more important than actually clinical care, and perhaps that concern falls through the managed care cracks.

**Interviewee:** Chief Executive Officer, "Joe"
**Location:** Outpatient Medical Clinic-A
**Date:** 10 February 1995

Two types of health organizations are interesting:
HMO - Health Maintenance Organization: must contract with providers. Patients must use providers HMO designates. If they use another provider, there is no coverage.
PPO - Preferred Provider Network: insurance company designates a provider - a preferred provider. If the patient uses the preferred provider, the insurance company pays for it. If the patient goes somewhere else, the insurance company covers less.

This is the way the payment cycle works. The employer pays for the insurance for their employees. The employer contracts with an HMO for medical services. Actuarials are computed for the group to assess risk and premiums. Employees have the opportunity to choose from several HMOs from their employer. The employee then picks the HMO of his/her choice. The employee then chooses a physician that accepts that HMO coverage. The employee, in effect, is choosing Clinic-A and a physician. Clinic-A contracts with the HMO to provide professional services according to a capitation fee/enrolled patient/month. Any expenses above the capitation fee, Clinic-A must pay.

Clinic-A will use standards on costs to price work. They typically use the fee schedules provided by the issuing hospitals for patient services. There are two types of costs: direct medical costs and support costs.

The patient will come in to see the primary physician. They will use an encounter form to document the visit and recommend further medical work. Physician diagnosis the patient at Clinic-A, takes x-rays, and then recommends a specialist at Hospital-1 through a referral form. Through the referral form, Clinic-A determines who the specialist will be.

Hospital-1 bills Clinic-A for services rendered. Any procedures, in addition to those specified on the referral form, must be cleared through the Clinic-A physician. The primary care physician manages the care.

Global billing is used often to bill instead of traditional unbundled, itemized billing. There is a reinsurance program. Under this program, if any patient procedure goes above $15,000, the HMO will pay for the difference in the service costs. (Typical Clinic-A patient population: 15,200 members. Number of patients that exceed $15,000 in costs annually: 25.)

Nurses do triage telephone calls checking to make sure that the patients need to come in. Protocols exist for diagnosis & treatment and are used regardless of insurance companies. Medical protocols are developed with the patient’s care in mind first. Nurses are usually fairly defensive, opting for conservative recommendations. Documentation is lengthy and time consuming. Physicians may use nurse extenders. Like the ophthalmologist who looks at the patient at the end of the visit.

Clinic-A is responsible for the continuum of care. They serve as the gatekeeper and contract with specific specialists in the Hospitals for service. There has yet to be developed a real measure of quality. Non-clinicians cannot judge quality.
Interviewee: Chief Executive Officer, "Joe"
Director of Finance, "John"

Location: Outpatient Medical Clinic-A

Date: 16 February 1995

We will need to adjust our plan of attack as far as getting information is concerned. We will not have access as we had hoped to any patient specific information, due to issues of patient confidentiality. John suggested we focus on a particular DRG, and thus might have some billing information from which we could gather information.

We should be certain to include interviews with specialists, hospitals, and insurers in our research. Joe recommended the HMO-1 medical director, and a managed care innovator. In addition, the director of nursing responsible for protocols would be a good contact.

Clinic-A has 17 doctors, 14 of whom are stockholders, 3 not. These 3 have a set salary with a contract of 12-18 months. The stockholders are paid according to the following algorithm: 85% production (transparent to the doctors themselves, measured by Clinic-A fee schedules), 10% intangibles (talks, administrative value), 5% seniority within the group.

The only difference between HMO and FFS patients in that FFS patients can go wherever they want. HMO patients are referred to either Hospital-1 or Hospital-2 for major procedures. Many of the HMO breast cancer patients for instance would prefer to be seen at the Hospital-3 (reputation) but are not able to due to the arrangements mentioned above.

There are no clinical differences in the direction the care will take. There is no change in quality. From a business point of view however the differences are enormous. Under managed care, Clinic-A can negotiate contracts, and payment schedules, utilizing bulk fees. Non managed care leaves Clinic-A with virtually no say in what charges will be issued. Non managed care results in more fragmented care, and deteriorates without some sort of a gatekeeper.

Clinic-A saw 70,000 patients last year, 15,000 of whom were HMO-1 (20%). These patients account for 50% of the visits to Clinic-A. HMO-1 focuses on preventative medicine, encouraging the patients to come in for "every little thing". In addition, employees are increasingly paying more of their health insurance themselves, and want to get their moneys worth. There appears to be an "entitlement" attitude, and a misconception about what preventative medicine really is. The desire is actually to have patients come in for screening regularly. Patients are seen by the doctors at Clinic-A. The major expense incurred by Clinic-A are referral expenses. They would prefer to stop the illness before the patients are truly ill. When someone gets laid off, they tend to continue to come to Clinic-A but only in order to receive treatment for their children.
Clinic-A is paid on a modified fee for service arrangement. Referral tracking and patient management are almost identical tasks. Under managed care, organizations will try to do as much of the treatment as they can in house. There are some indemnity patients, who want to see a specialist even though the doctor doesn't feel it is necessary: this doesn't "make cents or sense". Actual treatment and care of the patients does not actually change. Clinic-A can insist that care be done on site for HMO patients, whereas other patients can go elsewhere.

Over medication is one of the #1 problems in non managed cases. When management of care is not coordinated, there are problems with pharmacological interactions that harm patients.

Studies show that preventative medicine is saving lives. The concept of HMO's has been around since WWII. Currently more and more things are being done at home, out of the hospital. Sub acute nursing homes centers are being created, that are treating 30 year olds with (for example) knee replacements.

There are 50% too many hospital beds in the greater Boston area. Many of the services and treatments could be conducted at centers like Clinic-A. For example, pacemaker insertion: Hospital-1 charges Clinic-A $590 facility fees. Doctors at Clinic-A can perform the procedure in their offices now for $150 base fees. They assume the liability and are allowed only to use general anesthesia. Many more procedures than are currently being performed in house could be. The procedures that will never be able to be brought inside are life threatening emergencies and planned complex surgeries.

Mental health coordinators sit down and talk to the patients, assess the level and type of services required and approve a limited amount of treatment. Psychiatrists tend towards long term care rather than short term, and medications where perhaps they are not required.

Clinic-A does not have a computerized medical record. It is seen "down the road". Hospital-1 already has at least some components of a record on line.

"We are proud of the quality of care and the innovations we have". For instance, Clinic-A negotiates with surgeons on in office surgeries vs. in hospital procedures. For example, Dialysis: OUTPATIENT MEDICAL or in house? At home it is much less expensive and more efficient. The centers can become constant reminders of the patients condition, but at the same time can offer patients contact with others with similar conditions. At home, the machine can be a constant reminder itself, and there is a great deal of responsibility involved in monitoring both patient condition and hardware.

**Interviewee:** Primary Care Physician, "Tom"  
**Location:** Outpatient Medical Clinic Clinic-A
Tom is a primary-care/internist at Clinic-A. He described the breast cancer treatment process:
There are virtually no preventative measures available to combat breast cancer. Medical literature and experts believe that diet may help, but he wasn’t convinced that it does. He also said that preventative mastectomies are done in high risk patients.

There are 3 detection methods:
1) The patient finds a lump or abnormality during a breast self examination (BSE)
2) The primary care physician (PCP) finds the abnormality during a routine exam
3) A radiologist finds the abnormality
The timing between detection and treatment is important. The shorter the time frame, the better the chances are for survival. Many patients who self diagnose are slow to report it to their doctor because they are afraid of the outcome. That fear causes delay in treatment.

Once the PCP discovers the abnormality (which we will assume is a lump), the patient is scheduled for a mammography in the same day if possible. The timing is not as critical pathologically as it is psychologically for the patient. Making the patient wait makes the patient endure unneeded stress.

The radiologist then performs the mammography. If the mammography shows a tumor, the patient is scheduled for an appointment with a surgeon to biopsy the tumor. The biopsy is performed at Hospital-1. Once the biopsy is completed, the specimen is examined by the pathologist to determine whether or not it is malignant.

If the tumor is malignant, the PCP, the surgeon, the oncologist, and the patient discuss treatment options. Once an option is chosen, the patient’s case is presented to a cancer review panel. This panel is made up of professionals from the Boston community who review the case, providing a second opinion and certifying the prognosis. The oncologist and the radiation therapist may sit in on the panel to argue the original prognosis if necessary.

Once approved for treatment, the patient undergoes a combination of surgery, radiation treatment and/or chemotherapy. The radiation therapy is performed at facilities outside Hospital-1.

Follow-up exams are scheduled as needed with the radiation therapist, the oncologist, the plastic surgeon, and the PCP. Specialists typically attempt to influence the PCP to approve follow up treatment. The risk of over-examination is most pervasive here partly because specialist’s incentives of more work, more business does not correlate to the PCP’s attempts to manage the patient’s care and health costs to the practice. PCPs can prevent specialists from over-treating patients because they select the specialists as part of
the HMO plan. If threatened from specialist groups, Clinic-A can work around specialists or deny them access to patients.

He sees differences in different payment schemes:

*Fee for Service*
  - No incentive for innovation.
  - Referral process is at the discretion of the patient—they decide where they want to go.
  - Better patient satisfaction.

*Health Maintenance Organization*
  - More incentives to innovate and streamline medical care delivery.
  - Referral process is in the hands of the PCP and the HMO.
  - Lower medical care costs.

Clinic-A audits their charts to see if PCPs are asking patients if they are doing their BSEs. It is part of Tom's responsibilities and helps promote early detection.

Other recuperation sources are support groups and physical therapy. These are recuperative activities.

There are incentives for getting the diagnosis right the first time:
  - the sicker the patient is, the more it costs to treat them.
  - records are audited continuously by the HMOs.
  - the high litigation/lawsuit costs make it more attractive to get it right.
  - patients may accuse the PCP or others of skimping on care to keep costs down.

Tom wears many hats: medical doctor, manager of other MDs, manager of a small business.

The move to network services may be an attempt on the part of organizations to: “be as big a fish as possible to swallow up the other fish before they are swallowed themselves!”

Treatment guidelines are helpful. They use many different sources for guidelines including the HMO-1. However, it does provide one more way for patients to sue physicians. Clinic-A makes a conscious choice which guidelines to follow and which to ignore.

HMO Blue looked at approximately 6 different organizations for appropriate guidelines and then consolidated a list of guidelines based on the processes that prescribed the fewest procedures. He thinks the rational was a bit questionable.

IT is needed to flag when something in the complicated chain of health care delivery doesn’t happen.
MDs are resistant to accepting the inevitable responsibility for a patient's behavior. This is an extra responsibility of making sure the patient shows up for specialists consultations, takes prescribed medications, etceteras.

Nursing homes are moving to sub-acute care facilities because the cost of treatment is cheaper. Overhead can be as much as 4 times cheaper ($250 compared to $1,000).

Innovative activities include:
- Quality Assurance - using the hospital's billing database to track diagnoses. Diagnoses are checked for those that were changed and those that had follow-up diagnoses that differed from the original diagnosis.
- Sub-acute care in nursing homes.
- Computerized link-ups allowing two physicians to consult over a multimedia line---telemedicine.

Primary care does the management of care. That is a good thing. He believes physicians must continue to be part of the management of the practice as well a the deliverers of health care.

**Interview:** Director of Finance, "John"  
**Location:** Outpatient Medical Clinic-A  
**Date:** 3 March 1995

The Primary Care Physician (PCP) refers patients to specialists. If there is a clinical reason to do something, it is done without regard to financial issues. There is a referrals department that sends out all referrals, gets the necessary authorizations, essentially says it is OK to treat the patient. The PCPs will do whatever is clinically necessary, regardless of financial class. Claims are submitted, sent to finance, where claims are matched against written referrals and authorizations.

Claims are entered into a computer. There is information for each payer regarding how quickly each party is obliged to settle the claims. Once a week, a selection register is run, pulling out any bills due the following week. These are all reviewed by the claims manager. The list is either edited or approved in its entirety. Checks are cut to the payers where appropriate. The claims manager checks the "bottom line", and the adherence to contracts.

Temporary authorizations are also sometimes issued by the payers. These also get entered into the computer. The claim is not actually authorized. It is returned to the PCP, the chart is ordered with all of the patient notes. The PCP says yes or no. Claims are rejected if the procedure could have been done at Clinic-A, or not at all. (These are services for which Clinic-A is billed by the specialists with whom they have contracted out.) The contracts between Clinic-A and the specialists all include clauses regarding "unauthorized services". Patients can not be billed twice for the same service.
There are also "global fees", cases paid at the end with a global fee. For example, during the course of a pregnancy, how care is provided from the first doctor visit through to birth. The OB doctor gets no money from Clinic-A until the birth of the baby has occurred. The global fee includes follow visits where necessary as well.

Patients who need to see an oncologist are all referred out. These contracts are not set prices, as each case is so different. Mammographies and biopsies are done under global fees structures.

The insurance companies have people reviewing Clinic-A periodically for compliance. HMO-1 is capitated, HMO-2 is managed care but not capitated, others make fee payment/charge suggestions. Billing is based on CPT codes. Some codes are "bundled", encompassing several different procedures. One of the historic abuses in the system has come from trying to unbundle related charges. Utilization reports are run, and management queries are done on the claims database.

Each insurance company has its own fee schedule. Clinic-A tries to get specialist to agree to third party fee schedule. "why reinvent the wheel." Current contracts are both higher and lower than the suggested fee schedules. Most contracts are for two years, though some are for one, some are rolling.

Under sub capitation Clinic-A could tell specialists not to see patients from anywhere other than Clinic-A. In exchange, we will send you 100% of our business. Clinic-A can not contract with a group of specialists if they are not already an official business group. (Anti trust laws)

There may be more expenses up front now than there used to be, but this is in the hopes of saving money in the long term. Clinic-A has a membership base, of which only x% actually become patients. Clinic-A relies on this fact. There are patients who never come in, who receive routine care, or who need to be seen by specialists. There is no magical break even point, but in the aggregate Clinic-A needs to make money. "Our profit as an industry relies on the outcome of what we predict will happen given a particular population."

Specialists are coordinated through pre-managed care. There is some collaboration between PCP and specialist but records and control remain with the PCP. Managed care actually provides the PCP with a more complete medical record.

What's wrong? There is an inherent flaw in managed care. It is known, but ignored. The better you manage care, and the more money you make, the lower your reimbursements will be for the next year. PCPs are creating a more efficient atmosphere and delivery system. There is market pressure to bring costs down as well. But they are penalized for saving money.

Capitation is negotiated. HMO-1 wants to pay monthly membership fees, $70 per member per month. This is based on actuarial tables, the population, etc. Clinical costs
per patient per month are usually $30, administrative $5, specialists $30, substance abuse, $5, etceteras; the profit being approximately $1 per patient. Clinic-A can not ask HMO-I what they are paying another clinic for instance. Perhaps that clinic charges more because they do not do things as well or efficiently as Clinic-A., and receives $90 per patient per month.

Other insurance companies want to lower the costs they are paying Clinic-A because the costs are so low. Clinic-A would like to be, needs to be paid the going rate. "What is reasonable and just compensation?" The incentives are off. Population size compensation is also not paid enough attention to.

Interviewee: Director of Nursing, "Jane"
Nurse Manager, "Susan"
Location: Outpatient Medical Clinic-A
Date: 9 March 1995

Protocols
There are no written protocols used by the triage nurses at Clinic-A. There are however protocols used by the physicians themselves.

Triage Nurses
Triage nurses are hired to be just that. They are required to spend some time on the floors to keep their skills updated. They rotate through on a regular basis. The work is not as stressful as work would be at a hospital. They are not paid as much, but it is considered to be a more secure job. They work closely with the physicians, and keep their practice skills updated.

Medical assistants (MA) are also used. At Clinic-B, they actually perform much of the work Jane feels nurses should be doing. At Clinic-A MAs do a little bit of the work, such as taking blood pressure, weights, etc.

95% of all patients enter Clinic-A through the triage nurses. The nurses have a Kardex file, and a three ring binder used to walk patients through the phone calls received. Both are updated internally, by Jane and co., including input from the physicians. Some institutions have actual decision trees that are used, but Clinic-A does not use this methodology. There are some written guidelines in place, written by Jane, but for the most part the nurses know what questions to ask and what the next steps should be based on professional training, and learning from each other.

The nurses use a message book (multiple copy) to record each and every call. Patient name, birthday, primary doctor, problem and disposition. Any advice given is recorded. A copy of the message goes to the PCP, who must sign off on it before it can be placed in the medical record.
The nurse then transfers the patient, if required, to the appointments line. The nurse tells the appointment person when the patient needs to be seen (e.g. today, within a week, etceteras) and by whom (PCP, nurse, medical assistant). Some patients will refuse to make appointments. If this occurs, the receptionist notifies the nurse, who documents the incident and alerts the PCP.

If a patient calls into triage having discovered a lump in her breast, an appointment is immediately set up, there is no second guessing done. Where possible, an appointment will be made with the PCP, although the patient may be seen by urgent care is needed.

If there are insurance specific questions, the patient is referred to a "patient advocate". There is one on each floor for HMO-1, others to handle other insurers. These advocates act as clearing houses for the patients, getting them answers regarding insurance related issues without the patients having to call the insurer directly. It helps keep the patients "not anxious".

**Mammography**
They need a better PCP tickler system, and are in the process of trying to put one on the computer system. The ideal system will have a reminder letter sent to patients who have not had mammography reports sent back to Clinic-A within 2 months that would be automatically printed. The PCPs check each letter before it is sent out, and will when necessary call the patients directly to checkup on the case.

Clinic-A does not perform mammographies on site. Most patients are referred to Hospital-1, though FFS patients may choose to go elsewhere. For those patients examined at Hospital-1, there can be lengthy delays in getting back the results, as long as 6 weeks. These are of course the non positive results.

One major issue of concern is not having access to previous mammograms. Ideally previous mammograms would be available for comparison purposes. Many patients change location or insurer frequently, and thus do not have mammograms performed at the same location each time. Most patients do not bring the actual images with them when they transfer into Clinic-A care. In order to get the images, the patient has to sign consent forms, and the records must be sent to Clinic-A. This can be lengthy, if it happens at all. This frequent changing of insurers seems to be happening more and more frequently, and this lack of comparative images is becoming more of an issue. Patients need to have confidence in the performing facility.

Another issue that arises is the difference between how frequently a mammography is recommended and what the insurance company will pay for. Nurses do not take responsibility for recommending a mammography be done, PCPs do. Even then, they can not insist but only recommend it be completed.

**New Patients**
All new patients (HMO) to Clinic-A are required to receive a physical. During this visit, the PCP will ask the patient about their mammography, breast cancer, and self-examination histories and practices. Each new patient is required to sign on to a particular PCP, though they are not then necessarily required to use them.

**The Process**
The patient is seen by the PCP. If necessary, they are then referred to a specialist. Most patients are not immediately referred out, though there are exceptions to that rule.

Once seen by the specialist, the patient might call back in to the triage desk for advice, reassurances etceteras, (Am I doing the right thing? Should I see my doctor?) Again, all of these calls are recorded and become a part of the medical record.

Occasionally pre-op work will be conducted at Clinic-A, though it is usually done at the specialists office. Most patients receive one post-op visit with the surgeon, though additional visits may be requested.

Post-op work done at Clinic-A includes irrigations, dressing changes, packing and IV therapy. These procedures are done primarily for HMO patients, FFS patients continuing their care with the surgeon.

One thing that is considered important at Clinic-A is continuity of care. If a patient is either coming in on a weekend, or being seen by someone other than their PCP, the nurse in charge of that visit will make contact with the nurse/provider usually seen, and take responsibility for knowing exactly what is going on, needs to happen to the patient. This helps keep costs down, as only necessary procedures are conducted.

Hospital-1 is relied upon for some of the patient related in-services, such as a porto cath placement. This is a specific, highly technical procedure. Hospital-1 held an in-service to train Clinic-A nurses how to perform the procedure on site. Another example where another institution is involved in patient care involves the Visiting Nurse Association, VNA. When a patient has a central line, and is currently seen at home, but for whatever reason will now be seen at Clinic-A, the VNA nurses will come with the patient for the first few visits. The Clinic-A nurse will perform the procedure, with guidance from the VNA nurse. This insures that there is continuity of care for the patient, and aids in making the patient comfortable with the transition.

**HMO Effects**
The patient management that occurs under the HMO umbrella tends to result in less tests being performed, repeat or unnecessary procedures being done. As clinics such as Clinic-A turn change their practices to accommodate the demands of the HMOs, changes are also seen in the care of other patients, a carry over effect to FFS patients and their care.

HMOs are very concerned about costs. There are financial incentives to bring procedures in house. An example of the high cost of home care: it costs $250-$300 a day for I.V. therapy to be given in the home. Many FFS patients do not have insurance that covers
home care, so it is done at Clinic-A. For HMO patients, it is a decision made by the patient advocate, who is called in upon the request of either the PCP or the patient. Home care is more expensive.

No clinical decisions are made based upon a patient's insurance status or insurer.

**Outcomes**
The lab manager is very concerned with quality control. Test results and trends among patients are routinely scrutinized. For example, "quickie screens" are routinely used on urinalysis tests using dipsticks, which must be read at exactly 66 and 120 seconds. The reader can easily get distracted at the EXACT second the reading is required, and the results are thus less than reliable. "Quality issue." The lab manager had been monitoring the situation and recently purchased a machine that accurately reads the dipsticks at the appropriate times.

Many changes in medical practices are made based on intuition. No specific outcome studies are conducted at Clinic-A. But doctors and nurses confer on a regular basis and appropriate practice changes made accordingly.

Clinic-A must submit information every year to the Massachusetts Professional Insurers Association with result and patient information.

Due to the medical management practices, and the use of triage nurses, the rate of visits is kept low at Clinic-A.

**Miscellaneous**
There is a pediatrician and an internist on call every day, on site, with no scheduled appointments. They handle all urgent care appointments. The providers rotate this service.

Each PCP has an hour of "call time" during the day, when patients can call in and talk to them directly. This information is given out to patients throughout the day. "Dr. Doe's call time is 12-1, please call back then." If this recommendation is given, the nurse will see that the MR is pulled prior to the time frame and alert the PCP as to why the patient is calling.

Appointments can be made for a physician or a nurse. A nurse can "drag a doctor in when needed."

Negative documentation is not routinely written. (E.G. The following tests were not performed because...)

Hospital-1 is computerized, Clinic-A is not (with the exception of some lab results.). Clinic-A personnel have direct access to the Hospital-1 information.
Interviewee: Primary Care Physician, "Joe"
Location: Outpatient Medical Clinic-B
Date: 9 March 1995

Joe suggests that we contact someone in "non group" practice at Hospital-1. He believes major differences would be seen throughout our project if we investigated both solo and group practitioners. Groups have a more integrative capability, offer more points of contact for the patients.

Clinic-B has relationships with individual businesses, companies, and partners. Each provider and payer in contact with Clinic-B has a contractual relationship with Clinic-B. HMO-1 has an exclusive arrangement with Clinic-B, and accounts for 50% of the patients seen. (Exclusive meaning Clinic-B may not have any other HMOs with whom it works.) It is the responsibility of Clinic-B to provide all primary care and professional services, including OUTPATIENT MEDICAL consults and procedures and inpatient consults. They are not required to provide inpatient procedures.

Many of the OUTPATIENT MEDICAL procedures are contracted out, often to Hospital-1. A daily fee is negotiated annually with Hospital-1 for the use of the facilities. Many of the specialists used operate under strict contract payments or sub-capitation. HMO-1 has a recommended fee schedule for these PCP-specialist contracts but each clinic/organization may establish its own contract rates with each provider or institution. If a specialist does not want to work within the contract limitations proposed by Clinic-B, Clinic-B will simply stop sending patients their direction. These contracts are usually established by Joe (managing partner), the CEO and the Clinic-B managed care director. Clinic-B has some leverage, and can insist on compliant behavior.

Clinic-B has 20 providers including pediatricians. 11 of these are Clinic-B partners, 9 associates. They operate out of 4 sites.

The Process
The patient is seen by PCP, when possible. Many providers have completely full schedules and are hard to get time to see. It is considered important with all patients, but particularly for those with suspected lumps, to respond to the patient as soon as possible, psychology playing a huge role in the treatment and approach. If the PCP is busy, the patient will be seen by another doctor, a nurse, or a physicians assistant. The patient makes the choice of whether to wait for their own PCP to have time, or see someone immediately. Usually the patient chooses to come in sooner rather than later. There is an assumption within Clinic-B that there will be full communication back to the PCP.

If the patient feels she needs to speak directly with her PCP, a time is set up, the chart called for, and the call completed.

Clinic-B has its own mammogram facilities at one location. HMO patients are required to use this facility (though there is "always an exception to be granted". If "medically justifiable" anything can go outside of HMO rules.) Most FFS patients choose to be seen
at the main site as well, though they can go anywhere. Joe has not noticed any issues regarding report return time lags.

On the bill for each visit, the doctor checks what tests were recommended. This in turn generates a corresponding report form, indicating that Clinic-B is awaiting the results of the test. The file goes into a "pending file" until the actual hard copy of the report is received. At this point the hard copy goes into the in box of the PCP. One (small) timing hang up could be the time a report remains in the pending file waiting for a secretary to complete the process. The pending file is checked regularly. If a report has been outstanding for 2 months, a call will be made to the patient to see if the patient chose not to have the mammogram done. Occasionally, but rarely, the report has gotten "lost in the system"

Clinic-B has only a 5% turnover rate so the problem mentioned at Clinic-A does not hold true. If a patient transfers locations/insurers/providers, they have to request that any old records be sent to the new site. They usually do not request images, but rather only written reports. So for these transferred patients, there may not be an old mammogram with which to compare the new. Joe raises the question however of does this really make a clinical difference? In the long term care of a patient, if something is missed due to not having an old film, will it matter if a patient waits a year or two to have 2 images to compare?

There is a lump. Clinic-B sends the patient to a surgeon, with mammogram in hand. The surgeon recommends what step should be next. For HMO patients this is called a restrictive referral, as only the diagnostic visit is approved.

After a lump is detected, it will usually be aspirated, to determine malignancy. Many cysts are actually benign. Note: At Hospital-1, "interventional radiologists" are trained to perform and read the mammogram, and immediately do the aspiration, a more efficient mechanism than requiring two separate steps and visits as is now required. It could be done in just one step, more efficiently and a cost savings. The debate has been opened within Clinic-B which would be a better model, the decision likely being business driven. (i.e. does Clinic-B want to lose the revenue it currently receives for performing mammograms?)

PCPs are informed of all admissions to the hospital. The admissions often phoned into the office. The agreement with HMO-1 includes guaranteed paperwork about all patients. Pre-op work is done at Clinic-B for the most part. It is the PCPs personal choice whether or not to visit the patient in the hospital, with the exception of complex cases with additional co-managed problems. The PCP receives all operating room summaries, pathology reports, etc.

The tumor board at Hospital-1 looks at all patients cases and makes a recommendation about treatment plans. The surgeon normally is sitting on the tumor board as decisions for his or her patients are made. The surgeon then has the responsibility of implementing
the treatment plan, or referring the patient to someone else for a second opinion. The PCP is nominally responsible for post-op care. One gap: It is unclear whose responsibility it is to make certain the patient hears and understands all of the options available.

After the treatment plan has been determined, the PCP and the surgeon take joint responsibility for getting the recommended referrals arranged. With HMO patients, it is expected the PCP will have a role in the care of the patient, where as for FFS patients this is not true. FFS patients usually have all follow up care done outside of Clinic-B, with most of the responsibility falling directly on the surgeon.

**Protocols**
There are treatment guidelines released by HMO-1. These guidelines are considered to be non restrictive, recommendations. These standards do contribute to changes in clinical practices. Clinic-B does not want to have 2 different sets of patient treatment and practice standards, so the processes established for HMO-1 patients tend to carryover and be utilized on all patients. This may result in patients who are in a position to choose not hearing all of the options. (patient autonomy related)

The incentives under capitation are to minimalize, and this carries over to the FFS patients as well, with a current prejudice against marginal medical procedures. Joe would like to think that the guidelines released by HMO-1 are outcomes related.

**Miscellaneous**
Most patients are seen at the same center all the time, so their charts remain at the single location. If needed, courier services are used to deliver charts between the 4 locations. There is often a problem locating charts.

Clinic-B has a minimal computer system. Appointments are live, they are "going to get" lab results on line. They are moving in concept to an on-line medical record, but that is "5 years away".

HMO-1 provides incentives for performance of mammograms. There is a way to earn bonus money on top of capitation contracts. There is a list of screening tests, for which if Clinic-B performs them on 90% of all eligible patients, Clinic-B will receive the bonus.

HMO-1 audits the performance of Clinic-B. They track members, distribute and collect member satisfaction surveys, and audit records. This allows them to keep track of Clinic-B specific practice norms and standards.

The largest difference in HMO vs. FFS patient care at this point involves large cases. If a patient is quite sick (e.g. patient is disfigured, needs home care, etc.) the management of the case can be complex. A "nurse case manager" who works at Clinic-B but is funded by the HMO, is put in charge of the case and coordinates all of the appointments, transportation, etc. It is a cost cutting device the integrates the care of patients across
providers. The nurse case manager make sure insurers are all meeting common objectives, and that no more or less than the treatment plan is being conducted. For FFS patients, a social worked at Hospital-1 can be called in to do some of the coordinating and case management, but most FFS insurers pay for limited visits with these social workers, and the patient is eventually left to manage their own care.

**Interview:** Primary Care Physician, "Joe"

**Location:** Hospital-1

**Date:** 11 March 1995

Joe is a primary care physician at Hospital-1, a general internist. It is his opinion that the health care industry today is a "very fertile ground waiting to be mined." Joe has lost hundreds of patients himself. (He is not a member of a group and does not see HMO patients.) He has had to advertise in the paper. If the current trends continue, there is a distinct possibility of extinction. The current system is irrational and unstable. Things will change within a year or two. The only way to survive is with a niche practice.

As an example of some of the current issues, Joe provided the following example. (NOT a real patient case.) A 46 year old woman has breast cancer. The lump was found during a routine mammogram. she had a lumpectomy, and was recommended for post-op radiation. The question: Her nodes are negative. Should chemotherapy be entertained as a treatment solution? The case is presented at the tumor board, where the consulting oncologist recommends the patient receive chemotherapy. It is recognized that the patient is at high risk, and 5% of such patients will benefit from the additional chemotherapy. The patient is referred to an oncologist at Hospital-1 to receive the chemotherapy. This should be a joint decision, with the patient involved. There is only a 5% chance that patient will receive additional benefit from this treatment.

Morale: The patient is at the margin. The patient "might" see a difference. Obviously there is a cost difference. The clear benefit is at the medical margin. Joe sees there being a lot of issues arising from such cases.

On principle Joe does not like the whole approach of discounted fees. It is flawed. The system should be payer driven. Right now employers are in the drivers seat. They want to call the shots and reduce costs: you can't blame them. Historically the system was set up like this arbitrarily. In the WWII price and labor contracts, health care coverage was provided as a means for employers to compete for employees. Now the whole system has gotten too expensive. To address this problem, employers need to control costs.

What is it about health insurers that is so different that patients shouldn't be able to choose for themselves, as they do with house and car insurance? It is an anomalous situation from the market point of view. It all goes back to the tax codes, a break being given to the employers. Individuals can only get coverage if the employers pay and
choose the insurance companies. The solution is not a single payer driven system, like they have in Canada. "Go from the frying pan into the fire with this system."

We need to go from a payer driven to a patient driven system. We need to re-empower individuals to buy their own insurance, choose with whom they work. Give individuals the tax break directly. It is simple, and could be done by rewriting the tax code. The system would see shifts, re calibrations. HMOs will not go away.

Other insurance plans and companies would crop up if so directed by individuals. For example, catastrophic insurance plus a health care savings plan.

Practice patterns have changed over the past several years due to the evolution of sciences, not HMO practices. Quality of care issues are subtle. Joe sees hardly any healthy young people, they are being seen at the HMOs. Most of his patients have physical and/or emotional problems. When bad things happen to a loved one, a parent dies early, the patients need a lot of attention. They would have a hard time at an HMO. The relationships are simply not there. It can be hard to get in to see a specific provider, the appointment often taking months to schedule.

Interview: Director of Rehabilitation Services, "Mary"

Location: Hospital-1
Date: 12 March 1995

Very few breast cancer patients are seen any more. She is not sure why, as there used to be many more. Mary believes the surgical techniques are so much better that many more post op patients simply do not require therapy. Breast reconstruction is also occurring in the same surgical episode, doing an immediate muscle transplant after the removal of the breast. These patients have to be immobilized for a period of time, and can not begin to work on range of motion right after surgery. It would be too painful. They do see a few patients on an outpatient basis, though it is a very small percentage of the actual procedures done.

There are new related maladies presenting themselves that are currently drawing attention. Lymphodema is a problem that can develop many years later. It can cause serious problems, with support groups forming all over the country. Massage techniques are currently viewed as one of the most effective treatment methodologies. The problem is, the training takes 4 weeks of off-site training, and no one at Hospital-1 can afford to take that much time away from the institution. And it costs a lot. The result being they must continue to use known techniques, "the pump". Less than ideal.

There are differences in the way RS (rehabilitation services) must treat patients in general, different ground rules for every insurer. At the hospital where Mary previously worked, each and every patient was seen post op, while still in the hospital. The therapist
would provide any relevant recovery handouts, instruct the patients what to do at home and provide training if needed. This does not occur at Hospital-1.

The ground rules: What insurance company do you have is the first question asked of every patient. The answer dictates entirely how you are handled, how the appointment is booked. Some patients required pre-approval, some can have one visits, some multiple but limited. "We have to be psychophrenic". There are 5 main HMOs with whom they are used to dealing and have learned the "rules", with another 5 or so not seen as frequently. It "always seems a bit fuzzy".

As the insurers change their rules, Hospital-1 does not receive adequate notice. For example a changed fax number, a change in the number of visits a patient may have, etc. It appears as though the insurers are doing whatever they please, almost arbitrarily. Hospital-1 has no choice but to comply.

Patients do not know the fine print. Managed care puts impediments in the way of getting care. They make it difficult on purpose for patients to be seen, hoping that many patients simply won't bother to seek outside care. Therapists are concerned. In order to get any sort of extension of services to be covered, they must send the insurance companies confidential patient information regarding the patient's health, indicating why the patient needs more visits, how far they have progressed, etc. The companies won't pay without this information, and there are serious concerns about confidentiality issues. Even the writing style of the request can effect whether or not authorization is given.

One thing they watch out for is patients demanding and getting therapy they do not need, for example industrial accident patients.

An example of a problem with the current rules: An HMO-2 patient is in a car accident and gets whiplash. HMO-2 allows 6 visits over 60 days. If Mary sees the patient twice a week for three weeks, she could probably get an extension for additional visits approved. The response to requests usually takes 24-36 hours to receive. But, all visits MUST be completed within 60 days, no payments provided after that point. This is a problem in that many injuries take longer than 60 days to recover. In addition, "for your lifetime" this is the only time the insurers will pay for treatment for that injury/diagnosis. "You are not allowed to come back for the same diagnosis in your lifetime". So patients are out of luck if they have a chronic problem. Also, future injuries or accidents can aggravate old problems, but the treatment will not be covered. There is one exception, Medicare, which allows treatment if there is documented medical need.

Physical Therapy has been abused. Twenty years ago it could be provided only by prescription from a doctor, with specific instructions as to what services should be provided. Now it is seen as a consulting service, a series of goals and time frames. It has been seen as a dumping ground, a dead end in the treatment cycle. Previously therapists couldn't stop treating patients who had doctor prescriptions for services even when they
knew the patient no longer needed treatment. Now the therapists themselves are setting the limits, doing the policing themselves. It is still somewhat arbitrary however.

**Interviewee:** Radiologist, "Joe"
**Location:** Hospital-1
**Date:** 12 March 1995

The patient contact begins with an abnormal mammogram. There can be either a cluster of atypical calcification or a peculiar shape density in the image. The next step is to do a localized or a directed needle biopsy. This can be performed by either a radiologist or a surgeon.

In the operating room, a frozen section is sometimes performed. This provides instantaneous results. Hormonal assays sometimes require that a frozen section be performed. This allows a test to be done to see if the sample is estrogen or progesterone sensitive, which will effect future treatments. If this test is requested by the oncologist, a sample is sent out to a lab on dry ice immediately. For most patients though a frozen section is no longer done, but rather a "paraffin block" test. (Which test is performed depends entirely on who the oncologist is, an interesting fact, since most oncologists do not enter the patients life until after the biopsy results come back positive. So in reality it is the radiologist or surgeon who determines which tests are to be conducted.)

The radiologist then runs a diagnosis, based on certain criteria. (e.g. does the section go to the margin, is there a high mytopic count, is there an unusual size.) The results are sent to the surgeon, who makes the next decision. Should the lump be re-excised? Should Radio therapy be provided? The surgeon and the radiologist go before the tumor board with their results and suggested next steps. The tumor board meets weekly.

Joe never knows anything about a patients insurance status. His practice has been in no noticeable way affected by HMO’s.

Hospital-1 performed 227 mammographic biopsies last year, and increase from 18 in 1983. 26% of the 227 were positive. Mammograms are almost always done, even if there is obviously a large mass felt by the provider. It provides both a baseline, and a look at the other breast.

**Interviewee:** Principal Research Scientist, "Joe"
**Location:** MIT School of Architecture and Planning
**Date:** 13 March 1995

Joe is looking at the design of the surgical room for the 21st century. He expects that the project will lead to virtual environments for designing and using multi-media applications. Presently, much of the costs of surgery are tied up in the physical plant and
it is poorly laid out at best. His project is looking at how to better design the room and integrate the efforts of management, economic planners and health care providers.

They want to build a virtual environment to simulate a real environment. Joe wants to design a system to change behavior by showing planners the big picture. In medicine, surgery has been a symbolic center and very profitable. This is becoming very expensive for hospitals. This new tool will provide an integrated approach to keep costs low and quality high.

A barrier to acceptance of this structure include the fact that management of medicine is moving away from doctors and more toward managers. Another barrier is that capital investment will be tremendous.

Clinton looked only at an economic model and did not look closely enough at environmental quality and other factors. He opened a Pandora’s Box and did not close it, because he couldn’t.

Recommendation: Process handbook will not be read unless the handbook is a tool. It should be used for training and should be well worn. You might consider something that could be held in your hand.

Corporate membership is very influential. Getting doctors’ time is difficult and they must be compensated. Little NIH money is being put into researching how to develop guidelines and protocols, and actually conduct research. There is much confusion as to the definition of good health.

He agrees that physician’s incentives will be a key issue.

Interviewee: Surgeon, "Mary"
Location: Hospital-1
Date: 3 April 1995

Miscellaneous
She is very interested in what "the process" looks like according to our findings. Her guess is it is very different from what her perceptions are (of what happens to a patient before they actually get to her.)

Mary is in solo practice at Hospital-1. She can choose with whom she wants to contract. Many of her contracts are with organizations like HMO-2, who have a fee schedule, "take it or leave it." It is getting harder and harder for her to remain solo however. A lot of the nice things in medicine are lost in group setting though. There is no longer the concept of "my doctor", patients arrive saying their PCP is DR. X but they have never actually even met Dr. X. Continuity of care is trashed, it becomes more of a business. This is OK if there is a public re-education. Levels of expectations of patients need to be established
ahead of time. For example, telling patients they may go home the next day vs. in three days. They have to educate patients that they should no longer expect to stay in the hospital forever.

**The Process**

A patient has been told that she has a lump or needs a biopsy. It used to be the case that radiologists were not present when mammograms were taken, resulting in a several day wait for the image to be read. Now there is a radiologist in the mammography center from 9:00-4:00. The image is read immediately, and if an additional test is required, it can be conducted at with the patient still present. It prevents the patient from having to come in multiple times, and has significantly reduced patient hysteria levels.

This is true at Hospital-1. Some of the HMOs do not use the Hospital-1 facilities however, and these patients do not benefit from the above convenience. These patients hand carry their mammograms to Mary, as if the images were requested from wherever they were performed, more often than not they either did not arrive, or did not arrive in time for the patients appointment, regardless of how far in advance they were ordered.

Mary goes over the mammogram with the patient. She takes a medical history. Prior to the visit, a form is sent to the patient regarding medical history, which takes about 20 minutes to complete, and which the patients are asked to bring with them to the appointment. Mary goes over why a biopsy has been recommended, examines the patient, and goes over the procedure she recommends. The extent of the problem and the hysteria level determine when the procedure is scheduled. It is almost always within 2 weeks at Hospital-1, although Mary aims for 1 week. Only occasionally is the time frame longer. Patients get their blood work and pre-op testing done ahead of time. Mary office sets up all of the required appointments for the patients.

Frozen sections of the biopsy (see pathology interview) can be done immediately in the operating room. Mary does not usually choose to use this method however, preferring the paraffin blocks. The frozen sections tell you whether or not the patient has cancer, period. There is no information provided about the size, type etc. In addition, if a patient has micro calcifications rather than an explicit lump, there is nothing there to quick freeze. She can get the results of the tests back within 24 hours usually. Patients are told that they will hear within 48-72 working hours, and Mary aims for 48. All tests are double read. The pathologist makes the initial assessment. Then every case is reviewed in the department slide show, where all members of the pathology department are present. This occurs before the final report is issued. Mammograms are also double read. In both cases, if a question remains, the results may be read by yet a third expert.

If the results are "bad", i.e. cancer, she has usually had a feeling about it before hand. In order not to alarm the patients, she will simply tell them "why don't you come into my office in three days to discuss the results", allowing the appointment to be set up ahead of time, and eliminating the need to make a phone asking the patient to come in. She tries
not to tell people the results of a positive test over the phone, although sometimes it is unavoidable. She tries to see all patients within 24 hours of receiving the results.

A metastatic work up is completed. She and the patient talk to an oncologist and a plastic surgeon to discuss the options. Some of the older patients, or repeat procedure patients already know what they want to have done, and do not see an oncologist until after surgery. The choice is the patients. These appointments occur within 1-2 weeks. The patients proceed, get a second opinion or go elsewhere. She will get a referral where required for anyone wanting a second opinion. Patients do not get short changed because of their insurance status. She will call and argue on their behalf.

**HMO vs. FFS**
Certain HMOs are restricted. Right now most of her patients are seen at Hospital-1. There was a period of time when patients from Clinic-B had to see Oncologists at Clinic-X, due to contractual obligations. It manifests into a control issue. Mary feels she can get it done more efficiently if her office arranges all the appointments and plays coordinator. This does not effect clinical procedures.

The onset of managed care has resulted in Mary and her staff having more paper work, more phone work, more arguing. They have to get prior approval for almost everything, are frequently left on hold for long periods of time when they make the required phone calls. They are often given the wrong information over the phone. She has contracts with 65 different insurers, and each wants something different. Just keeping track of them has been more work. While no one on her staff is specifically appointed to handle all of this work, if it did not need to be done, one of them would not be required.

Many of the HMOs pay now with a global fee, covering the procedures and all of the related appointments. Traditionally Mary spends between an hour and a half and two hours with patients in conference in her office post op. She has had to cut down on the amount of time she now spends with them. "There is only so much you can do for free." The HMOs no longer pay her for this time. She is trying to ignore the financial aspects of this arrangement but is finding it harder and harder to do so. She has had to change her practices. She and a nurse now see the patient initially, then Mary leaves the room and the nurse completes the visit.

Quality of care is the same. She may not be able to keep patients in the hospital as long as she would like in all cases. In actuality, it is the doctors mental health that is suffering from the new restrictions.

She is concerned about many of the procedures previously performed in a hospital that are now being performed in clinic settings. The personnel are often not adequately trained, and do not have the resources available to them should there be a problem.

There is an inherent conflict of interest in the managed care world. Where are the $ going? There is a shift from the providers to the insurance companies and CEOs. HMOs
are given the incentive not to do things. For instance, even if permission is given for a patient to receive treatment, it is often money that the HMO will have to part with if they actually refer the patient to a specialist. If the referral is not made, more money is kept by the clinic, to be split and pocketed internally. Most people are still morale and good and will not allow this to happen, but it is real and legitimate concern.

There are some legitimate abuses of the system. There are real ways to cut costs. There are some difference in treatment based on HMO restrictions. For instance, the American Cancer Society recommends that patients between the ages of 40 and 50 have a mammogram done every 1-2 years. Most HMOs and Medicare only pay for every other year. Mary recommends to her patients in this age bracket that they have the test done every year, but many can not do to insurance. She also sees many young patients. Many HMOs will not pay for the first mammogram until 30 or 35 years of age. She feels that the first should be done for those patients whose mothers had breast cancer not later than 10 years prior to the age of mothers onset, i.e. mother is diagnosed at age 36, daughter should have mammogram at 26. HMO coverage will not permit this to be done.

There has to be a happy medium. Critical pathways are not the way to go. The emphasis now is getting people out of the hospital faster, quicker. Often this is too short, "crazy". The patients are moved into sub-acute centers. What happens to continuity of care? Who follows the patients? If another doctor takes over treatment, Mary is still indirectly held responsible for the overall outcome of the patients care, even though the patient is no longer directly under her care. The mechanisms of coordination are simply not in place. How will the patient get from one place to another? Who will take care of them once they get there? What if there is a problem? None of these questions are being addressed ahead of time. And the results are not yet in. If a patient moves to sub-acute and has to spend 2 weeks, is this really cheaper than a week in the hospital itself would have been?

With Critical Pathways, clinicians are losing say in the treatment of the patient. Mary is trying to break down the list of treatments further than is currently the case: Acute, sub-acute and home with services care. Criteria for a certain method of treatment should be different for each of these cases. Mary is currently looking at critical pathways set Hospital-1 is thinking of purchasing from a company in Texas. These companies make their recommendations based on outcomes databases.

"One starts and the ball gets rolling". If one HMO decides to change a policy or practice, others usually quickly follow suit.

It is a catch 22. Managed Care does not dictate medical care, but rather financial compensation. If an insurer recommends she send someone home early, and there is a problem later on, Mary is held liable. "You did not HAVE to send the patient home". She has had to start documenting, everything. She has to make the decision herself each time. It has effected the doctor-patient relationships, as many patients blame the providers themselves. Often a doctor now has to defend him or herself. "Why if the patient still here if they can tolerate liquids?"
Often the insurers are going off of computerized "check off lists" in order to determine what they will pay for: Does the patient have X? Is Y true? An approval is granted or not. Mary has argued with people on the phone who had absolutely no clinical background. "But you said X was true, and my list says that if X then Y."

If medical practices are going to be changed, the system to do so needs to be in place first. The facilities and trained personnel need to be in place. You can not tell doctors "no" without providing them with viable alternative and backup.

**Interviewee:** Radiologist, "Mary"

**Location:** Hospital-1

**Date:** 13 April 1995

The radiologists perform three basic functions:

* Screening: no suspected cancer, routine mammograms done every 1-2 years;
* Diagnostic/evaluative: a palpable lump or breast pain has been detected, cancer is suspected. A mammography will be performed. Occasionally an ultrasound guided biopsy will also be performed.
* Ongoing follow-up: Regular mammographies done post cancer treatment.

The Radiologists always participate in the diagnosis of the patients. Often they will even localize the cancer on the day of surgery so the mass can be removed by the surgeons. If a patient actually does have breast cancer, the radiologists are involved in "staging" (prepping) the patient, as far as imaging is concerned. If a patient is referred to her by an oncologist this is usually a full work up. If the referral comes from someone else a more limited staging is conducted.

Radiologists are always involved in the ongoing care of a patient, post cancer treatment. Mary never know what insurance company a patient has when she is treating them. If cancer is found, the patient is asked which insurance company they have, as there may be restrictions as to which surgeon Mary can send people. The PCP is always called prior to selecting a surgeon. An effort is made to let the patient know exactly what the next step is going to be before they leave the radiologists office, so there is no waiting period.

Mary can often get through to a surgeon's office more easily than the patient herself, and thus often sets up the appointment with the surgeon before the patient initially leaves her office. The facilitates continuity of care. This practice came about independent of HMO approval restrictions.

All images are read by 2 radiologists at Hospital-1. All patients are treated as though there is something wrong with their breast when they walk in the door. It is Mary's opinion that Hospital-1 has a high breast cancer rate. They look very hard, aggressive performing biopsies. There is a performance "scorecard" (computer data base based) kept and provided to every radiologist on a monthly basis. (A software engineer was hired to work with one of the radiologists to develop this database and associated programs.)
There is a basic problem with referring patients for mammographies overall. There is a basic misunderstanding of the risks and potential benefits that accrue in a patient population with regular use of mammographies. With the exception of one year, each year since 1981 Hospital-1 has seen more women in their 40's with breast cancer than any other decade. Popular press negatively drives medical care, limiting mammograms. Improvements with preventative medicine attempts are noted, but it is still not enough.

The treatments provided at Hospital-1 is good. the community is small, and the relationships between Hospital-1 and the participating clinics (such as Clinic-A) are good.

There seems to currently be some concern about patients not being seen at the tumor board. Mary heard through a surgeon on staff at Hospital-1 that one of the major HMOs was no longer going to pay for patient cases to be presented at the tumor board. The cost per case is approximately $100. This is a positive program, where controversy is encouraged, and multiple opinions solicited. All cancer patients are eligible to be presented. All the consultants are there together (radiologist, oncologists, surgeon, PCP, etc.) and patients are full represented.

**Interviewee:** Manager of Member Services, "Mary"
**Location:** Outpatient Medical Clinic-A
**Date:** 19 April 1995

Mary is the Manager of Member Services. She works only with HMO-1 patients. She is located at Clinic-A and is paid by Clinic-A as well. She is essentially a patient advocate, helping patients use managed care. She offers orientations, explains services, investigates and explains claim rejections, etc. There are 5 staff members in Member Services, "customer service". The department has been around for 7 or 8 years.

There is a member advisor on every floor of Clinic-A. They handle many of the referrals themselves, though Mary sees the overflow. A PCP sees a patient. Sometimes a referral is needed immediately and the PCP will call Mary, who will get the necessary authorizations. In less urgent cases, the PCP may write a note requesting that a referral be made, or may send the patient directly from the PCP office to the Member Services office. Yet other times a patient themselves will call from home, for instance indicating that it is time for their annual mammogram, and could Clinic-A set it up? The patient does not need to see the PCP. Mary will complete the referral request form and send it to the PCP for final signature. If the PCP denies the referral, he or she will call the patient directly to determine an appropriate care plan or alternative.

Mary determines whether or not a referral can be made. She examines the patient chart, and uses the HMO-1 benefits guidelines book to make many of the determinations. (For example, mammograms are OK annually for women ages 40-50.) If there are any questions regarding coverage, HMO-1 is called. For instance, a call was placed today to
the HMO-1 pharmacy to determine if a particular steroid for a patient would be covered. Such phone calls are made many times a day. It is still true though that for most patients, no contact with HMO-1 needs to be made. The referrals are sent to the patient, who will call the appropriate specialist (at Hospital-1) for an appointment. All referrals are entered into the HMO-1 computer.

Authorizations are done at Clinic-A, by Clinic-A. HMO-1 indicates whether or not they will pay for a particular procedure or treatment. It is still up to Clinic-A as to whether or not they will give approval. For instance, in the case mentioned above, HMO-1 indicated they would not pay for the drug in question. But a patient advocate at Clinic-A determined a way for Clinic-A to cover the costs themselves under capitation. Clinic-A knows essentially then everything that happens to the patient. It is mainly for tracking purposes, is everything approved.

There are also 5 people employed at Clinic-A to cover managed care billing. Member services is responsible for primarily referrals. They handle well over 1000 referrals a month. Under managed care "patients know that everything is taken care of." They come to Mary to see if everything has been approved, and usually never see a bill. Particularly for patients with cancer, or breast cancer, it is one less thing they need to worry about.

**Case Managers**

Case Managers are clinicians, usually RNs. They come to Clinic-A daily, following rounds at Hospital-1. A PCP can indicate that a patient needs to be "on case management". A patient can also request it, as can Mary. It is then determined whether or not case management is appropriate for this patient. Case managers handle much of the patient and family contact, and issues such as "after care". Mary provided me with the names of a couple of case managers with whom I can speak.

**Billing**

Clinic-A is paid a monthly capitated fee for each patients by HMO-1. If a patient is sent to Hospital-1 for a mammogram, Hospital-1 bills HMO-1, who cuts a check and settles the bill. This amount is then deducted from the capitated fees Clinic-A collects from HMO-1 the following month. All bills are entered into the HMO-1 computer. HMO-1 pays for all inpatient services, all else comes out of the Clinic-A capitation amounts.

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**Interviewee:** Director of Finance, "John"

**Location:** Outpatient Medical Clinic-A

**Date:** 20 April 1995

John was contacted to confirm the billing process as we understood it, and was able to map out for us the simplified version of the billing process. Clinic-A receives a monthly fee for each patient, capitated payment. Suppose the patient has a mammogram done at Hospital-1. Hospital-1 bills Clinic-A directly. Clinic-A then enters this billing information into a computer (HMO-1). HMO-1 actually cuts the check and pays
Hospital-1. The cost of all such referrals is then deducted from future capitation payments from HMO-1 to Clinic-A.

**Interviewee:** Surgeon, "John"
**Location:** Hospital-1
**Date:** April 21, 1995

John is a member of the Hospital-1 Tumor Board. The meetings are held weekly and last an hour to an hour and a half. Between three and six cases are presented at each meeting. Members are faxed a few days prior to the meetings all of the relevant patient information, so they arrive at the meetings prepared. Often they will have already discussed the case with their colleagues prior to the meeting. In this case, a note is dictated and placed in the patient chart, indicating that such discussions transpired. (Note of interest: At one point in time patients were allowed to attend the tumor board meetings. It was often difficult for them to understand all of the clinical language and to assimilate all of what they were hearing. This practice has been stopped.)

Such a board is fairly standard in health care today across the nation. The Commission on Cancer and the American College of Surgeons have standards for such boards, such as which specialties need to be represented (oncologist, radiologist, radiation therapist, and pathologist.) What makes the Hospital-1 board unique is that it includes members from outside institutions. This practice started historically, when Hospital-1 itself did not have certain specialists under its umbrella, and invited these outside representatives in order to complete the circle of expertise being drawn together.

HMO-1 is unique in submitting a charge to patients for this service. And recent rumors indicate they are considering no longer paying for this service. Are they being penny wise and pound foolish? This is consistent with much of recent practices. They look at charges, and don’t think about what they really mean, what the real repercussions of cutting costs might be. For example, look at orthopedic surgery. Dr. A charges less to do a procedure than does Dr. B. So the decision is made to use Dr. A for all of the HMO-1 patients. What they do not see is that Dr. A takes 5 times as long to perform the surgery, and since the operating room charges for patients by the minute, in even the short run, money is being lost. Charges are being examined individually, not in the aggregate.

There are many benefits to the tumor board. There is a medical-legal protection issue. Following a case presentation at the tumor board, a note is put in the patient’s file reflecting what transpired, including multiple opinions and why one was finally selected as the recommended treatment plan. The legal question “why didn’t you do this?” is answered, and the responsibility shared by a group of providers, not a single practitioner.

The board is composed of representatives from multiple specialties (radiology, oncology, surgery), as well as multiple institutions. The meetings can almost be considered working conferences. Bringing together such a wide variety of specialists is added protection for the patients. All options are considered and discussed. Throwing around ideas is the purpose of the case presentations and meetings. It is professionally beneficial
to the members. A variety of opinions are discussed for like maladies. New practices are discussed. Differences between the practices at the participating institutions are discussed. It is a great way for those involved to remain up to date on practices and treatments.

Patients appreciate the board. Where else could they get the opinions of world famous practitioners? Particularly at such a cheap rate. Expensive? To get the same number and value of opinions as are received at a typical meeting, a patient would have to go see 3-4 oncologists, several surgeons, multiple radiologists, etc. The individual fees for each of these visits would be astronomical. The participating hospitals charges Hospital-1 for the time of its participating specialists. Hospital-1 in turn must try to somehow recover these costs, and thus charges the patients. As this is considered to be a valuable service to all patients, as well as to the specialists treating them, Hospital-1 will likely continue to convene the board, even if HMOs such as HMO-1 stop payment for the service, somehow swallowing the cost themselves.

**Interviewee:** Oncologist, "Joe"

**Location:** Hospital-1

**Date:** April 24, 1995

Joe's role in the treatment of breast cancer varies widely depending on the patient. 80% of the patients he see come to him with a positive biopsy with a finding of malignancy. Others come on their own volition with a breast lesion, and don't feel the normal treatment cycle (primary care physician [PCP] to radiologist, etc.) is adequate. A third type of patient seen are indigent patients. The Department of Public Health and the Center for Disease control have given a huge grant to Hospital-3, where Joe practices part time. Indigent women can receive free mammograms, and he will see them if it is then felt that an evaluation is required, or a question needs to be answered.

The medical oncologist tried to help the patient determine the primary intervention. The PCP contacts the oncologist right away when a positive biopsy is received. This contact is almost always made by the PCP. There is a huge patient anxiety level, and there is the desire to thing rolling and completed as soon as possible.

Joe performs a formal consult, which is generally booked for an hour. It usually lasts more than an hour. There is an amazing amount of information being thrown at the patients all at once, and a lot of questions arise. Unless they have been to a surgeon who is knowledgeable about the process, this initial consult is often the first time the patient hears the options and alternatives. A physical exam follows the verbal descriptions. Often, discussing a single “loaded” issue takes up the entire visit, and the patients has to come back for a second visit to perform the physical exam.

The younger and more aware the patient, the more intensive is Joe’s approach. For instance, for some he will actually draw cancer cells for them, explaining graphically
what is happening. He will describe exactly where the cells are in which stage of the cancer process, and where the patients cells themselves are.

At the end of this visit a recommendation is made. The hope is that the patients walk out with an understanding of the process, and have a solid recommendation from him as to what the best recommendation would be, or that the patient should get a second opinion. The visits are primarily for presenting information. These are stressful encounters, as people are hearing things they do not want to hear. It takes a great deal of energy and effort for all involved.

At Hospital-3 hospital it is the oncologist who decides on the course of treatment, whereas at Hospital-1 it is the surgeons. The Tumor Board is viewed as important component of the decision process. It is a consensus environment with strong input form experienced practitioners. Occasionally the patient and oncologist will disagree with what the Tumor Board recommends. It is still then between the patients and the specialist to make the final choice. There are sometimes ego problems that need to be side stepped around as choices are made and implemented.

HMOs may dictate whether a second opinion can occur, and if so where. It may restrict the options as to where chemotherapy and radiotherapy can be provided. There are not restrictions as to whether or not these treatment may be provided, only where and by whom. Occasionally, the specialist will put up a fight with the HMO, if for instance they fell the institution selected by the HMO to provide service is not good enough and they want the patient sent elsewhere.

Patients at Hospital-1 are not the same as the patients at Hospital-2. The patients at Hospital-2 want to be told what to do. The Hospital-1 population tends to be more middle class, well educated people, who want to determine and make their own decisions.

Things are rapidly changing. There is a tensions between the PCP and the medical oncologists growing. The Oncologists feel that they should actually become the PCP for cancer patients, as there needs to be someone familiar with the disease, it side effects, etc. working with the patient over time. This allows any problem encountered along the way to receive prompt, proper intervention. PCPs do not always “understand” the disease. This is occurring on a national level.

**Interviewee:** Case Manager, "Mary"
**Location:** HMO-1
**Date:** April 25, 1995

"We hear that the case managers at HMO-1 are unique, not functioning like most other case managers across the county."
There is an established trigger list of diagnosis published by HMO-1, of which cancer is a member. This list is distributed to PCPs, who are supposed to notify the case managers (CM) if a patient fits into one of the diagnosis. Some providers are on top of this practice, others are not. The CM will also hear from a member advisor at (for example) Clinic-A. OR, worse case scenario, is that the CM picks up the patient in house, in the hospital. Recently, there has been a run of young patients seen at Clinic-A. The case loads of the CM is huge.

They would prefer to see the patient before any procedures are performed or hospitalization is necessary. The goal is to talk to the patient about how they are going to function after the procedures, how they are going home, what to expect pre and post operatively, etc. The CM see the patient in the hospital, then conduct follow-up phone calls. For breast cancer patient, the CM frequently waits to place this phone call until the results of the biopsy if back from the labs, as this information is not always known before the patient goes home. They talk to the patient about what the treatment plan is going to be. Ideally, the CM would talk to the PCP before making initial contact with the patients.

Follow up calls are made to malignant breast cancer patients, to find out what treatment plan has been selected. They can help the patient determine where to have the chemo or hormone therapies performed. Once the patient is hooked up with therapy, there is not much for the CM to do. They have a beeper, and the number is given to the patient, who are encouraged to call if they have any questions or problems. For example, the patient might need nupigen, a drug that it used to increase white blood cell production. It is administered on an outpatient basis, but it can be a challenge for the patients to get through to the pharmacies, clinics, etc. So the CM will handle the arrangements.

Once the patient is through the protocol, the CM is not usually any longer involved in the case. If time permits, the CM will make calls to patients after the fact, to check in. But there are so many other patients. For some, the CM has to intervene once or twice a week.

The primary role of the CM is to facilitate. They get the patient in to see the people they need to see or talk to. They get into more into more of the clinical issues than do the member advisors.

The patients seem to respond well to the service provided. For example, a patient needs a hip replacement. The CM knows because it is elective surgery and the surgeon contacts them to let them know about the patient. The will contact the patient, conduct a physical therapy pre-assessment, asking questions such as how many stairs are in your house, do you have someone to take care of you, etc. The contact is made pre-operatively, to determine how long the patients will be in the hospital, have they discussed rehabilitation options with anyone? The CM will then follow-up with the patient, essentially seeing them through from start to finish, addressing even issues of transpiration. Often the patient or the family just needs someone to think through the process with.
Discharge planners do a lot of this advising. But the pre-op contact with the patient and the CM does really seem to make a difference. The patient thinks about the issues ahead of time. Often the patient does not even know what the issues are when they enter the process.

The CMs are on site in the hospital and see the patients while they are there if at all feasible. Being actually physically present is important. This service and contact does not really exist with fee for service patients.

Communication with the providers is catamount. Member advisors are key. They will for instance provide CM with the names of “frequent flyers”, patients who either come in a lot or call frequently with questions. The CM may actually perform a home visits.

Doctors do not always use the CM service. They simply forget, or it is just another phone call they need to make. But they appear to be delighted with the service and the results it provides.
from surgical diagnosis
Provide Medical Intervention

Select From Treatment Options

Generate PCP Treatment Choice

Discuss Options

Assemble Review Board

Discuss Options by Reviewing Record

Recommend Treatment

Assemble Review Board
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