

California State University, San Bernardino

CSUSB ScholarWorks

Theses Digitization Project

John M. Pfau Library

2007

A feasibility study for establishing a dedicated breast magnetic resonance imaging center in the city of Redlands

Hans Philip Saaty

Follow this and additional works at: <https://scholarworks.lib.csusb.edu/etd-project>

 Part of the [Health Services Administration Commons](#)

Recommended Citation

Saaty, Hans Philip, "A feasibility study for establishing a dedicated breast magnetic resonance imaging center in the city of Redlands" (2007). *Theses Digitization Project*. 3190.
<https://scholarworks.lib.csusb.edu/etd-project/3190>

This Project is brought to you for free and open access by the John M. Pfau Library at CSUSB ScholarWorks. It has been accepted for inclusion in Theses Digitization Project by an authorized administrator of CSUSB ScholarWorks. For more information, please contact scholarworks@csusb.edu.

A FEASIBILITY STUDY FOR ESTABLISHING A DEDICATED
BREAST MAGNETIC RESONANCE IMAGING CENTER
IN THE CITY OF REDLANDS

A Project
Presented to the
Faculty of
California State University,
San Bernardino

In Partial Fulfillment
of the Requirements for the Degree
Master of Business Administration

by
Hans Philip Saaty

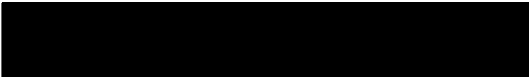
March 2007

A FEASIBILITY STUDY FOR ESTABLISHING A DEDICATED
BREAST MAGNETIC RESONANCE IMAGING CENTER
IN THE CITY OF REDLANDS

A Project
Presented to the
Faculty of
California State University,
San Bernardino

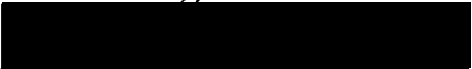
by
Hans Philip Saaty
March 2007

Approved by:



Nabil Razzouk, Ph.D., Chair, Marketing

3-15-07
Date



Mohamad T. Varizi, Ph.D., Accounting &
Finance



Lee Hanson, Ph.D., Department Chair,
Management

ABSTRACT

There are a number of reasons to believe that a dedicated outpatient breast MRI center offers a good or even extraordinary professional business opportunity. Medical technologies continue to rapidly advance and market pressures continue to force all segments of healthcare to simultaneously reduce costs and increase quality of service. The goal is to develop an imaging center that is financially stable and provides superior service and for breast health care.

From the health professional and business perspective, the factors critical to investing successfully in this evolving environment includes having an intimate understanding of medical imaging, an understanding of the impact this type of service is likely to have in the healthcare marketplace, and a solid projection of financial stability.

The internal analysis reflects the general lack of competition in the area of breast MRI services. In addition, there is considerable potential to provide a higher level of service in a dedicated center.

The market analysis demonstrates that there is a sufficient population to make this project feasible, providing the Center is able to accept all payers.

The financial analysis indicates that this project can generate a positive contribution each year, and can sustain its operations long term.

Based on these findings, it is recommended to proceed with a formal business plan that will address build-out specifics, third-party payer negotiations, and a detailed marketing plan.

TABLE OF CONTENTS

ABSTRACT	iii
LIST OF TABLES	viii
LIST OF CHART	ix
CHAPTER ONE: INTRODUCTION	1
Statement of Need	3
Statement of Purpose	3
Methods and Procedures	3
Scope and Limitations	4
Summary	4
CHAPTER TWO: PRODUCT/SERVICE ANALYSIS	
Scope of Services	5
The Space and Physical Structure	6
Technical Specifications and Special Needs	8
Equipment Requirements and Selection	8
Policies and Procedures	9
Developmental Plan	9
Summary	10
CHAPTER THREE: INDUSTRY ANALYSIS	
Industry Demographics and Competitor Analysis	11
Differentiating Factors	12
Summary	14
CHAPTER FOUR: MARKET ANALYSIS	
Customer Profiles	15

Market Demographics	15
Summary	16
CHAPTER FIVE: FINANCIAL ANALYSIS	
Payer Analysis	18
Medicare	19
Medi-Cal	20
Aetna/USHealthcare	21
California Wellpoint Health Network (Blue Cross)	21
California Blue Shield	22
Cigna	22
HealthNet of California	22
PacifiCare of California	23
Rate Information for Third-party Payers	23
Reimbursement for Magnetic Resonance Contrast Media	25
Net Revenue Analysis	25
Start-up Capital Requirements	26
Operating Expense Requirements	27
Contribution Analysis	28
Breakeven Analysis	29
Summary	29
APPENDIX A: MAGNETIC RESONANCE IMAGING SAFETY SCREENING QUESTIONNAIRE	30
APPENDIX B: PRE-BREAST IMAGING QUESTIONNAIRE	32
APPENDIX C: PATIENT FACT CARD EXAMPLE	34

APPENDIX D: UNITED STATES CENSUS STATISTICS QUICK FACTS	36
APPENDIX E: UNITED STATES CENSUS STATISTICS, AGE DETAIL	38
APPENDIX F: BREAST IMAGING CENTER INCOME STATEMENT	40
APPENDIX G: BREAKEVEN ANALYSIS	42
REFERENCES	44

LIST OF TABLES

Table 1. Work Task Timeline	10
Table 2. Net Revenue Assumptions	26
Table 3. Equipment and Construction Costs	27
Table 4. General Operating Costs	28

LIST OF CHART

Chart 1. Breast Magnetic Resonance Imaging Payer
 Mix of Local Hospital 18

CHAPTER ONE

INTRODUCTION

Breast cancer is a major health problem for American women, affecting approximately 1 in 8 American women in their lifetime, and it accounts for over 40,000 deaths per year. Over the past few decades, breast cancer awareness, imaging technology, and access to treatment have improved significantly.

Advances in breast imaging over the past thirty years have been great and are delineated by four major eras. During the first era (1970's - 1984), only screen film mammography was available. The screen film provided a view of tissue densities, but was limited in providing information on sensitivity and specificity of the densities, with a false-negative rate of about 10% to 25%. In the second era (1985 - 1995), mammography was complemented by utilizing higher resolution ultrasound to differentiate between solid and cystic masses, and characterizing solid masses into the categories benign, indeterminate, or high suspicion for malignancy. The third era (late 1999-'s to early 2000s) marked the addition of computer-aided detection, a software program that aids the radiologist in focusing on subtle lesions, especially

subtle/faint micro-calcifications] and full-field digital mammography improving mammographic sensitivity by about 5%. The final major advancements in breast imaging became prevalent in the early 2000's, with the improvement of the computer based, highly-sophisticated breast MRI (Magnetic Resonance Imaging) technology.

The new breast MRI creates an elliptical, homogenous field of view, allowing the radiologist to see full coverage of both breasts, chest wall and axillae in a single scan, without any compromise in image contrast or resolution. Revolutionary imaging technology developed recently by Dr. Harms creates an exceptionally high-quality MR image which allows breast MR to surpass breast mammography in detection of early breast cancer.

Dedicated breast MRI systems are ideal for a wide range of indications in breast disease management including characterizing breast lesions, detecting occult cancer, determining the extent of cancer, monitoring cancer therapy, evaluating patients with positive surgical margins for residual cancer, excluding the existence of cancer in high-risk women, evaluating implant integrity, and detecting cancer in women with breast augmentation.

Statement of Need

Today's woman is more aware of her health care needs. The need for better care has become a focus of attention in the media and publications targeting women. It is in this current climate that interest has focused on breast MRI as an important compliment to mammography. Although some controversy exists among the experts regarding the cost-to-benefit ratio of MRI, many recognize MRI as the next generation in diagnosing breast cancer.

Statement of Purpose

This study is intended to determine the feasibility of establishing a high-quality, free-standing, dedicated breast MR imaging center in the Redlands region.

Methods and Procedures

This study will address the industry dynamics, potential market, and financial sustainability of developing and sustaining such a center through a thorough process of data collection and analysis.

Much data was collected and analyzed in preparing this feasibility study including informal patient interviews, referring physician interviews, internet sources, medical journal literature review, U.S. Census statistics, competitor sources, and vendor research.

Scope and Limitations

The scope of this study is limited to assessing the feasibility of establishing a free-standing, dedicated MRI center in the Redlands region. It does not address the detailed level of analysis necessary to operationalize this project such as such as architectural design, structural parameters, radiology suite contractor selection and construction, engineering, coordination of acoustic and vibration analysis, radiation and magnetic shielding, and special air conditioning needs. In addition, more detailed sizing of the suite rooms, selection of equipment manufacturer and model, and third party contract negotiations will need to be explored.

Summary

This chapter intended to provide a brief history of breast imaging advancements, an understanding of why it may be advantageous to entertain a dedicated breast MRI center as a business venture, and a high-level orientation to the content of this study.

CHAPTER TWO

PRODUCT/SERVICE ANALYSIS

Scope of Services

This state-of-the-art breast MR imaging center will be a special place of service that clients will be proud of, and will provide an innovative niche in the health care marketplace. It will combine cutting edge technology with old fashion values.

The hours of operation will be 7 AM to 7 PM during 4 out of 5 weekdays, and 7 AM to 9 PM on Thursdays. In today's busy and fast-paced lifestyle, it is often difficult for patients to visit a health care facility during the more typical business hours of 8 AM to 5 PM. These few extra hours are strategically positioned to improve satisfaction for patients and referring physicians, thus encouraging future referrals.

The breast MRI center will be located near the downtown Redlands community, in close proximity to two major medical centers, and accessible to a major thoroughfare. As physician's offices are typically located in close proximity to hospitals, this site will be centrally located to a strong referring physician base. On-site parking will complement the facility.

The Space and Physical Structure

The 1,300 square foot breast MRI Suite includes a handicapped-accessible, MRI unit room, waiting room, reception desk, dressing rooms, toilets, clean/soiled utility rooms, storage, and a radiologist reading room.

The recommendations put forth by the AJR in June of 2002 is that MRI facilities be zoned, as a way of insuring patient and staff safety. The first space that the visitors enter in the MRI suite, i.e., the waiting and reception areas is designated as Zone 1. The next zone, Zone 2, is the connector between the publicly accessible, uncontrolled Zone 1 and the strictly controlled Zones III and IV, which in this facility will include the patient dressing rooms and the gowned waiting room. The control room and the room containing the electronic equipment for the scanner are located in Zone 3 and designated as the area in which uncontrolled access by unscreened non-MR personnel and/or ferromagnetic objects and equipment can result in serious injury or death. The most secure zone, Zone 4, is the MR scanner room which is only accessible from the control room.

Following these recommendations, the patient waiting room will be near the MR facility entry, abutting the reception area, and will have an easily accessible toilet

room. The MRI unit will be located toward the back, so that traffic flowing through the department is kept to a minimum. Two dressing rooms and a gowned waiting room will be located in proximity to the procedure room and an additional toilet room will be accessible from both the dressing room and the gowned waiting room.

As to personnel flow, the work configuration is designed in such a way as to separate staff and patient traffic. The radiologist reading room is large enough for a few clinical staff to collaborate, but small enough for acoustic and visual privacy. A consultation room will be located next to the radiologist reading area to avoid disturbing private reading area. A separate medical directory office should be centralized, with easy access to the procedure room, radiologist reading room, as well as the reception area.

In regards to Information flow, several terminals will be strategically located to provide for electronic acquisition and distribution of data. In addition, the system will support remote access, allowing for out-of-office reading and consultations.

Technical Specifications and Special Needs

The MRI equipment specifications and performance shall meet all state and federal requirements. The breast MR unit footprint needs a minimum of 550 square feet. It weighs approximately 8,500 pounds, and it is best if placed on the ground floor with no basement so that one dimension of the magnetic field is directed into the earth. The control room will be about 125 square feet. The room will be shielded in accordance with regulatory requirements as well.

Equipment Requirements and Selection

Several MRI systems were analyzed during the equipment selection process, including Aurora, Seimans, GE, and Toshiba. In the end, Aurora was the clear choice in breast MRI systems. The Aurora 1.5T Dedicated Breast MRI System is the only FDA approved, dedicated, and integrated MRI system designed specifically for breast imaging. With an exclusive precision gradient coil design, the Aurora System provides an elliptical "sweet spot" that images both breasts, chest wall, and axillae in a single bilateral scan without compromise in image contrast or resolution. The company offers an exclusive bilateral 3-D

technology that offers higher image quality and superior dynamics, for superior breast disease diagnosis.

In addition, the Aurora system possesses a fully integrated, biopsy system. The system also incorporates a user-friendly computer-aided detection workstation facilitating the physician in making the correct diagnosis. This MR system has a table design that is comfortable for the patient allowing her to enter the imaging system feet-first, improving compliance and decreasing anxiety for claustrophobic patients.

Policies and Procedures

Establishing policies and procedures related to quality, patient education, infection control, and safety is to be implemented in accordance to the American College of Radiology.

Developmental Plan

It is estimated that this project will take approximately 17 months to complete. Much of this time will be spent in facility planning and construction, as this center will be a new freestanding facility. The table below details the major tasks and respective time allocations.

Table 1. Work Task Timeline

Function	Date Range
Project financing	4/1/07 - 4/30/07
Finalizing equipment purchase	5/30/07
Facility Design and Construction	5/1/07 - 4/30/08
MR Installation and Calibration	5/1/08 - 5/30/08
Staffing Plan	2/1/08 - 5/30/08
Customer Service Training	6/1/08 - 6/30/08
Management Service Contracts	1/2/08 - 3/30/08
State Licensing	1/2/08 - 4/30/08
Marketing and Communication Plan	3/1/08 - 7/01/08
Final Application Training	7/1/08 - 7/30/08
Patient Scheduling	7/1/08 - 7/30/08
Grand Opening of Imaging Center	8/1/08

Summary

This chapter attempted to define the breast imaging center concept, provide an orientation to the general constructs of the center, and propose a timeline to completion.

CHAPTER THREE
INDUSTRY ANALYSIS

Industry Demographics and Competitor Analysis

The services of the proposed breast MR imaging center are unique to the region. Currently, there are only 22 dedicated breast MRI units in the entire country, and only 3 in California. Within a 60-mile radius, no dedicated breast MRI facilities exist. The uniqueness of this proposed medical facility is that it will provide a rare state of-the-art technology, offering higher sensitivity and specificity than mammography, without the added risk of radiation from X-rays.

There is only one medical facility within the region of interest that offers diagnostic only breast imaging on a non-dedicated breast MRI system. This provider uses a breast coil for the study, resulting in a more limited diagnostic detail than the proposed dedicated breast MRI system. Schedule availability is limited at this facility, with an average backlog of 2 weeks or greater. As this facility serves the needs of all diagnostic patients, it is difficult for them to cater to the unique needs of women suffering from breast cancer.

Differentiating Factors

The proposed breast MR imaging center will differentiate its services from its competitors with a focus in three key areas: competence, customer service, and accessibility. It is the uncompromising goal and expectation that women who will be undergoing imaging breast evaluation at this proposed facility and their referring physicians report exceptional satisfaction with their experience.

Competence is paramount in complex imaging and begins with acquisition of skilled technologists and a focus on patient safety. The advantages of providing services to a dedicated market are numerous. First, the technologist performs a limited subset of imaging studies, thus improving their skill set faster than a general technologist and ensuring standardization and quality of the study. Second, the center will be able to employ appropriate technologists. A higher-quality diagnostic breast study will be obtained when the patient is relaxed and can cooperate with the instructions of the procedure. For female patients (which comprise greater than 99.5 % of patient's undergoing breast imaging evaluation), it is essential that female technologists, nurses, or assistants be involved in patient positioning and testing. Third,

patient safety can be better monitored in an intimate setting with fewer personnel interacting with the client. An example of this strict patient safety focus is the MRI Safety Screening Questionnaire located in Appendices A and B. This interaction with the patient prior to screening ensures the client that their safety is important and limits potential error on the practitioner's side.

Patient-focused customer service initiatives will aim to educate the patient prior to their imaging appointment, create an esthetically attractive and relaxing atmosphere at the center, develop a caring culture with friendly and competent personnel, and provide continued support for the patient and family, including information resources, exercise options, therapy programs, and support groups. An example of patient education can be found in Appendix C.

Physician-focused customer service initiatives include pre-printed prescription pads with driving directions and a map included on the back of each prescription, electronic access to results through a secure connection, same-day interpretation standards, and direct communication access with the center's radiologists. These initiatives speed the throughput process so that detection-to-diagnosis-to start of therapy can be achieved within as short a time frame as possible.

Accessibility for both customers will include a wider range of facility hours, convenient parking, and easy access to clinicians providing services.

Summary

It is evident that there is little competition in the regional marketplace for dedicated breast MRI services. Based on this information, and the Center's ability to differentiate itself from the minimal competition, it is likely that the Center will be able to establish itself in the Redlands area.

This chapter attempts to provide an overview of the breast imaging industry at large and locally, as well as highlight important factors necessary to compete in the regional market.

CHAPTER FOUR

MARKET ANALYSIS

Customer Profiles

The American Cancer Society recommends breast imaging screening begin in women at the age of 40. In cases where the client has a strong family history of breast cancer (i.e., a mother or sister with breast cancer), then breast-imaging screening should start 10 years prior to when the close relative was first diagnosed. For clients with clinical symptoms, breast MRI imaging can be done at any age.

It is well documented that location is an important consideration in accessing health care services. Patients will typically choose a health care provider for routine needs based on perception of quality and payer association respective to a defined location.

Market Demographics

The U.S. Census statistics, provided in detail in Appendices D and E, reports the female population of Redlands as 34,000. The total population of men and women age 40 and above is about 25,000 people. Females make up about 53% of this population group, hence the total number of females age 40 and above is estimated as 13,250.

On average, the Redlands resident is more affluent and better educated in comparison to other Californians. The city boasts a high school graduate rate of 86.6% versus a California state rate of 76.8%. In addition, 35.2% of residents have a Bachelor's degree or higher versus 26.6% of Californians statewide. The median per capita income for a Redlands resident is about \$24,237 versus \$22,711 throughout the state.

These statistics are important in light of the facts that educated patients with financial means are most likely to research and obtain the latest advancements in health care technology and delivery.

The proposed breast MRI center is projecting 5 patients per day. As the Center operates 252 calendar days per year, it will need to screen 1,260 patients annually to meet its targets. This equates to 9.5% of the target market.

Summary

Based on this information, it is realistic to assume that this Center will realize the projected volumes, considering the general absence of competition in the local market. This assumption is based on another primary

assumption; that the Center will be able to accept all payer sources associated with the target clientele.

It will be essential to understand the payers in the San Bernardino region, as they can be considered a customer and their rates are variable by region. This will ultimately affect the Center's financial success, and will be discussed in detail in the following chapter.

This chapter attempts to provide an overview of the market and its customers, as well as establish a projection of realistic volume.

CHAPTER FIVE
FINANCIAL ANALYSIS

Payer Analysis

The chart below depicts the payer mix for breast MRI procedures performed at a local hospital.

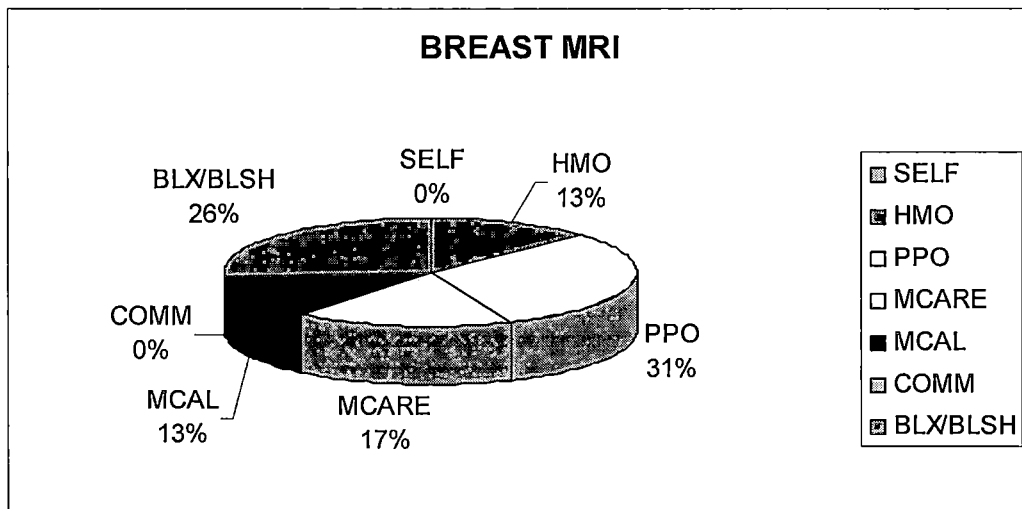


Chart 1. Breast Magnetic Resonance Imaging Payer Mix of Local Hospital

As noted, 40% of payments come from governmental sources (i.e. Medicare and MediCal), and 60% of payments are from third party payers. While governmental payers tend to pay on a fixed fee schedule, managed organizations typically negotiate their rates. Therefore, it is important to understand the payer's constructs prior to pursuing contracts.

Medicare

2007 CPT Code Changes for Breast MR Procedures.

Effective January 1 2007, CPT codes 76093 and 76094 were deleted. New codes became effective at that time. The new codes are:

- 77058 MRI without followed by with contrast,
breast; unilateral
- 77059 MRI without followed by with contrast,
breast; bilateral

Medicare Part B - National Health Insurance Corporation (NHIC) is the Medicare Part B insurance carrier for this locale and they have the new CPT codes in their system:

For procedures performed in the freestanding facility setting, the Medicare Part B 2007 reimbursement par-rates for locale 99 which includes San Bernardino County are as follows:

77058	global	\$832.50
77058	professional	\$78.38
77059	global	\$1028.98
77059	professional	\$78.38

In 2007, Medicare Part B will reimburse for 3D reconstruction billed with CPT code 76377 at the rate of \$161.18 for the global payment.

The CAD code (0159T) became effective on July 1, 2006, and while it is recognized by this Carrier as an acceptable code, it is not on the 1st quarter 2007 fee schedule, but will be accepted as a tracking mechanism.

Please note the 2007 professional component reimbursements above were adjusted up by 5% to account for the roll back of the reduction that was to have been a result of the application of the Sustainable Growth Formula to the professional component. Carriers are in the process of re-calculating the fee schedules at this time.

At this time, breast MR procedures are not included on the Capped Fees File which includes all medical imaging procedures subject to the DRA reductions.

MR contrast agents will continue to be reimbursed at ASP plus 6 percent in 2007.

Medi-Cal

Medi-Cal will cover breast MR procedures from the same coverage policy as Medicare and reimburses from the CPT codes as follows:

76093	\$361.69
76094	\$478.19

The payer reimburses for 3D reconstruction at the rate of \$170.54, effective 12/01/06. This payer will update for

the new codes "as soon as possible", but should be monitored for denials.

Aetna/USHealthcare

This payer will accept the new CPT codes for breast MR procedures, CPT 76377 for the 3D reconstruction and MR contrast media reported with the HCPCS code that corresponds to contrast used in the procedure. Aetna considers breast MRI medically necessary for screening of women considered to be at high genetic risk of breast cancer because of a) confirmed presence of BRCA1 or BRCA2 mutation; or b) who meet criteria for genetic screening for breast cancer as established in the Aetna medical coverage policy.

California Wellpoint Health Network (Blue Cross)

This plan covers high-risk screening for women with the BRAC1 and BRAC2 mutation, patients considered to be at high familial risk for breast cancer (those with a family history suggestive of hereditary breast cancer), those patients for which mammography is limited by factors such as those with dense or distorted breasts, and for screening the contralateral breast in patients who have breast cancer. There is no reference to CAD in this policy, and in discussions with the payer, it was discovered that the payment for CAD is bundled into the

procedure reimbursement. The code for 3D reconstruction is covered as an add-on and separately payable with the limits of the patient's benefits. The plan does have the new CPT codes in its coverage policy.

California Blue Shield

California Blue Shield also will cover high-risk screening for women with the BRAC1 and BRAC2 mutation and patients considered to be at high familial risk for breast cancer. They also cover 3D reconstruction, if performed as a separate service and not simply an automatically generated add-on.

Cigna

Cigna has a policy that lists the CPT codes 76094 for breast MR and 76377 for 3D reconstruction procedures, but has stated they will update their system to accept the new codes effective January 1st 2007. This payer also accepts product specific HCPCS code for MR contrast agents. This payer will reimburse for screening of women considered to be at high genetic risk of breast cancer.

HealthNet of California

This regional payer has an established policy for breast MR For screening of women considered to be at high genetic risk of breast cancer because of any of the following: Confirmed presence of BRCA1 or BRCA2 mutation;

or patients who meet criteria for genetic screening for breast cancer as outlined in BRCA testing policy and Prophylactic Mastectomy Policy (PMP). HealthNet policy lists the CPT codes 76093 and 76094 for the primary procedure and 3D reconstruction, but will accept 77058 and 77059 effective January 1st.

PacifiCare of California

This managed care plan will cover high-risk screening for women with the BRAC1 and BRAC2 mutation and patients considered to be at high familial risk for breast cancer as well as 3D reconstruction. PacifiCare will be updating its system to accept the new CPT codes for breast MR procedures, and accepts 76377 for 3D reconstruction procedures; CAD code 0159T is not separately payable with this payer.

Rate Information for Third-party Payers

Private third-party payers establish Usual and Customary Charge (UCC) Fee Schedules for covered procedures. Usual and Customary Charges are how payers reimburse for both the technical and professional component of procedures; contrast agents will most often be reimbursed at cost. Unlike fee schedules for governmental payers such as Medicare, Medicaid and

Tri-Star, private payers cannot be compelled to make payment rate data public. Information on private payment is obtained from the Practice Management Information Corporation (PMIC) which compiles payment data by payer, by locale on an annual basis. UCC payments are the rate a provider will receive if the procedure billed is not covered under a contract between the facility and the payer. The UCC data provided by PMIC will often be less, or in some cases more, than a provider may be receiving under the terms of a contract with a specific payer. UCC rates should be thought of as benchmarks with private payers.

For San Bernardino County, PMIC provided the following range of reimbursement rates for those third-party payers that have coverage policies and UCCs established for breast MR:

Low	\$799
High	\$1156
Average	\$991

The 3D reconstruction billed with CPT code 76377 is paid an average global rate of \$225 statewide. Reimbursement rates will also vary in accordance to the particulars of the contract between the plan and the purchaser, with policies having a range of co-pays and medical necessity

and prior authorization requirements. These 2007 reimbursement rates are based on 2006 historical data as compiled by PMIC.

Reimbursement for Magnetic Resonance Contrast Media

While not all third-party payers will reimburse for MR contrast it is important to report the use of these agents to show utilization. Medicare does not reimburse for MR contrast in the freestanding facility setting except in certain instances of high-dose administration. When reimbursement is made for high-dose MR contrast, it will be based on either 106% of Average Sales Price (ASP) or invoice. The Medicare Part B Carrier may request a copy of the invoice to determine cost and payment. Private insurance plans will reimburse contrast agents in a number of ways: flat rate, invoice or incorporate reimbursement for contrast into the procedure payment.

Net Revenue Analysis

Based on this detailed analysis of payers, as assumption was made that the Center's average net revenue per case will be \$1,089.79, and the annual net revenue will be \$1,373,135, assuming 1,260 cases per year.

Table 2. Net Revenue Assumptions

<u>NET REVENUE:</u>	<u>Exams/Day</u>	<u>Exams/Yr</u>	<u>Exams 1st Yr</u>
Breast MRI Scans	5	1,260	420
Average Net Revenue per Patient		\$ 1,089.79	
Total Annual Net Revenue		\$ 1,373,135	
* Estimate first Year Net Revenue		\$ 457,712	

Start-up Capital Requirements

Equipment and Construction Costs are a significant consideration in determining the feasibility of this project. These dollars will be invested at start-up and depreciation of these expenses will be 5 years for equipment and 20 years for facility construction. Construction costs were based on estimates from a local architect who specializes in medical facility construction. The detailed costs are contained in Table 3 below.

Table 3. Equipment and Construction Costs

<u>Equipment:</u>	<u>Units</u>	<u>Unit Cost</u>	<u>Total Unit Cost</u>
Aurora Breast MRI	1	\$ 1,345,000	\$ 1,345,000
Vaccum Assisted Breast Biopsy	1	\$ 45,000	\$ 45,000
Total Equipment Costs			\$ 1,390,000

<u>Construction & Soft Goods:</u>	<u>Sq.Ft.</u>	<u>Cost/Sq.Ft.</u>	<u>Total Cost</u>
Permits (included below)			\$ -
Construction	1300	\$ 600	\$ 780,000
Total Construction Expense			\$ 780,000

Operating Expense Requirements

General operating costs are another significant consideration in assessing the feasibility of this Center. The risk on these variable expenses are much less than the fixed expenses noted earlier, and will be volume dependant.

To summarize, it is estimated that the cost of operating the center will be \$954,642 annually, assuming 1,260 cases in the same time frame. Table 4 details these expenses.

Table 4. General Operating Costs

EXPENSES:

	<u>Paid Fte</u>	<u>Per/Unit</u>	<u>Annual</u>
Wages - technologist	1.25	\$ 29.08	\$ 67,502
Wages - Clerical	1.00	\$ 13.72	\$ 25,478
Benefits			\$ 31,613
Other Expenses		\$ 8.09	\$ 10,193
Medical Supplies/scan		\$ 61.50	\$ 77,490
Service Maintenance			\$ 139,000
Depreciation			\$ 316,973
<hr/>			
Sub-Total Direct Expense			\$ 668,250
<u>Indirect Expense</u>			<u>\$ 286,393</u>
Total Expense			\$ 954,642

Contribution Analysis

The five-year proforma documented in Appendix F demonstrates the Center's sustainability. In year one, the Center will experience a positive contribution of \$62,877 and a total projected contribution of five years of \$1,962,188. This speaks to the strength of the Center's operations, and is assuming a consistent reimbursement rate per case over the next five years.

Breakeven Analysis

In analyzing the Center's projected revenue and estimated expenses, the Center would break even in 41 months, or 3.2 years as referenced in Appendix G.

Summary

Upon full review of the financial analysis, this project demonstrates positive financial potential from operations each year and sustainability long term, assuming favorable contracts with third-party payers.

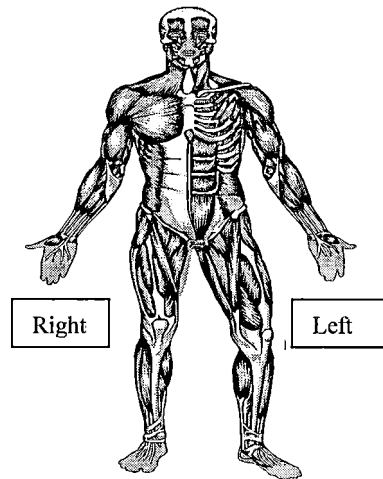
This chapter attempts to analyze the payer environment that will affect revenues, document revenue and expense assumptions, and project the financial sustainability of the Center.

APPENDIX A
MAGNETIC RESONANCE IMAGING SAFETY
SCREENING QUESTIONNAIRE

Please indicate if you have any of the following:

- | | | |
|--|------------------------------|-----------------------------|
| Aneurysm clip(s) | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| Cardiac Pacemaker | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| Implanted cardioverter defibrillator(ICD) | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| Electronic implant or device | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| Magnetically-activated implant or device | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| Neurostimulation system | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| Spinal Cord Stimulator | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| Internal electrocodes or wires | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| Bone growth/bone fusion stimulator | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| Cochlear, otology, or other ear implant | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| Insulin or other infusion pumps | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| Implanted drug infusion device | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| Any type of prosthesis (eye, penile, etc) | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| Heart valve prosthesis | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| Eyelid spring or wire | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| Artificial or prosthetic limb | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| Metallic stent, filter or coil | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| Shunt (spinal or intraventricular) | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| Vascular access port and/or catheter | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| Radiation seeds or implants | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| Medication patch (Nicotine, Nitroglycerine) | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| Any metallic fragment or foreign body | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| Wire mesh implant | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| Tissue expander (e.g. breast) | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| Surgical staples, clips, or metallic sutures | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| Joint replacement (hip, knee, etc.) | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| Bone/joint pin, screw, nail, wire, plate, etc. | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| IUD, diaphragm, or pessary | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| Dentures or partial plates | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| Tattoo or permanent make-up | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| Body piercing jewelry | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| Hearing aid | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| (Remove before entering MR system room) | | |
| Other Implants _____ | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| Breathing problem or motion disorder | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| Claustrophobia | <input type="checkbox"/> Yes | <input type="checkbox"/> No |

Please mark on the figure(S) below for the location of any implant or metal inside or on your body.



I attest that the above information is correct to the best of my knowledge. I read and understand the contents of this form and had the opportunity to ask questions regarding the information on this form and regarding the MR procedure that I am about to undergo.

Signature of Person Completing the form

Form Information Reviewed by:

Date: ___ / ___ / ___

Print Name

Form Completed by: Patient Relative Nurse Translator MRI Tech Radiologist

APPENDIX B

PRE-BREAST IMAGING QUESTIONNAIRE

Pre-Breast imaging Questions:

1. Please provide your name/date of birth/ address/ telephone:
2. Do you have breast implants? (yes/no)
3. Is this a follow-up to an abnormal mammogram? (yes/no)
4. Do you have any breast problems such as a lump, pain or discharge? (yes/no and if "yes", describe: _____)
5. Did you or your doctor feel a lump in your breasts? (yes/no, if "yes", where? _____ and how long has it been there? _____)
6. Have you had breast cancer without the removal of your breast? (yes/no, if "yes" did you have radiotherapy (yes/no) or chemotherapy (yes/no)?)
7. Have you had previous breast surgery or biopsy? (yes/no, if "yes" which side was it done on (right/left/both), in what month and year when was it performed _____?, and what was found _____?)
8. Has any blood relative has breast cancer? (yes/no)
9. What is your age?
10. Are you still having menstrual periods? (yes/no)
11. Are you taking hormone therapy (yes/no, if "yes", what type: _____)
12. Are you pregnant or nursing? (yes/no)
13. Do you have breast tenderness or pain at any time during the month? (yes/no, if "yes", schedule mammogram when breasts are less tender.)
14. If you have pain, is it in one spot? (yes/no)
15. Have you had a mammogram before? (yes/no, if "yes", where was it done _____ and how long ago _____?)
16. Information on your primary physician or health care provider (name/address/telephone):
17. When was the last time you saw your health care provider?
18. Do you have written referral (prescription) for this mammogram (yes/no, if "yes", please provide referral form)
19. Does your healthcare provide know that you are scheduling mammography? (yes/no, if "no" the provider should be informed)
20. Is there any other information that would be helpful for us to know?

Source: imagineis.com/breasthealth/questionnaire.asp

APPENDIX C

PATIENT FACT CARD EXAMPLE

INTRODUCTION

MRI, magnetic resonance imaging, is a diagnostic procedure to view areas of the body without using X-rays. Magnetic fields and radio waves are used to detect the size and location of tumors using a large, donut-shaped magnet. Breast MRI is used after a mammogram if more detail is necessary because the doctor suspects there may be disease that the mammogram cannot detect. You cannot have a breast MRI if you have a breast tissue expander or cardiac pacemaker.

PREPARATION

- If you have a condition that makes it difficult for you to lie still in an enclosed area (claustrophobia), or if lying on your stomach with your arms stretched out above your head for 30 to 60 minutes without moving is difficult, tell your doctor before the breast MRI so that medication can be prescribed to help ease any discomfort you may have.
- No other preparation is required. You may take medication(s) as usual.

TIME

The examination takes up to 40 minutes for both breasts.

PROCEDURE

- You will need to take off your jewelry, bra, and other clothing items that contain metal, such as zippers or metal buttons.
- You will be able to store your belongings in a locker provided for you.
- Do not take any watches or any card with a magnetic strip (such as a credit card) into the MRI machine, as they may not work once exposed to the magnetic field.
- Before your breast MRI, the procedure will be explained to you, and any questions you have will be answered.
- An intravenous line (IV) will be placed in a vein to give you an injection of a contrast medium called gadolinium-DTPA. The contrast makes it possible to see any abnormality in the breast. The IV will be removed at the end of your procedure.
- You will be asked to lie on your stomach on the MRI table. Once you are positioned, it is extremely important that you do not move during the examination. Your breast will be placed into two holes in the table and will be immobilized by compression paddles.
- You may request earphones so that you can listen to music or earplugs to make you more comfortable and to reduce the clicking sound you will hear from the MRI machine.
- You will be able to talk with the MRI technologist at any time during the examination. If you become uncomfortable in the MRI machine, tell the technologist.

AFTER THE PROCEDURE

- The site where the contrast medium was injected will be covered with an adhesive bandage (Band Aid).
- A report of the scan will be sent to your doctor within a few days after your test.

Copyright 1999 Memorial Sloan-Kettering Cancer Center, 1275 York Avenue, New York, NY 10021. Revised 2001

APPENDIX D

UNITED STATES CENSUS STATISTICS QUICK FACTS

People Quick Facts

Population, 2003 estimate
 Population, percent change, April 1, 2000 to July 1, 2003
 Population, 2000
 Persons 65 years old and over, percent, 2000
 Female persons, percent, 2000
 High school graduates, percent of persons age 25+, 2000
 Bachelor's degree or higher, pct of persons age 25+, 2000
 Mean travel time to work (minutes), workers age 16+, 2000

Redlands California

67,859 35,484,453
 6.70% 4.80%
 63,591 33,871,648
 12.60% 10.60%
 52.80% 50.20%
 86.60% 76.80%
 35.20% 26.60%
 23.5 27.7

Housing units, 2000
 Homeownership rate, 2000
 Median value of owner-occupied housing units, 2000

24,790 12,214,549
 60.40% 56.90%
 \$159,300 \$211,500

Households, 2000
 Persons per household, 2000
 Median household income, 1999
 Per capita money income, 1999
 Persons below poverty, percent, 1999

23,593 11,502,870
 2.61 2.87
 \$48,155 \$47,493
 \$24,237 \$22,711
 10.50% 14.20%

Business QuickFacts

Wholesale trade sales, 1997 (\$1000)
 Retail sales, 1997 (\$1000)
 Retail sales per capita, 1997
 Accommodation and foodservices sales, 1997 (\$1000)
 Total number of firms, 1997
 Minority-owned firms, percent of total, 1997
 Women-owned firms, percent of total, 1997

Redlands**California**

161,216 548,864,451
 560,804 263,118,346
 \$8,390 \$8,167
 59,116 42,312,641
 4,790 2,565,734
 18.00% 28.80%
 21.60% 27.30%

Geography QuickFacts

Land area, 2000 (square miles)
 Persons per square mile, 2000
 FIPS Code

Redlands**California**

35 155,959
 1,793.10 217.2
 59962 6

Source U.S. Census Bureau: State and County QuickFacts. Data derived from Population Estimates, 2000 Census of Population and Housing, 1990 Census of Population and Housing, Small Area Income and Poverty Estimates, County Business Patterns, 1997 Economic Census, Minority- and Women-Owned Business, Building Permits, Consolidated Federal Funds Report, Census of Governments
 Last Revised: Friday, 12-Jan-2007 16:03:49 EST

APPENDIX E
UNITED STATES CENSUS STATISTICS, AGE DETAIL

Subject	Number	Percent
Total population	63,591	100
SEX AND AGE		
Male	30,024	47.2
Female	33,567	52.8
Under 5 years	3,964	6.2
5 to 9 years	4,684	7.4
10 to 14 years	5,014	7.9
15 to 19 years	5,231	8.2
20 to 24 years	4,554	7.2
25 to 34 years	8,254	13
35 to 44 years	9,498	14.9
45 to 54 years	9,043	14.2
55 to 59 years	3,026	4.8
60 to 64 years	2,342	3.7
65 to 74 years	3,742	5.9
75 to 84 years	2,980	4.7
85 years and over	1,259	2
Median age (years)	35.1	(X)
18 years and over	46,940	73.8
Male	21,620	34
Female	25,320	39.8
21 years and over	43,614	68.6
62 years and over	9,375	14.7
65 years and over	7,981	12.6
Male	3,084	4.8
Female	4,897	7.7

APPENDIX F
BREAST IMAGING CENTER INCOME STATEMENT

	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5
<u>Initial Capital Costs:</u>		5.0% incr	5.0% incr	5.0% incr	5.0% incr	5.0% incr
Equipment and Construction	\$ 2,170,000					
<u>Added Net Revenue:</u>						
Total Net Revenue for all Additional Studies		\$ 457,712	\$ 1,373,135	\$ 1,441,792	\$ 1,513,882	\$ 1,589,576
Sub-Total Addtl Revenue		\$ 457,712	\$ 1,373,135	\$ 1,441,792	\$ 1,513,882	\$ 1,589,576
<u>Expense:</u>		5.0% incr	5.0% incr	5.0% incr	5.0% incr	5.0% incr
Wages and Benefits	\$ 41,531	\$ 130,823	\$ 137,364	\$ 144,232	\$ 151,444	
Medical Supplies	\$ 25,830	\$ 81,365	\$ 85,433	\$ 89,704	\$ 94,190	
Other Expenses	\$ 3,398	\$ 10,703	\$ 11,238	\$ 11,800	\$ 12,390	
Service Maintenance		\$ 139,000	\$ 139,000	\$ 139,000	\$ 139,000	
Indirect Expense	\$ 7,076	\$ 286,393	\$ 300,712	\$ 315,748	\$ 331,535	
Depreciation	\$ 317,000	\$ 317,000	\$ 317,000	\$ 317,000	\$ 317,000	
Sub-Total Expenses	\$ 394,835	\$ 965,283	\$ 990,747	\$ 1,017,485	\$ 1,045,559	
<u>Net Contribution</u>	\$ 62,877	\$ 407,852	\$ 451,045	\$ 496,397	\$ 544,017	
<u>Add back Depreciation</u>	\$ 317,000	\$ 317,000	\$ 317,000	\$ 317,000	\$ 317,000	
<u>Net Cash per Year</u>	\$ 2,170,000	\$ 379,877	\$ 724,852	\$ 768,045	\$ 813,397	\$ 861,017

APPENDIX G
BREAKEVEN ANALYSIS

Payback
6.25%

	Cost (-)	Expense (-)	Income (+)	Net
Year 0	\$ (2,170,000)			\$ (2,170,000)
Year 1	\$	(77,835) \$	457,712 \$	\$ 379,877
Year 2	\$	(648,283) \$	1,373,135 \$	\$ 724,852
Year 3	\$	(673,747) \$	1,441,792 \$	\$ 768,045
Year 4	\$	(700,485) \$	1,513,882 \$	\$ 813,397
Year 5	\$	(728,559) \$	1,589,576 \$	\$ 861,017
	\$ (2,170,000) \$	(2,828,909) \$	6,376,097 \$	\$ 1,377,188
Totals	\$	(4,998,909) \$	6,376,097 \$	\$ 1,377,188

Payback	3.42 years
	41 months

REFERENCES

- AMA Physician ICD-9-CM 2006, Volumes 1 and 2
- American College of Radiology. Breast Imaging Reporting and Data System (BI-RADS). 2nd ed. Reston, VA: American College of Radiology; 1995.
- Burnside E. Belkora J & Esserman L 2001 The impact of alternative practices on the cost and quality of mammographic screening in the United States. *Clinical Breast Cancer* 2 145-152.
- Deurloo, S. H. Muller, Peterse, J. L., Besnard, A.P.E., and Cilhuijs, K.G.A. Clinically and mammographically occult breast lesions on MR images: Potential effect on computerized assessment on clinical reading. *Journal of Radiology* 2005; 234; 693-701.
- Flickinger FW, Allison JD, Sherry RM & Wright JC 1993 Differentiation of benign from malignant breast masses by time-intensity evaluation of contrast enhanced MRI. *Magnetic Resonance Imaging* 11 617-620.
- Franks D.L., Fiscal Fitness, Southern California Physician, July 2006; 12-17.
- Friedman, P.D., Swaminathan, S.V., Herman, and Kalisher, L. Breast MRI: the importance of bilateral imaging. *Am. J. Roentgenol.*, 2007; 187(2): 345-349.
- Harms SE 1999 Technical report of the international working group on breast MRI (In Process Citation). *Journal of Magnetic Resonance Imaging* 10 979.
- Hylton NM & Frankel SD 1994. Imaging techniques for breast MR imaging. *Magnetic resonance imaging clinicians of North America* 2 511-525.
- Kopans, Daniel B. Breast Imaging, Third Edition, Lippincott Williams & Wilkins, Philadelphia 2007.
- Morris, Elizabeth A., Liberman, Laura, Ballon, Douglas J., Robson, Mark, Abramson, Andrea F., Heerdt, Alexandra and Dershaw, D. David. MRI of occult breast carcinoma in a high-risk population. *American Journal of Roentgenology* 181 (3) 619-624.

Morris, Elizabeth A., Liberman, Laura. Breast MRI,
Springer Science & Business Media 2005.

Schnall M. Orel S & Lo LD 2001 MR imaging of the breast in
patients with invasive lobular carcinoma. American
Journal of Roentgenology 176 399-406.

Smith, Rich. America's Busiest Imaging Center. Imaging
Economics, September 2006.

Warner EPD, Shumak RS, Catzavelos GC, et al. Comparison of
breast magnetic resonance imaging, mammography, and
ultrasound for surveillance of a women at high risk
for hereditary breast cancer. J Clin Oncol.
2001;19:3524-3531.