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# Continuum of cardiac care

David K. McClure

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# **THE CONTINUUM OF CARDIAC CARE**

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MBA-H  
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Presented to the faculty of Cardinal Stritch University  
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Master of Business Administration  
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Approval Page

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### **Executive Summary**

Ohio Valley Medical Center is a 453-bed acute care hospital in Wheeling, West Virginia. The hospital is centrally located in the Upper Ohio Valley and provides tertiary care services to a patient population in excess of 150,000. The hospital provides the full array of cardiac services with the exception of open heart surgery and coronary angioplasty. The hospital must determine the need and financial viability to institute these services. The financial stability of the organization and the health care needs of the patient population depend on the continuum of cardiac care.

The researcher established need through a recognized methodology. Need was well documented and financial viability was proven. Alternatives to the establishment of an open heart surgery and coronary angioplasty program at Ohio Valley Medical Center are provided. All documentation was in order with established protocols set forth by the state of West Virginia.

The researcher recommended the development of the program after certificate of need approval from the state of West Virginia and provided alternative solutions if the certificate of need was not granted.

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## Chapter 1: Introduction

### Overview of the Research Project

The Upper Ohio Valley is a geographic region comprised of the northern panhandle of West Virginia, eastern Ohio and western Pennsylvania. Within this region is a high incidence of heart disease. Statistical data from both the federal and state government has documented that West Virginia ranks number one in heart disease related illnesses as compared to other states in the nation. The provision of cardiac care is most important to the patient population of this region.

Ohio Valley Medical Center is a 453-bed acute care hospital in Wheeling, West Virginia. The hospital is centrally located within the Upper Ohio Valley and provides tertiary care services for a patient population in excess of 150,000. The hospital provides a full array of cardiac care services for this patient population and was recognized as a referral facility for surrounding primary care hospitals. The missing link in cardiac care services was open heart surgery and coronary angioplasty. For the hospital to provide a continuum of cardiac care the missing components needed to be in place.

The West Virginia State Health Plan made no provision for this level of cardiac care outside of the three university based hospitals in the state. All patients requiring either cardiac surgery or coronary angioplasty needed to either leave the state of West Virginia and travel no less than 60 miles to Pittsburgh, Pennsylvania or travel no less than 90 miles to a West Virginia hospital that was recognized by the State Health Plan to provide invasive cardiac procedures.

### Organizational and Environmental Profiles

Ohio Valley Medical Center is a community-based hospital in a rural state that is highly

regulated by a State Health Plan and governed by a State Health Care Authority. West Virginia recognizes only university based hospitals as sites for the provision of open heart surgery and coronary angioplasty. To provide new services a hospital must prove need and financial viability. This process was considered a certificate of need. Many states in the United States have found that certificate of need laws are antiquated and do not ensure quality care and efficient use of health care resources. The state of West Virginia was not one of those states. The researcher proved need utilizing a recognized methodology, compared the need to the recognized quality standards set forth by the American College of Cardiology and established financial feasibility for the service.

#### Description of the Organization

Ohio Valley Medical Center is a 453-bed acute care hospital in Wheeling, West Virginia. The hospital is centrally located in the Upper Ohio Valley, a region that encompasses the northern panhandle of West Virginia, with bordering counties in the states of Ohio and Pennsylvania. The hospital was established in 1890 as Ohio Valley General Hospital and later renamed Ohio Valley Medical Center as the services grew in size and complexity. The hospital is a community-based and governed not-for-profit organization.

Ohio Valley Medical Center is owned and operated by Ohio Valley Health Services and Education, a not-for-profit holding company that operates two additional hospitals and an array of health care services. Ohio Valley Health Services and Education was formed when a loose affiliation between Ohio Valley Medical Center and two other community hospitals converted to an ownership arrangement. There is a common board for the parent organization comprised of board members from the West Virginia operations and board members from the Ohio

operations. The affiliate hospital in West Virginia is Peterson Rehabilitation Hospital and Geriatric Center, located in Wheeling. The affiliate hospital in Ohio is East Ohio Regional Hospital in Martins Ferry, Ohio.

Peterson Rehabilitative Hospital and Geriatric Center provides long-term care and rehabilitative services to the affiliate hospitals and the community. East Ohio Regional Hospital is a small community acute care facility with long-term care services on the same campus. Both hospitals support Ohio Valley Medical Center. Advanced care for the patient population of these institutions was provided at Ohio Valley Medical Center.

Ohio Valley Medical Center provides tertiary and referral based care for the affiliate hospitals and surrounding small rural hospitals. The service area includes a patient population in excess of 150,000. The major competitor for Ohio Valley Medical Center is Wheeling Hospital located in Wheeling, West Virginia. Wheeling Hospital is a mirror image of Ohio Valley Medical Center in that it provides all of the same services and is also recognized as a community based tertiary care facility. The two hospitals compete for the same referrals, patient population and services.

The physicians in the community hold privileges at both Ohio Valley Medical Center and Wheeling Hospital. The majority of the physician community is in private practice. Patients are admitted to the hospital that they wish to be admitted to. The choice of hospitals is a joint effort between the physician and the patient based on where they will receive the best care. The cardiologists and internists provide patient care at both hospitals. Both hospitals care for a variety of patients in the region.

The patient population mix for the region is fifty-five percent Medicare, twenty-five percent

managed care, fifteen percent Medicaid and five percent self pay or commercial fee-for-service insurance. Insurers in the region recognize Ohio Valley Medical Center as a provider of tertiary care. Patients are not restricted to a closed panel of physicians or a certain hospital. The only restrictions come in managed care referrals outside the community to large metropolitan hospitals in Pittsburgh, Cleveland, Columbus and the University Hospital in Morgantown.

One of Ohio Valley Medical Center's most respected specialty services was cardiac care. The hospital has long been recognized for its leadership in the prevention, evaluation and treatment of cardiac diseases. The specialty nature of cardiac care, the physician staff component and the internal medicine resident training program have solidified this hospital as a referral base for such a patient population. The addition of invasive cardiology was required to close the continuum of care.

#### Description of the Unit

Cardiac care at Ohio Valley Medical Center was all encompassing and ranged from prevention to evaluation to treatment. One component of cardiac care missing from the continuum, was open-heart surgery and coronary angioplasty. A successful cardiac care program at Ohio Valley Medical Center required the addition of invasive cardiology. The patient population deserved a continuum of cardiac care and the physicians required the invasive cardiology program to provide quality care.

Cardiac care begins with prevention and outreach. This is provided to the community through educational programs and disease related screenings. The physician community assists in this endeavor and works hand in hand with the hospital. Even though prevention and outreach are the goals of the twenty-first century health care facility, evaluation and treatment of the disease

entity must also be available.

Evaluation and treatment of cardiovascular disease begins in the hospital emergency room. The hospital employs specially trained physicians and support staff to evaluate and treat patients in the emergency room with cardiovascular disease. A specialty room was designed in the emergency room of Ohio Valley Medical Center for these patients. The Chest Pain Center was a designated area of the emergency department specifically designed for the diagnosis and treatment of patients with cardiac symptoms. The emergency room has also become a leader in the community for rapid diagnostic and treatment of cardiac disease with participation in nationally recognized early interventional anti-thrombolytic therapy.

The hospital supports a full line of diagnostic cardiac services, both invasive and non-invasive in nature. The diagnostic services range from the basic electrocardiogram, cardiac stress test and echocardiogram to the most invasive procedures of cardiac catheterization and angiography. The hospital has financially committed resources to dedicated areas for coronary care, coronary diagnostics and treatment. These areas and service centers are complete with the most up-to-date diagnostic and treatment available in a community setting.

The final stage of coronary care comes with a fully accredited cardiac rehabilitation program. The programs are as intense as a phase I inpatient program to a phase IV maintenance program. To augment these programs and support prevention and outreach, the hospital developed a wellness outreach and exercise program supported by the hospital owned and operated athletic/wellness center. These programs not only assist in strength and maintenance, but also in prevention and education.

### Research Goals and Objectives

The missing component from cardiac care at Ohio Valley Medical Center and for the community was open heart surgery and coronary angioplasty. The financial viability of the hospital and the health care system in the Upper Ohio Valley was based on a continuum of care. Transferring patients to large metropolitan hospitals outside the state of West Virginia or University based hospitals in the state, created a financial hardship for Ohio Valley Medical Center in lost revenue. Transferring patients also created a financial and emotional hardship for the patient and their family.

The need and financial viability for an open heart surgery program has been proven without a doubt. The granting of a certificate of need to develop and maintain a highly specialized program was dependant on the fulfillment of a need for the patient population served and the financial viability of the program. The viability of the program should not place a strain on the health care system of the region. The development of an invasive cardiology program meets the needs of the patient population and the medical community.

### Background of the Business Problem

The patient population of the Upper Ohio Valley was predominantly elderly and indigent. The area had fallen on hard times and, what was once a thriving region for steel and coal had been relegated to a population supported by retirement services, service industry positions and federal/state subsidized programs. The heart disease mortality rate in the region was 458.2 deaths per 100,000 as compared to a national rate of 312.3 deaths per 100,000 as reported in both federal and state statistics. The data further confirmed that heart disease mortality rate for the

northern panhandle of West Virginia and the eastern counties of Ohio were as high as thirty-eight percent above the national average.

Ohio Valley Medical Center must be granted permission by the state of West Virginia to provide open-heart surgery and invasive cardiology services. This would provide the patient population with documented heart disease a continuum of cardiac care in the Upper Ohio Valley. The documentation of need and the financial feasibility of the program supported the certificate of need requirements. This would also support a change in the State Health Plan to allow the region a continuum of cardiac care.

The patient population and the physicians who care for these patients have asked for the availability of open heart services in the region for many years. The hardship that was placed on the patients, their families and the loss of continuity of care only amplified the need for this service. Patients had to travel a minimum of sixty miles to the closest open heart center, which is out of the state of West Virginia. Taking the elderly and infirmed out of the familiarity of their surroundings and asking them to travel to large metropolitan areas such as Pittsburgh, Cleveland and Columbus only increases the anxiety and worsens their outcomes. The journey, coupled with the financial hardships and the psychological impact of leaving familiar surroundings, has prompted the community as a whole to request an investigation into the development of an open heart surgery program at Ohio Valley Medical Center. The hospital has proven that the development of such a program was financially feasible and would meet or exceed all quality parameters established by national accrediting bodies and the federal government.

Business Problem/Opportunity Statement

The scope of the research must include the evaluation of the true objective of the project. In following the recognized management concepts and strategies of management by objectives and/or goal-oriented management, the researcher outlined the scope of the project. The major objective of the project substantiated the development of a high quality cost effective open heart and invasive cardiology program. The addition of open heart services would permit the hospital to offer complete and effective diagnostic and treatment services for patients with cardiovascular disease not presently available in the immediate area. Proposed surgical services include cardiac revascularization, repair and replacement of coronary valves, repair of congenital defects and treatment of cardiac trauma. In addition to the surgical services, the cardiologists would provide invasive cardiac diagnostics and coronary angioplasty. The addition of open heart surgery would also support the provision of cutting edge coronary drugs to reduce morbidity and mortality.

The key objective of this project would be to provide high quality patient care services. The comprehensive program developed for the hospital in cooperation with the community, the staff physicians and cardiovascular surgeons ensured a high level of quality care and financial stability. The ability to care for the patients, previously forced to leave the area for this care, would ensure a large enough patient base that was required for a quality program. This was significant to support low morbidity, decrease mortality rates and procure financial stability. The development of this project supported the existing internal medicine resident program by providing additional experience, previously unavailable in the hospital. The presence of an open heart surgery program and invasive cardiology department bolstered the education of the internal medicine and family practice residents who had to travel to other learning centers for that



experience. Since coronary bypass surgery and coronary angioplasty are among the most commonly performed procedures in the United States with over 200,000 procedures performed annually, that experience would enhance the education of the residents with their involvement in the care of that patient population.

The ability to foster economic development in the region was also crucial. The researcher proved, through state documents, that as many as four hundred and sixty patients left the region annually to undergo open heart surgery procedures. These numbers provide for a unit that would perform greater than one case per day. Conservatively, this accounted for at least five million dollars in lost revenue for the region. This figure did not include the additional financial outlay by the families for travel, food and lodging that they would not experience if the services were available in the region. The proposed project represented not only an opportunity to retain these health care dollars in the state, but to also attract additional dollars from the neighboring states of Ohio and Pennsylvania.

The scope of the research proved that the objectives for the program could be met and would provide a financially stable, high quality program. It also proved that the addition of invasive cardiac services was paramount to the survival of existing cardiac services. It also assured improved mortality outcomes and cardiac care for the patient population in the Upper Ohio Valley. Since the services would be available to all residents in the service area, access to comprehensive cardiac care services was improved.

The study population included residents in the counties of Ohio, Brooke, Marshall and Wetzel in West Virginia. It also included residents from Belmont, Monroe, Harrison and Jefferson counties in the state of Ohio. The counties represented the patient population who obtained

tertiary and specialty care at Ohio Valley Medical Center. Physicians in these communities utilized the hospital and specialty care staff physicians as a major referral center.

The researcher looked at two integral components of the project. The components included a need methodology and financial feasibility study. The researcher utilized data provided by both state and federal agencies to determine need and utilized both federal and internal financial data to support feasibility. The researcher utilized all data available for the need methodology and financial feasibility studies to ensure the program was indeed viable. Open heart surgery was no longer a mystical high tech procedure that must be relegated only to university settings. The researcher proved that demographic data on the patient population of the Upper Ohio Valley supported an open heart surgery and invasive cardiology program at Ohio Valley Medical Center. Lastly, the study proved that the program would bring financial stability to the hospital and the region and would not place an additional burden on the patients, their families and the insurers.

#### Scope and Limitation

The development of open heart surgery and coronary angioplasty programs in community hospitals had become more common place. Heart disease was the number one killer in the United States in the year 2000. The development of a cardiac continuum of care was paramount to the survival of a hospital and the patient population it served. The documentation of need and financial feasibility was also paramount to any hospital that desired to initiate a program.

The hospital must first determine need. The need methodology utilized by the researcher could be easily duplicated in any part of the country. The financial feasibility was determined by reimbursement that again can be duplicated, based on patient and payer mix. The limitations of

the study were based on the hospital patient base and mission. If the need methodology and/or financial feasibility could not be met the hospital should not abandon the continuum of care. Alternate means and models could be developed to provide the continuum. Those models could range from affiliation agreements to preferred transfer policies protecting the integrity of patient care.

### Conclusion

The researcher had proven that the continuum of cardiac care was best for the patients, the hospital, the medical staff and families. The need existed and was proven by the methodology utilizing real patient data. The financial feasibility showed the program would survive, support the infrastructure of the hospital and place no additional financial burden on the regional health care system. Quality programs were documented by clinical outcomes. The clinical support of a quality program comes with competent well trained staff and adequate numbers of patient to sustain the competency. The researcher determined the need for the hospital to proceed with an application for a certificate of need, which along with the support of the community, the medical staff and regional legislatures should secure the changes needed in the State Health Plan to effect the development of the open heart and invasive coronary angioplasty program.

## Chapter 2: Literature Review

The researcher followed goal oriented management to ensure a quality, financially stable program. Goal oriented management or management by objectives is a stable, well-respected concept in the service industry. No organization can exist without fundamental beliefs and the need to achieve objectives. It is crucial that all management concepts aid in the development and execution of planning, controlling, organizing, staffing and leading.

Peter F. Drucker gave form to the concept of management by objectives in his 1954 document, The Practice of Management. He suggested that future managers would be held accountable for results rather than for the pattern of human relations within their organization. Drucker was responsible for the premise of management by objectives that are; "the clearer of the idea of what one wants to accomplish the greater the chances of accomplishing it" and "real progress can only be measured in relation to what one is trying to make progress toward" (MBO Goes to Work in the Public Sector, 1973).

The development of an open heart surgery and invasive coronary angioplasty program must follow that format. The development of the program must follow an orderly process. The planning and development phase was part of the need methodology and financial feasibility undertaken by the researcher in this document. The objective of the program was to develop a strong cost effective quality program to support the community.

In the mid sixties George Ordione and J.W. Humble published written text to further support management by objectives. George Ordione was from the United States and J.W. Humble was from London. They utilized their knowledge and diverse backgrounds to further their concepts

and beliefs in their respective countries. Both of these authors helped develop the climate for management by objectives that was prevalent in all industry. Because it was process oriented, management by objectives could be implemented in all types of administrations and organizations.

The business environment is a compilation of highly educated individuals and, in order to maximize the knowledge and skills of these individuals, the organization must be able to maximize performance through motivation and reward systems. This again was a basic concept that has its roots in management by objectives. Although management by objectives is a global concept, two different types can be seen in practice today. In the United States, management by objectives is centered around the motivation of the individual employee or concept. The individual is a part of the whole and therefore meets the needs of the organization. The motivation of the hospital is both to service the community and preserve financial stability. Ordione stressed that managers of an organization jointly define common goals, define each individual's major areas of responsibility in terms of the results expected of them and use these measures as guides for operating the unit and assessing the contribution of each of its members. In Great Britain, management by objectives emphasized corporate planning. Humble described management by objectives as a dynamic system that integrated the company's need to achieve its goals for profit and growth, with the manager's need to contribute to those goals. The hospital as a corporation had planned for the development of the program and insured the plan would succeed. This second type of management is outcome oriented. The priority is placed on defining organizational objectives and then communicating those objectives to the employees of

the organization. In securing need and financial viability for the cardiology program the objectives would be met and the employees would support the objectives.

Whichever form of management by objectives and /or combination of both was totally dependant on the needs of the organization and the belief in its success. Companies around the world continue to utilize all or part of the concept. The concept can be used to increase profits, lower expenses, motivate employees and achieve both short and long term goals. The hospital would benefit from following this concept in the development of the invasive cardiac program.

Ohio Valley Medical Center was a service organization. Service organizations, by their nature, are governed by the welfare and interest of their clients. A service organization is developed to provide a segment of the community with a need that no other organization can fulfill. A service organization does not manufacture a product. Its existence is affected by the perception of the client and how the organization provides for the needs in a quality manner. Simply said, to "service the needs" of the client in a manner that no other organization can, fulfills the mission of the organization and supports the need for specialized programs.

Ohio Valley Medical Center, like any other hospital in the United States, must provide a quality service to exist. A service is usually defined by objectives. In order to achieve the organization's objectives, a management concept must be adopted. Most hospitals achieve their objectives through a centralized concept called a mission statement. The manner, in which the objectives are achieved and the mission statement is supported, can be traced back to one or both of the longstanding concepts of management by objectives. The objectives compose the mission and the means under which the mission is achieved. These can either be adopted as an

organizational concept or fractionalized into departments to meet the needs of the management staff.

To meet the needs of the patient population, objectives were identified and were carried out under the guidance of the mission statement. Program goals/objectives were developed to meet the needs of the patient population without causing harm to the organization. The mission statement of Ohio Valley Medical Center was: "the medical staff and employees of Ohio Valley Medical Center are committed to providing high quality, cost effective care to promote the health and well being of those living in our community" (Ohio Valley Medical Center Strategic Plan, 1998). The documentation of the need for a specialty program such as open heart surgery and invasive coronary angioplasty along with the financial viability of the program supported the hospital's mission statement. To achieve this objective all programs developed and all services provided must withstand the test of the mission statement.

When management by objectives is properly introduced, it is a highly motivational tool, especially if objectives are clearly set by the management team. Conversely, management by objectives can be demoralizing if they are set forth without input and support. The input from the community through the board of directors, the medical staff and the patients supported the motivation to proceed with a program. Motivation refers to the skills utilized by the management staff to arouse enthusiasm to achieve the goals or objectives of the organization (Mali, 1972). Before the management staff can motivate, the leaders of the organization must be motivated by the constituents. The proof of need and financial viability of a program with the support of the community, assists in the overall success of the program. It is the actions of the management staff that inspire, encourage and impel individuals to achieve the goal. This can

only lead to the success of the overall mission statement of the organization. Motivation should be planned and well thought out so as not to counter the productivity of the program.

Additionally, motivation must be fair and organization wide so as not to cause dissention. The concept of quality indicators and the development of quality improvement teams by the hospital, accrediting bodies and the federal government build upon the basic concepts of management by objectives. The overall involvement of teams and the objectives set and met are basic concepts rooted in management by objectives and come from some of the early teachings of Drucker. Team building is crucial. Individuals will participate in objectives because they want to and it is the leader's skill that influences the commitment. The development of a program is rooted in team development and participation. The researcher can prove the need, but the organization must come together as a team to carry out the mission.

An additional component of management by objectives is planning. Successful planning is based on maximizing opportunities. Planning is a thought process and mechanism by which the managers process from the thinking phase to the doing phase of management. Management by objectives is a system of planning from senior management to mid-level management and the process of doing so motivates all concerned.

The implementation of management by objectives is a strategy in itself. It is designed to get results while satisfying its employees and clients. The objective and /or goal of any organization is to close the loop. To plan, implement and motivate are only a portion of the greater good that this type of management can instill on the organization. For instance, the hospital needs to coordinate the contributions of their employees, both professional and technical, along with equipment to meet the needs of the organization and ultimately their patients.



Management by objectives first appeared in literature as a way to build teamwork. As Peter Drucker has said in many of his references, "teamwork leads to the performance of objectives, which in turn leads to the objectives of the business as a whole" (The Practice of Management, 1954). All businesses employ this theory, whether in part or in whole, as a management practice. Team work would need to be utilized to develop the invasive cardiology program.

One of the benefits an organization achieves from this management style is improved management function. Because targets are better defined, managers are better able to achieve their goals and the goals of the organization. Employees are much more satisfied with their outcomes and there is no uncertainty in expectations. The involvement of personal commitment and the personal profit it instills in each and every employee leads to harmony and greater motivational bliss.

O'dell has said that every business decision is a prediction (O'dell, 1968). These predictions can be arranged in such a way to become reality with the goals and objectives obtainable with the guidance of senior management, the implementation of middle management and the motivation of the subordinates. Employees must be motivated to conduct themselves in a manner that will elicit client satisfaction. The perception of excellence is as meaningful as the actual performance. Human involvement plays such a large role in all service organizations and the interaction between the client and the employee must be at a constant level at all times.

Both Douglas McGregor and Victor H. Vroom viewed management by objectives as participatory management. McGregor in his "theory Y" described that motivation and participation bring about a means to the end. No longer do we need to use punishment to meet our needs (McGregor, 1960). McGregor was a human relations theorist and believed that

employees could be motivated to organizational objectives if their ego was satisfied. Vroom presented two additional viewpoints of participation. The employee participates in provision of services through decision-making that either affects him/her directly and or is a direct result of decisions that he/she has been involved in (Ordione, 1965). This meets the needs of the two types of employees who are most commonly found in today's workforce. The independent employee functions better when involved in the decision making process, while the dependant employee functions best when the decisions are made for them but directly affects the outcome that they were motivated to achieve. Both employees function best with strong orientation to the organization's goals, coupled with enthusiasm and motivation via ample rewards.

Management by objectives is a system of management that encompasses trust, candor and openness. W. J. Reddin, a behavioral scientist, stressed the concept of effectiveness by management based heavily on teams. The utilization of teams to produce successful outcomes was widely used in hospitals' quality improvement programs. Behavioral science and/or the ability to motivate, produce participatory management, team building and goal oriented outcomes is the basic concept of management by objectives (Reddin, 1971).

Management by objectives is a powerful management tool. Peter F. Drucker popularized the notion in the early 1950 era of management. George Ordione and John Humble are two names that are most readily associated with the concept but other authors have expounded on this style of management. The style has been so readily accepted around the world because it is so versatile and diverse. The style is all encompassing and can be modified to meet the needs of any type of organization, most notably in the service industry.

Management by objectives is the communication link between senior management, mid level managers and their subordinates. It delineates goals and provides direction for all personnel involved. Participation and commitment accomplish the goals and provide for a measure of results. In the service industry where results are so often difficult to measure, management by objectives gives a means of correlation between the results and satisfaction.

Management by objectives can produce remarkable results if implemented properly. Many organizations have embraced the concept and reaped the benefits. Organizations that have not fully understood the concept and/or did not support it have failed. The participation and orientation of this management concept must be undertaken by the entire organization. Orientation is crucial to the success of the concept.

The clinical data to support open heart surgery and invasive cardiology programs in community based hospitals was overwhelming. Open heart surgery was no longer the mystical high tech procedure. Technical advances in instrumentation, medications and personnel have provided for the safety required to implement such a program in a community hospital. In an article published in the American Journal of Medicine (June 15, 2000) the authors reviewed mortality rates in rural and urban hospitals performing open heart surgery and coronary angioplasty. The study revealed that mortality rates are affected by volume of procedures and not by location of the program. Urban and rural hospitals performing these procedures had the same success as university and large metropolitan hospitals when the volume of procedures exceeded 200 cases per year, which is the minimum case load recommended by the American College of Cardiology (Maynard, June 2000).

The volume of cases related to quality was also reviewed in Annals of Thoracic Surgery

(January, 2000). The number of cases performed by each surgeon and the number of cases performed at a specific hospital showed minimum volumes must be obtained for quality programs and ongoing proficiency. The volume of cases done at a specific hospital was not always a predictor of quality and low volume programs also had low mortality and morbidity rates, but a standard minimum set forth by the American College of Cardiologists was always a good predictor for proficiency.

To further support the need to develop quality community based open heart surgery programs, an article in the Annals of Thoracic Surgery (September, 2000) refuted a claim by the state Health Care Authority, that centers of excellence should be the only hospitals to provide these services. They chose university based facilities and ignored the community programs, purely based on size not quality. The task force was able to reverse the state Health Care Authority stance on centers of excellence by developing quality standards and a registry to oversee quality. This move was to protect the service providers who had developed community based quality programs and ones that could document need, but were not university or metropolitan based.

The medical journals contain voluminous articles on cardiac services and outcomes related to access of service. The famous golden hour of resuscitation has now expanded into the hospital based care for patients with acute coronary infarction. The golden hour of resuscitation is the critical time between onset of symptoms and treatment of the acute coronary event. The availability of coronary angioplasty and open heart services has proven time and again that outcomes are effected by access to this level of cardiac care. The standard of care for these patients is anti-thrombolytics, angiography, angioplasty and open heart surgery when warranted.

Patient outcomes are greatly improved when those services are readily available for the community.

The certificate of need law in the state of West Virginia is harmful to the development of new services. The certificate of need law was designed in the 1970's to contain the inflation of health care costs by "rationing" medical services. The law, even though well intentioned has been harmful to the health and well being of people across the United States. In an article unrelated to open heart services, but none the less important to reference, the authors discuss the health related issues of patients who live in states that require a certificate of need law for new services. The law does not make sense in this day and age of technology and should be repealed by all states. Many states have realized this and have made changes (Sivaram, December 1996).

In a February 19, 2001 article in The State Journal, a West Virginia newspaper, the author expounded on the harm that certificate of need laws cause for border hospitals. Ohio Valley Medical Center is a border hospital that is affected by the certificate of need law. The hospitals located in the surrounding states of Pennsylvania and Ohio do not have certificate of need laws. The inability for a border hospital to provide a service that is needed and can show financial viability is ludicrous, especially when a hospital just across the state line can provide the service any time they wish, with no state government infringement.

Since it is uncertain that Ohio Valley Medical Center will be able to change the certificate of need law, even though they have documented need and financial viability, the researcher has identified a close affiliation with another tertiary care center as an alternative. In an article in the Journal on Quality Improvement (December, 1996) the authors discussed the success of a collaborative venture between a tertiary care center and a referring hospital for cardiac care

services. The close affiliation and development of transfer protocols had improved the outcome of cardiac patients who may have been transferred to any other hospital in the service area. No affiliations agreements were in place and patients were transferred to the cardiac hospital their insurance coverage dictated.

### Chapter 3: Method

#### Statement of Purpose

Ohio Valley Medical Center is a 453 bed acute care hospital in Wheeling, West Virginia. The hospital provides tertiary and specialty care for the residents of the Upper Ohio Valley. The hospital is also noted as a referral center for many surrounding primary care hospitals. Ohio Valley Medical Center is noted as a leader in the diagnosis and treatment of cardiovascular disease. A crucial component missing from the continuum of cardiac care for the patients with coronary artery disease is open heart surgery and invasive cardiology.

#### Research Question

The researcher must prove that an open heart surgery and invasive cardiology program was a needed service in the region. The researcher must also prove that the program could be financially feasible and self-sustaining. Can the community support an open heart surgery and invasive cardiology program based on patient population and incidence of heart disease? Can the hospital afford to initiate an open heart surgery and invasive cardiology program and can the program be self sustaining?

#### Alternatives

Three alternatives existed, which although appropriate and feasible, were less than desirable for Ohio Valley Medical Center and the community. One alternative was to develop an open heart surgery and invasive cardiology program at East Ohio Regional Hospital. The hospital was part of the organization and was a licensed facility in the state of Ohio. Therefore, no certificate of need was required. The alternative would require construction of a catheterization laboratory

and the development of open heart surgery suites. It would also require additional staff and intense training of the personnel. The facility was a small community hospital that had traditionally transferred all cardiac patients to Ohio Valley Medical Center.

The second alternative was to develop a close affiliation with an open heart and invasive cardiology program outside the community. The closest program would be in Pittsburgh, Pennsylvania. This required the patient and family to travel at least sixty miles from their home. This could be accomplished, but issues such as physician compliance and insurance coverage would be concerns.

The third alternative would be to do nothing. This had been the status quo in the community for as many years as the hospital had been in existence. Although the hospital would not financially fail and the patient population would not experience any worse care than they already had, why should the hospital and the community expect this level of care in the twenty-first century. The ultimate tragedy would be if insurers decided to not fund any cardiac care in the community and require all patients be transferred immediately to a cardiac care facility.

### Criteria

Patient needs, quality care and financial viability were all criteria that drove a quality program. The identification of patient need was paramount. This was shown to be true with the need methodologies that follow. Quality care was found inclusive of patient care that met the requirements set forth by the governing body of the hospital and medical staff, the regulatory agencies and the national accrediting bodies. Financial feasibility was shown by evaluating expenses versus revenue and the impact on the community.

The development of an open heart program with invasive cardiology services at Ohio Valley



Medical Center did meet patient needs, had patient volumes to secure quality and would financially support itself. The development of an open heart program with invasive cardiology services at East Ohio Regional Hospital could be accomplished. The need methodology would be the same and would prove that there is a need for the service in the Upper Ohio Valley. East Ohio Regional Hospital also services the same patient population. Financial feasibility and quality care would be more difficult to prove. The cost of construction and the intense training of the staff would change the financial feasibility projections and could not insure quality.

The development of an affiliation could meet patient needs. Quality would be secured through close scrutiny and there would be no change in financial feasibility or viability. To do nothing, would not meet patient needs and would be a detriment to quality care. Financial feasibility and viability would be unchanged.

#### Data Collection

The researcher had collected data from recognized sources for health care services. The internal data was derived from audited financial statements and the external data was retrieved from recognized state and federal sources. Methodologies were provided by the state of West Virginia and were well recognized for the evaluation of cardiac services.

#### Data Collection Procedures

The researcher used several state and nationally recognized need methodologies to project utilization of the services in the Upper Ohio Valley. The Upper Ohio Valley is composed of the West Virginia counties of Ohio, Brooke, Marshall, Wetzel and Hancock and the state of Ohio counties of Belmont, Monroe, Harrison and Jefferson. The only Pennsylvania county to be used

in this methodology was Washington County. Washington County is the only border county in the state of Pennsylvania that is recognized as part of the hospital's service area.

The West Virginia state Health Care Cost Review Authority provides a traditional ten-ten service area need methodology for services in Ohio County, West Virginia. The definition of a ten-ten service area is provided by the state agency and is described in detail. Ohio Valley Medical Center must provide at least 10% of the specialized care to at least 10% of the patient population of the adjoining counties. The traditional counties that are counted within the ten-ten need methodology would be Ohio, Brooke, and Marshall counties. The need methodology does not speak to any counties outside of the West Virginia borders. It should be noted at this time that at least 38% of the patient population serviced by Ohio Valley Medical Center come from outside the state of West Virginia. If the researcher were to extend the traditional ten-ten need methodology to the state of Ohio, this would impact Jefferson and Belmont counties.

To complete the data retrieval for the traditional ten-ten need methodology the researcher obtained documents from the West Virginia Health Care Cost Review Authority and Ohio Valley Medical Center that contained population data, discharge data and specialized service data. To validate the traditional ten-ten need methodology provided by the West Virginia Health Care Cost Review Authority, additional need methodologies were utilized. The Health Services Administration of Southern Pennsylvania need methodology was an additional need methodology based on 1990 census data for admission rates and base year population. The equation utilizes base year population, percentage of total population times the admission rate that would equal the weighted rate. This data was then carried on to another equation that utilized service and population times the weighted average admission rate to equal projected

admissions. Projected admissions were then multiplied by the expected percentage of cardiovascular patients to equal the projected number of cardiovascular procedures. This number was further multiplied by the expected percentage of cardiac catheterizations as taken from the methodology equation that would equal the expected cardiac catheterization procedures per year. Lastly, the expected cardiac catheterization procedures per year were multiplied by the expected percentage of cardiac surgery cases to equal the final number of projected cardiac surgery cases per year. These equations and projections are more fully defined and documented in chapter 4. The methodology calls for a low range and a high range.

The 1998 National Hospital Discharge survey of direct heart revascularizations included diagnostic related groups (DRG) 106 and 107, which further validated prospective open heart procedures for a service area population. The use rate methodology stated that 128.3 patients per 100,000 service area population were expected to undergo direct heart revascularization in the DRGs of 106 and 107. DRG 106 was defined as a coronary bypass graft with cardiac catheterization and DRG 107 was defined as a coronary bypass graft without catheterization. Utilizing total population derived from earlier statistical data used in the two previous methodologies, a ratio of 128.3 to 100,000 equaled the documented patient population to the expected procedure rate. To further confirm the volume of open heart procedures, cardiac catheterization data from the Wheeling community was used in the equation. Total cardiac catheterizations performed in the Wheeling community times the expected percentage of cardiac surgery based on the Health Services Administration of Southern Pennsylvania need methodology data provided the total expected open heart procedures for the Wheeling community.

To further validate all previous need methodologies utilized to determine expected open heart surgery procedures and the expected patient population, the researcher obtained documented historical data from similar institutions in the state of West Virginia. Based on 1998 data submitted to the West Virginia Health Care Cost Review Authority, the following relationship between diagnostic catheterization, coronary angioplasty, and open heart surgery could be demonstrated. Utilizing the data from Charleston Area Medical Center, Monongalia General Hospital, St. Mary's Hospital and West Virginia University Hospital, the expected correlation between diagnostic and therapeutic catheterizations showed that open heart surgery demand was approximately 44%. Further information would imply that the demand for cardiac angioplasty was 39% of the volume of diagnostic catheterizations, while open heart surgery demand was shown to be 44%. This data can be further extrapolated and utilized in percentage equations based on the documented historical data of diagnostic cardiac catheterizations in the Wheeling community.

The second portion of the hypothesis to be determined was the financial feasibility of an open heart surgery program. The researcher based the financial feasibility studies on the following data. Net patient service revenue was forecasted utilizing the following number of incremental admissions. At the inception of the open heart surgery program it was estimated that 100 open heart surgery procedures would be performed annually. It was anticipated that in each subsequent year, the number of open heart surgical procedures would increase.

Approximately 25% of the procedures were projected to be in DRGs 104 and 105. These procedures involved cardiac valve procedures, with and without coronary catheterization. It was determined that cardiac valve procedures were not as prevalent in the general patient population.

The remaining 75% of the procedures were projected as DRGs 106 and 107, which were coronary bypass, with and without coronary catheterization.

Based on the historical payer mix and age specific procedure data, the researcher showed that 90% of all procedures were performed on Medicare patients and 10% of the procedures would be performed on patients with other payer sources. Net Medicare patient service revenues were calculated using DRG rates for 1998. The net patient service revenues include capital, disproportionate share and indirect medical education amounts. No outlier reimbursements were projected. Net patient service revenue for the 10% of the patients in the "all other categories" were also calculated at the net Medicare DRG rate. The net amount calculated for the "all other categories" historically added to the net revenue realized for patients in this population.

As the projected patient volumes represented incremental revenue for Ohio Valley Medical Center, no charge increases were projected as a result of the project. For analytical purposes, net revenue did not include any inflationary increases. Similarly, all expenses were forecasted in constant dollars. Salary expenses in the projection represented initial training costs in the first year of implementation. No incremental salary expenses were projected for nursing or ancillary service areas. Sufficient capacity existed to accommodate the projected patient volumes. These areas included the operating room, recovery room, critical care nursing areas, respiratory and physical therapy, including cardiac rehab.

Perfusionists and perfusion management would be provided by an independent contractor. These rates were based on a per case basis. Fees for perfusion and perfusion management were \$1,200 per case. Once 38 procedures were performed per quarter, the rate would be reduced to \$885.00 per case.

The operating rooms at Ohio Valley Medical Center rebuilt in 1980 were originally designed and built to accommodate open heart surgery. No construction or renovation was required. No depreciation expense was projected. However, there were equipment requirements for open heart surgery. The contract perfusion and perfusion management service would provide equipment and charge a per case rental fee. The initial cost per case of \$410.00 would be reduced to \$290.00 per case if volume exceeded 38 procedures per quarter. Expenses for the first and second year were projected at \$410.00 per case; expenses for the third and fourth year were projected at \$290.00 per case. These expenses were included in the purchased services, rent, repairs and utility line in the attached forecast. Perfusion and perfusion management services would be the responsible party for equipment obsolescence and maintenance. This would incur no depreciation and/or maintenance costs in the project.

Perfusion and perfusion management services would provide the required supplies, including heart valves. The basic supplies would be included in the "open heart kit" with a price of \$1,242.00 per procedure. Valves would be provided at a cost plus 30%. Perfusion and perfusion management quoted a list price range of \$3,000 to \$4,000 per valve. Valve costs were projected at \$5,200.00 per case based on DRGs 104 and 105. As the perfusion and perfusion management service would maintain the inventory of heart valves at their expense, no inventory cost would be forecasted.

Pharmacy expenses were forecasted using the current average expense per case of \$262.15, adjusted upward by the average projected DRG weight of 5.4. Average pharmacy costs were projected at \$1,415.61 per case. Pharmacy expenses were included in supply expenses in the attached forecast.

The cost of the program Medical Director was projected at \$50,000.00 per year. This was listed in the professional fees expense line item. The Medical Director would be an independent practitioner who would bill for service for any procedure and/or clinical evaluation performed. Additionally, \$200,000.00 would be allotted for anesthesiology expenses, which was also listed in the professional fee expense line item.

#### Analytical Tools and Tests

The utilization of recognized need methodologies set forth by the state of West Virginia ensured the results were able to be duplicated and were valid. Financial data from the federal government insured a uniform cost reimbursement method that could be duplicated in any state in the United States. Decision Matrix Tables were detailed in chapter 4 utilizing the data retrieved from the need methodologies and financial documents from the hospital and government agencies.

#### Conclusion

The researcher has identified appropriate need methodologies and financial feasibility models to determine the success of the program. The need methodologies and financial feasibility studies will be included in chapter 4 and detailed in the tables. In addition, the researcher has identified potential alternatives to the proposed program. These alternatives, although feasible are found not to be ideal to afford the patient population a continuum of cardiac care.

## Chapter 4: Results and Analysis

Findings

Ohio Valley Medical Center proposed to establish an open heart program with invasive cardiac catheterization capabilities. The program would be lead by a board certified cardiothoracic surgeon with special qualifications in cardiac surgery. The medical director would assist in selection, training and establishment of a program that met the highest standards set forth by the American College of Cardiology and the American Heart Association. These standards were established in 1991 and were the only recognized standards at the time the researcher completed the study.

The objective of the project was to provide complete diagnostic and treatment facilities for the patient with cardiac disease. The addition of open heart surgery services would provide the patient population with services not presently available in the Wheeling area. Surgical services would include cardiac revascularization, repair and replacement of heart valves and treatment of cardiac trauma. The existence of open heart surgery services would provide back up for other cardiac services that include coronary angioplasty, interventional cardiac mapping and the administration of cutting edge pharmaceuticals.

The provision of advanced cardiac services in the Wheeling area was needed due to the high incidence of cardiac disease. This was supported by the heart disease mortality rate figures. The Wheeling area had a rate of 458.2 deaths per 100,000 as compared to the average national rate of 312.3 deaths per 100,000 population. To further amplify the incidence of cardiac mortality,



county data for both Ohio County in West Virginia and Belmont County in Ohio were as much as 38% higher than the state average.

The West Virginia State Health Care Planning Commission, along with the lay press, reported that nearly 35% of the deaths in 1998 were attributed to heart disease and that West Virginia ranked the highest in the nation for deaths related to heart disease. Correlating the supporting data showed that the mean age of residents in West Virginia was the oldest in the nation with nearly 15% of the population being 65 years of age or older as compared to the national average of 12%. This further supported the need for a continuum of cardiac care. This also supported the researcher's utilization of Medicare reimbursement data.

Financial stability for the hospital and economic development were important reasons to proceed with the project. Based on patient transfer data at least 460 open heart surgery cases left the Wheeling area for their care. Conservatively, this was at least \$5,000,000 per year in revenue that left the state in the form of health care dollars. This did not include the financial burden that was placed on the families in the form of transportation, food and lodging costs when they must accompany their loved one to another city. The project not only represented an opportunity to retain revenue and jobs in West Virginia, but to also attract those dollars from the border states of Ohio and Pennsylvania.

The data used in the need methodology was extracted from state cost reports, internal hospital reports and data received from the West Virginia Health Care Cost Review Authority. 1990 Census data for the eight counties surrounding Wheeling, West Virginia was used. The 1990 census data was the most recent confirmed data available. The state of West Virginia was still refusing census data collected for the year 2000. This was consistent with the population data

used by the Health Care Cost Review Authority and the hospital cost reports for referral based populations. The four counties in West Virginia were Brooke, Marshall, Ohio and Wetzel for a population total of 134,477. The four counties in the state of Ohio were Belmont, Harrison, Jefferson and Monroe for a population total of 177,653.

The use rate methodology for direct myocardial revascularization was noted in the 1998 publication of the National Hospital Discharge Survey. The publication listed 128.3 direct myocardial revascularizations procedures per 100,000 population. Utilizing census data for the Wheeling area patient population referral base, one can extract the following as illustrated in Table 1.

**Table 1**

**Annual Expected Procedures Per 100,000 People**

	West Virginia	Ohio	Totals
Population	134,477	177,653	312,130
Expected Procedures	172	227	399

To support this methodology, the diagnostic cardiac catheterization data for the Wheeling area in 1999 was 1,200 diagnostic procedures. The American College of Cardiology conservatively estimates that at least 30% of diagnostic catheterizations resulted in invasive procedures. This would correlate to 360 procedures, which further supports this use rate, as illustrated in Table 2.

**Table 2**  
**1999 Cardiac Catheterization Experience**

# Cardiac Catheterizations	1200
% expected to be invasive	30%
# Open heart surgeries	360

The recognized Southern Pennsylvania Methodology Admission Rate could also be used to support the need for invasive cardiac services in the Wheeling, West Virginia. Utilizing 1990 census data for the states of West Virginia and Ohio the following expectations were derived.

Table 3 shows 1990 census data and documented admissions for West Virginia and Ohio hospitals in 1990. This provided an expected admission rate per 1,000 people.

**Table 3**  
**Rate of Admissions Per 1,000 People**

State	Population	Admissions	Rate/1000
West Virginia	2,040,643	406,640	199.3
Ohio	10,743,946	1,812,839	168.73

Table 4 shows 1990 census data for Ohio Valley Medical Center service area in West Virginia and Ohio. That percentage was then multiplied by the admission rate per thousand calculated in the table above to provide a weighted admission rate.

**Table 4**  
**Weighted Admission Rate**  
**OVMC Service Area**

Service Area	Base Year Population	% of Total	Admission Rate	Weighted Rate
West Virginia	134,477	43.1 x	199.33 =	85.91
Ohio	177,653	56.9 x	168.73 =	96.0
<b>Total</b>	<b>312,130</b>			<b>181.91</b>

The service area population for West Virginia and Ohio was added together and a percentage was calculated based on the individual state's service area against the total service area population. Utilizing information in the Table 4, the service area population times the weighted admission rate provided projected admissions.

**Table 5**  
**Projected Cardiac Surgeries Per Year**

	National Projection	State Projection
S e r v i c e   A r e a   P o p u l a t i o n	312,130	312,130
T i m e s   W e i g h t e d   A d m i s s i o n   R a t e	181.91	181.91
Projected Admissions	58,280	58,280
P e r c e n t a g e   C a r d i o v a s c u l a r   P a t i e n t s	5.5%	5.5%
Projected Cardiovascular Patients	3,205	3,205
Expected Percentage of Cardiac Catheterizations	30%	40%
Expected Cardiac Catheterizations Per Year	961	1281
Expected Percentage of Cardiac Surgery Procedures	30%	44%
Projected Cardiac Surgery Cases Per Year	288	564

According to Health Services Administration of Southern Pennsylvania need methodology, 5.5% of all hospital admissions had a cardiovascular diagnosis. The projected admissions were multiplied by 5.5% providing a projected cardiovascular patient volume. According to the American College of Cardiology, 30% of the patients with cardiovascular diagnoses undergo cardiac catheterization. Thirty per cent of those having catheterization proceed to cardiac surgery. This need methodology rate was conservative in nature and shows a percentage of procedures at a lower rate than what was reported by hospitals in West Virginia. Their rates were closer to 40% of the population requiring catheterization and 44% of those patients required invasive procedures.

Based on these use rate methodologies, the program would support itself with sufficient numbers of patients to provide clinical and financial stability to the program. To determine financial feasibility the program would undergo a four year implementation plan using the following number of incremental procedures performed.

**Table 6**  
**Procedure Volumes For Years 1 - 4**

	Year 1	Year 2	Year 3	Year 4
Procedures Performed	100	150	200	250

Utilizing national data for comparison, 25% of all cardiac procedures were categorized in the Diagnostic Related Groups 104 and 105, which include cardiac valve procedures. The remaining 75% were categorized in the Diagnostic Related Groups 106 and 107, which included cardiac revascularization procedures. Based on age of onset for cardiac disease and payer classifications, it was noted that nearly 90% of the patients would be Medicare reimbursable and only 10% included all other payers. To simplify the financial data all reimbursement was factored at the present Medicare reimbursement rate, as illustrated in Table 7. Additionally, no outliers were factored into this data.

Table 7

## Statement of Revenue Detail

## Ohio Valley Medical Center, Inc.

DRG	Medicare Payment	Volumes Years 1-4	Percent of Medicare	Year 1 Revenue	Year 2 Revenue	Year 3 Revenue	Year 4 Revenue
104	\$ 29,236	12.5/18.75/25/31.25	100 %	\$365,451	\$548,177	\$730,902	\$913,628
105	22,127	12.5/18.75/25/31.25	100%	276,594	414,890	553,187	691,484
106	21,496	37.5/56.25/75/93.75	100%	806,104	1,209,156	1,612,208	2,015,260
107	16,233	37.5/56.25/75/93.75	100%	608,773	913,159	1,217,546	1,521,932
		100/150/200/250		2,056,922	3,085,382	4,113,843	5,142,304

No renovation expenses were required, for the operating rooms were rebuilt to accommodate heart surgery and a cardiac catheterization laboratory which already existed. Salary expenses should not change, for no additional staff would be required. Training costs and professional purchased services were factored into this feasibility study utilized proposals presently in place for these services. These costs included Perfusionists and Anesthesia services, as illustrated in Table 8.

Table 8

## Statement of Expense Detail

## Ohio Valley Medical Center, Inc.

	Year 1	Year 2	Year 3	Year 4
Perfusion management \$1,200/885 Per Case	\$ 120,000	\$ 180,000	\$ 177,000	\$ 221,250
Capital \$410/290 Per Case	41,000	61,500	58,000	72,500
<b>Total Purchase Services/Rental Expense</b>	<b>\$ 161,000</b>	<b>\$ 241,500</b>	<b>\$ 235,000</b>	<b>\$ 293,750</b>
Heart Valves \$5,200/Case	\$ 130,000	\$ 195,000	\$ 260,000	\$ 325,000
Supplies (Kits @ \$1,242/Case)	124,200	186,300	248,400	310,500
Pharmacy (\$1,115.61/Case)	141,561	212,341	283,122	353,902
<b>Total Supply Expense</b>	<b>\$ 395,761</b>	<b>\$ 593,641</b>	<b>\$ 791,522</b>	<b>\$ 989,402</b>
Professional Fees-Medical Director	\$ 50,000	\$ 50,000	\$ 50,000	\$ 50,000
Anesthesia	200,000	200,000	200,000	200,000
<b>Total Professional Services</b>	<b>\$ 250,000</b>	<b>\$ 250,000</b>	<b>\$ 250,000</b>	<b>\$ 250,000</b>
Training/salaries	\$ 50,000	\$ 0	\$ 0	\$ 0
Current cost drugs/discharge	\$ 262.15			
X weighted CMI for DRG's 104-107				
.25 ((7.7521 + 5.8291)/2)	X 5.4			
+.75 ((5.6583 + 4.2348)/2)				
<b>Drug Cost /Case</b>	<b>\$ 1,415.61</b>			



Analysis of financial data demonstrated that revenue shall exceed expenses in each incremental year of program development, as demonstrated in Table 9.

**Table 9**  
**Summary of Revenues and Expenses**  
**Ohio Valley Medical Center, Inc.**

	Year 1	Year 2	Year 3	Year 4
<b>Total Patient Service Revenue</b>	<b>\$2,056,922</b>	<b>\$3,085,382</b>	<b>\$4,113,843</b>	<b>\$5,142,304</b>
Operating Expenses:				
Salaries, Wages & Fringe Benefits	\$ 50,000			
Supplies	\$ 395,761	\$ 593,641	\$ 791,522	\$ 989,402
Professional Fees	\$ 250,000	\$ 250,000	\$ 250,000	\$ 250,000
Purchased Services (Rental, Repairs, Utilities)	\$ 161,000	\$ 241,500	\$ 235,000	\$ 293,750
<b>Total Operating Expenses</b>	<b>\$ 854,761</b>	<b>\$1,085,141</b>	<b>\$1,276,522</b>	<b>\$1,533,152</b>
Income (Loss) From Operations	\$1,202,161	\$2,000,241	\$2,837,321	\$3,609,152
<b>Excess of Revenue &amp; Gains Over Expenses</b>	<b>\$1,202,161</b>	<b>\$2,000,241</b>	<b>\$2,837,321</b>	<b>\$3,609,152</b>

In conclusion, all need methodologies supported an adequate number of procedures to ensure a quality program and further support the need for this service in the Upper Ohio Valley. These numbers were used to project financial feasibility. Additionally, the financial feasibility study

demonstrated the program would sustain itself and provide the hospital financial stability. The data developed for use in both the quality and financial feasibility studies were conservative numbers, but realistic.

Implication for the Research Question

The implications for the research showed that a community hospital that has a need and can prove that need, along with financial feasibility, should move ahead to develop a program. The hospital must also prove that quality can be met, that the mission of the organization is upheld and that the community supports the program.

## Chapter 5: Conclusion

Recommendations

The patient population of the Upper Ohio Valley should have access in the immediate area for invasive cardiology services. A community based tertiary care hospital, Ohio Valley Medical Center, has the resources and the patient base to provide a financially stable, quality invasive cardiology program. The West Virginia State Health Plan, enforced by the West Virginia Health Care Cost Review Authority, through the certificate of need laws had a provision in the Plan to allow Ohio Valley Medical Center the ability to implement an invasive cardiology program. Ohio Valley Medical Center should be permitted to come before the West Virginia Health Care Cost Review Authority to show documentation of need and financial feasibility.

The state of West Virginia, in its desire to reduce health care costs and limit access to health care services, had caused undue financial and personal hardship on the residents of the state living in the Upper Ohio Valley. The author provided evidence that an invasive cardiology program at Ohio Valley Medical Center in Wheeling, West Virginia would not only be a quality program with a sufficient number of patients, but would also be financially feasible. It would retain West Virginia's health care dollars in the state. The infrastructure, physical plant and clinical expertise already existed and would not cause undue expense to the hospital and patient population if the program was developed. Need methodologies and a financial review supported the development of a program. The addition of the program would also enhance existing programs and would ease the burden of travel for both patients and their families.

The hospital must now decide upon a strategic plan of action. The hospital could risk sanctions by the Health Care Cost Review Authority and the State Health Plan if they proceeded with a program before achieving certificate of need approval. This course of action would be risky and could jeopardize the hospital's license. The hospital could rally the support of the medical staff, patient population and state legislature and request a change in the certificate of need laws. This course of action would be time consuming and may fail due to lack of legislative support from other parts of the state of West Virginia.

The most logical course of action was for the hospital to apply for a certificate of need. This course would be time consuming and expensive. Notwithstanding, this appeared to be the only legitimate course of action the hospital could take. The hospital would need to prove the financial feasibility, quality and overall need as this author has done.

#### Implementation

Ohio Valley Medical Center must utilize the strength and expertise that its senior staff possessed. The primary principle of goal oriented management would assist the hospital's senior staff in developing the invasive cardiology program and documenting its need in a formal request to the state of West Virginia for permission to implement the program. The support of the medical staff, hospital employees, patients and legislators would play a pivotal role in the request. The planning, implementing and motivational components of goal oriented management would assist in the successful development of the program for approval.

Program development in health care is the backbone for financially stable quality care. The concepts are rooted in goal oriented management; management by objectives would always serve the senior staff of a health care institution in their desire to provide a successful program.

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