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Making the Business Case for Infusion Teams: The Purpose, People, and Process

INTRODUCTION

Over the past 65 years, many factors have influenced the development and disbandment of hospital-based infusion teams. Originally, state laws required physicians to deliver all IV infusion therapy, but the laws were changed in the early 1960s.¹ Owing to these legal changes, highly specialized and skilled nurses were needed to assume infusion responsibilities, thus driving the development of infusion teams within many US hospitals. The 1990s brought patient safety concerns associated with excessive working hours for medical interns and residents. Inserting peripheral IV catheters, troubleshooting all types of catheter problems, and giving IV medications could easily be shifted to an infusion team of skilled nurses, thus reducing the workload of these physicians.^{2,3} At the turn of the 21st century, costs and cost containment in health care became a serious issue. Business consulting companies recommended disbanding infusion teams in many hospitals as a cost-cutting measure, thus shifting all infusion responsibility to the overloaded staff nurses. Infusion teams that are established as only a cost center in the hospital accounting system may be easy targets for cost-cutting efforts, as opposed to those teams that are set up as revenue centers. Currently, the United States is in the early stages of restructuring many aspects of financing its health care system with the introduction of value-based payments and pay-for-performance programs. The impact of these changes on infusion teams is yet to be determined; however, the renewed emphasis on improving patient

outcomes and safety, such as reduction of all vascular access device and infusion-related complications and implementation of recognized standards and guidelines, could be supportive of infusion teams.

Clinical outcomes after an infusion team has been disbanded are unknown. Additionally there are very little data comparing hospitals or nursing units with and without infusion teams. Anecdotally, many infusion nurse leaders perceive an increase in infusion-related complications, compromises in patient safety, and a corresponding decrease in patient satisfaction, yet lack the personnel and resources to validate these perceptions. Anecdotal evidence or perception of these issues falls short of the data needed to prompt decision makers to financially support formation of a new infusion team, continue support for an existing team, or expand the services of an existing team.

Currently, decisions in hospital management are made with a critical focus on business aspects; specifically, how the proposed action will affect costs and revenue. The business case is a common mechanism used to answer the difficult questions about allocation of limited resources. The business case takes time and effort to create, therefore it is typically employed when a proposed change is expected to have a significant impact on the hospital's strategic plan.⁴

WHAT IS A BUSINESS CASE?

The term *business case* is used in 2 different ways; 1 focuses on the proposal and the other on the financial outcome. First, a business case is a structured proposal used by organizational decision makers to justify investment in a project such as a new service or improvement.^{4,5} This proposal contains comprehensive information with

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strong clinical data for comparison and careful financial analysis to secure the funding for the proposal.

Secondly, it can be viewed as the outcome of the decision to support the recommended service. The business case is made when the organization recognizes a financial return on the investment in a reasonable time period. A business case may also be present if decision makers believe that a positive impact on organizational function will accumulate over a reasonable time frame.⁶ Consequently, the structured proposal is required in order to obtain administration approval for the desired project and for the organization to realize the positive financial return on the investment.

The proposal includes an analysis of where the hospital currently is with the specific issues, where it wants to be regarding challenges, and the process for getting there. Clinical outcome data should be collected and analyzed. While data from published studies are helpful, data from the specific hospital provide a more precise picture of what is occurring. Specific trends for problems may include unacceptable rates of central-line associated bloodstream infection (CLABSI), regardless of many interventions already implemented. Other infusion-related complications that should be included are incidence rates or prevalence data on IV medication errors, infiltration, extravasation, phlebitis, vein thrombosis, iatrogenic pneumothorax during central venous catheter insertion, and venous air emboli associated with any type of vascular access device. Data from infusion-related incident reports and sentinel event reports should be assessed. Claims of negligence or malpractice associated with infusion therapy must be included.

The proposal should analyze national and local priorities pertaining to the project. Examples of national priorities related to infusion-associated outcomes include hospital-acquired conditions from the Centers for Medicare & Medicaid Services (CMS). The hospital cannot bill Medicare when these conditions occur, and this list now includes 4 infusion-related conditions: air emboli, blood incompatibility, vascular catheter-associated infections, and pneumothorax from central venous catheter insertion. Many other national initiatives, such as medication errors, alarm fatigue, transfusion practices, and needlestick and other sharps injuries, should be assessed.

The proposal must provide a clear understanding of exactly what is being put forward (eg, an infusion team that meets the INS definition), the scope of service for this team, the staffing mix (eg, number of RNs, LP/VNs, and other assistive personnel), purchase of new capital equipment (eg, ultrasound machines), hours of operation, and how patient needs will be met if the proposal constitutes less than 24-hour, 7-days-a-week coverage by the team.

Alternatives to the proposed infusion team should be discussed, including starting a smaller catheter insertion

team, or a team with limited hours of operation. Maintaining the status quo of staff nurses performing all infusion therapy could be 1 option; however, the issues, problems, and negative clinical outcomes already included in the proposal provide information about why these options are not the wisest choice. Financial data for each alternative should be analyzed so a clear comparison can be made. For example, improving outcomes and resolving problems with infusion therapy that is managed by staff nurses may require a substantial investment in staff development, along with processes to measure performance improvement. These ongoing costs may exceed the costs of an infusion team.

Finally, the proposed action must fit within the hospital's stated mission, vision, and strategic plans. Most strategic plans for hospitals include goals involving quality of patient care and wise financial management, goals that are thoroughly consistent with those for safe delivery of infusion therapy.

The business case will always be developed from the perspective of the organization that will be paying for the proposed innovation—a hospital, in the case of an infusion team. Nonetheless, other entities are affected by the decision about the proposed innovation.^{7,8}

Third-party payers of health care⁹ have higher costs when the length of stay is increased due to infusion-related complications. One argument against an infusion team is that decreasing length of stay will not financially benefit the hospital, as the daily rate is being charged for each day of the patient stay. Research has shown that the largest revenues for the hospital come in the early stage of hospitalization when diagnostic and therapeutic procedures are being performed. After that period, nursing care is still required, but the daily net revenue production decreases. This means that shorter hospital stays produce higher revenues while freeing the bed for another patient who would then move into an initial period of greater daily revenue generated.¹⁰ This business concept is known as *inpatient throughput*.

A case-matched cohort study of CLABSI in pediatric patients found that 10 CLABSI patients would occupy a bed for a total of 310 days and generate \$2 021 628 in net revenue. The same 310 days would allow for 14 patients without CLABSI to occupy the bed for a total of \$2 325 904 in net revenue, an increase in net revenue of \$304 276.¹⁰ For Medicare patients and billing based on the diagnosis-related group (DRG),¹¹ reducing the length of stay will decrease costs to the hospital since no additional billing per day is possible.

An additional perspective is that of the patient and society as a whole. Obviously the patient is deeply appreciative of skillful venipuncture on the first attempt, the absence of complications, and no medication errors; however, these benefits do not necessarily redound to the hospital. Many innovations may prove favorable for

the patient, but the hospital paying for that innovation will not see a financial benefit.⁷

FINANCIAL ANALYSIS FOR THE BUSINESS CASE

Financial analysis is required to make the business case for instituting, sustaining, or expanding an infusion team. This means that the group working on the business case must be knowledgeable about hospital budgeting processes and practices, revenue sources, and cost-accounting practices, or seek the assistance of those who are.

Most nursing units in hospitals are set up as cost centers, meaning they have responsibility only for controlling expenses. The nursing unit does not generate the patients admitted or control prices charged and thus has no control over the revenue brought into the hospital. A revenue center shows both costs expended and revenue generated for the hospital. Hospital units are designated as revenue centers when the services provided are used by a portion of, but not all, patients. The revenue center provides a way to measure service consumption for different patients.¹² According to Perucca, the infusion team should be established as a revenue center as well as a cost center.¹³ This structure allows for the capture of highly specialized infusion services performed only by the infusion team. Tracking and analyzing these services document the financial contributions of the infusion team, showing revenue to offset the costs.

Fees or prices for all procedures and products are established through the chargemaster system, a large computer file containing all devices and procedures generating a patient charge.¹³ The infusion nurse leader is the expert to work with the accounting and coding departments to establish the chargemaster prices for all infusion procedures and resources.¹³ Each price includes the costs of supplies, labor, overhead, and the percentage of markup used by the specific hospital. The amount of money received by the hospital in payment for all services is discounted from the chargemaster prices.

The case mix index (CMI) is a number assigned to a hospital based on the acuity of patients in that specific facility and is used to determine the hospital's payment. Hospitals with patients having more complex needs, more critical diagnoses, or more difficult surgery will have a higher number assigned and therefore receive higher payments from all payers. For instance, a community hospital may have a CMI of 1.5 or 1.6, but the CMI for an academic medical center may be 2.0. When calculating costs based on all patients in the hospital, this number will be important to know. Improvements in care, such as a reduction in CLABSI rates, may result in a decrease in the CMI and a corresponding decrease in revenue. This is an example of the

cost savings being enjoyed by the payer and not the provider of the service.¹⁴

Payment for services provided by US hospitals comes from private insurance companies, government payments from Medicare and Medicaid, and payment directly from patients without insurance. Medicare and Medicaid payments are fixed amounts based on the patient's diagnosis and represent a significant discount from the chargemaster prices. There are at least 750 types of DRGs¹³ with the amount of payment for each determined by the Inpatient Prospective Payment System (IPPS). The specific payment varies based on local and regional operational costs and salary requirements, making it necessary to ascertain specific DRG payments for each hospital for calculations in a business case. Many insurance companies have followed the government's lead by also paying a fixed fee per diagnosis or a fixed daily fee. In calculating costs for a business case proposal, the percentages of payments from each type of payer may be useful.

Costs include direct, indirect, and opportunity costs. Each hospital will have methods and processes for cost accounting to support management decisions. While the infusion nurse manager may not have in-depth knowledge of cost calculations, there is a need for a basic understanding of different types of costs. Additionally, members of the financial department can serve as resources for supplemental information and calculations regarding costs.

Direct costs include all costs for operating a specific unit of the organization, but direct costs could also be analyzed as costs of patient care. Salaries for all members of the proposed infusion team (eg, RNs, unlicensed assistive personnel, secretary), employment taxes, and benefits are direct costs. The costs for acquiring capital equipment such as ultrasounds, electrocardiography (ECG) guidance technology, and storage carts are direct costs. Other direct costs include office and storage space for the infusion team, and a communication system (eg, pagers or telephones for team members on duty) must also be included.

When calculating the costs of operation for an infusion team, the time the nurse manager spends on administrative duties (eg, budgeting, staffing) would be included; however, if the analysis is for a specific patient care activity, managers' administrative time or clerical time would not be included.¹² Costs of peripheral IV catheters and a start kit may be allocated to the nursing care unit instead of an infusion team; however, these costs must be considered when analyzing the costs of this procedure. Labor costs of the personnel performing the procedure will include salary, employer-paid taxes, and benefits. Direct costs for an infusion team should be broken down by initial start-up costs (eg, training new personnel or decreased productivity during start-up) and ongoing operational costs (eg, salaries, equipment maintenance, and performance monitoring).

Indirect costs are those that are assigned to another unit within the hospital or are costs within the specific unit but not related directly to patient care.¹² Costs for laundry or central supply services would not have an impact when considering the costs of the infusion team as a hospital department; however, some of these costs may need to be allocated when calculating the costs for a specific procedure such as insertion of a central vascular access device (CVAD).

Opportunity costs occur because an alternative use for the money was sacrificed. Money for a proposed infusion team could be spent in other ways. For instance, money could have been requested for expansion of the staff development department or new infusion pumps are needed. Anticipated revenue generated by the other proposed service or equipment would be compared to the anticipated revenue generated by the infusion team. The revenue to be generated by the infusion team would need to be greater than that anticipated from the other new service or equipment in order for the decision makers to support the infusion team. Revenue from the other new service or equipment is sacrificed because of the decision to invest in the infusion team.^{12,15}

Cost analysis involves understanding and applying related terms of cost savings and cost avoidance, also called cost aversion. In basic terms, cost savings occur when a product or service is bought for less money than previously paid. Cost savings occur for peripheral IV catheters when a change in product or the contracted purchase price results in less money spent. If the contract price for peripheral catheters decreases by 50 cents each, the purchase of 10 000 catheters would represent a savings of \$5000.

Cost avoidance/aversion refers to actions taken to reduce future costs, although the initial preventive action may be more costly than the current practices. When payment is based on a DRG for a Medicare patient, shorter length of stay means costs for additional days are avoided. Costs are avoided when a peripheral IV catheter is removed after completion of therapy without complications. When a peripheral catheter used for power injection in radiology produces an extravasation injury and subsequent compartment syndrome in a 70-year-old patient, the costs include immediate surgical fasciotomy to decompress the extremity, followed by many additional days as an inpatient and a second surgery to close the original incision on the fasciotomy. The costs of 2 surgical procedures, necessary medications (eg, antibiotics), additional hospital days, required physical therapy, and outpatient care would constitute the total costs of the complication. Medicare is paying the hospital expenses under the DRG system; however, the total payment may fall short of the actual costs for this treatment. Costs exceeding the Medicare payment, plus costs of subsequent litigation brought by the patient against the

hospital, would have been avoided if this complication had not occurred. The likelihood of the complication occurring would have been greatly decreased had the peripheral catheter been placed in a large vein of the forearm rather than a vein of the wrist, adequate catheter and joint stabilization devices used, and complete site assessment performed before the rapid injection of the contrast agent.

Other examples of cost avoidance can be found. One study of pharmacists' interventions in an emergency department documented cost avoidance of more than \$1 million during a 4-month study period and potential cost avoidance of more than \$3 million when the data were extrapolated for a 1-year period.¹⁶ Another study analyzed the costs of CLABSI in 54 patients and compared the direct and indirect costs to the amount of revenue paid to the hospital for treating these infections. In this patient group, the average payment was \$64 894, and the average cost was \$91 733, representing an average loss of \$26 839 per patient. This study documented a total loss of \$1 449 306 in all 54 patients.¹⁷ It is important to note this study was conducted before Medicare stopped payments for the complicating condition of CLABSI. Today, the financial loss would be even greater; thus, prevention of CLABSI represents a substantial example of cost avoidance.

Patient safety and patient satisfaction has taken a leading role in changing health care. Patients expect quality care from qualified professionals. Infusion therapy represents an invasive procedure performed on virtually all hospital inpatients.¹⁸ Hospital costs associated with defense of lawsuits from infusion-related complications can be significant, including increases in insurance premiums, time of risk management and clinical staff for data collection, depositions, and trial appearances. Loss of reputation and subsequent loss of new patients can occur with a decrease in patient satisfaction or when complication rates are publicly reported. Rates for hospital-acquired conditions are available to the public through the Hospital Compare Web site.¹⁹

Higher rates of nursing turnover due to unacceptable stress levels on staff nurses should also be considered.²⁰⁻²² One report of nurse liability issues identified failure to properly monitor and maintain infusion sites in 13.2% of all closed claims from 2006 to 2010. The total amount paid for these claims was \$960 000.²³


Another aspect of cost is the difference between fixed and variable costs. Labor is generally a fixed cost, while costs of supplies are variable because they differ for each patient.¹² Salaries and benefits for the infusion team are fixed costs. Costs for CVAD insertion can be established by a standardized list for the procedure, although variations will occur if additional supplies and longer staff time are required to accomplish the procedure.

Prices for inpatient care are first established through the chargemaster system as described earlier. Unfortunately, patients without health insurance may be billed the actual charges established in the system. Rates are now negotiated by hospital administrators, especially since the inception of managed care for Medicare and Medicaid patients, along with private insurance payers expecting the most favorable rates. One traditional method of pricing is the ratio of cost to charges (RCC) method. For example, the total cost of operating a revenue-centered hospital department is \$2 million annually, and Medicare patients compose 60% of the patients served by this department, for a total of \$1.2 million coming to this revenue center from Medicare payments.¹²

The *relative value unit*²⁴ is another method of assigning costs to a unit of work. The necessary costs are determined for 1 basic procedure and assigned the value of 1. Costs for all other procedures are measured against the costs of the basic procedure and assigned a relative value unit (RVU). For a monthly assessment, the RVUs are totaled, and the operating costs are divided by the total RVUs performed to determine the cost per unit of work.¹² If the costs of inserting a short peripheral IV catheter using a standard set of supplies and nursing labor is established as \$50 with an RVU of 1, then a peripherally inserted central catheter (PICC)²⁵ insertion with a cost of \$400 would have a relative value of 8. If the monthly cost of operating the infusion team is \$7500 and the RVUs total 125, the cost per unit of work is \$60.

Activity-based costing (ABC)¹² has been applied in health care for only the past 15 to 20 years. As discussed, most other cost-accounting techniques are based on time (eg, minutes in the operating room) or patient volume (eg, patient-days). ABC identifies factors or drivers that generate the costs.¹² The intervention of inserting a PICC would include cost drivers listed in Table 1. A patient scheduled for PICC insertion without any unusual issues would have a lower cost than a patient with an urgent need for PICC insertion due to the failure to establish peripheral sites or to recognize the need for a PICC. This system would allow for easy identification of cost drivers such as urgent, unplanned insertion or factors contributing to insertion difficulty. One technological advancement of using ECG to determine tip location eliminates the need for chest radiograph on most patients. Eliminating the radiograph also eliminates the waiting time for radiograph results, the need to repeat the radiograph for aberrant tip locations, the concern over which licensed independent practitioner will “release” the PICC for use, and the issues associated with allowing nurse-inserters to assess the chest radiograph for tip location.

The primary emphasis for estimating costs and revenues is to be totally accurate, methodical, and comprehensive. Omitting or underestimating costs will not be

 TABLE 1 Activity-Based Cost Factors for PICC	
•	Failure to obtain and maintain peripheral IV sites
•	Urgent need for a PICC to establish vascular access
•	Scheduling of the nurse-inserters time
•	Patient assessment for most appropriate vascular access device
•	Communicating with the LIP for any concerns or questions
•	Collecting and transporting the needed equipment and supplies to the bedside or transporting patient to a treatment room
•	Insertion site selection
•	Establishing the sterile fields on the patient and the work table
•	Performing the insertion using ultrasound and ECG-based tip location technology
•	Difficulty with wire and/or catheter advancement
•	Obtaining a chest radiograph
•	Assessing tip location on chest radiograph or waiting for the radiology report
•	Management of any untoward reactions during the procedure
•	Cleaning up after the procedure
•	Documenting the procedure
<i>Abbreviations: PICC, peripherally inserted central catheter; LIP, licensed independent practitioner; ECG, electrocardiography.</i>	

helpful for the business case. The same is true for overestimating revenue. Audits will eventually discover the problems and destroy the trust established with the administrative decision makers.⁶

PROCESS FOR DEVELOPING THE BUSINESS CASE

The group of individuals involved in creating the business case proposal for an infusion team varies among hospitals. This group should include those with the knowledge and skills necessary to make the appropriate financial analysis.

The process is divided into different sections or phases (Table 2). The first task is to identify the issue(s) to be addressed. Department heads (eg, critical care, emergency department, outpatient services), thought-leaders, and stakeholders who are affected by these issues should also be contacted for input. Potential solutions should be developed through these discussions. Leading with the problem, rather than the desired solution, allows for an open-minded, analytical approach. Key administrative leaders in the hospital should be approached to ascertain if these issues are an organizational concern. Support from these administrative

TABLE 2

The Stages of Business Case Development

Phases	Objectives	Key Questions
Phase 1 - Strategic context or design phase	<p>Identify the hospital's needs, issues, and desired outcomes.</p> <p>Solicit administrative support for the project.</p> <p>Identify the objective for the project to be planned.</p> <p>Plan and collect data as needed to answer key questions.</p>	<p>What are the most frequent infusion-related challenges in your hospital?</p> <ul style="list-style-type: none"> Excessive number of patients requiring more than 2 attempts to establish an SPC insertion Complication rates associated with peripheral catheters Complication rates associated with central venous catheters Frequency of occurrence for hospital-acquired conditions on the CMS list Others <p>What are the desired rates for these challenges?</p> <p>Is there a business need for change as determined by the costs of these current challenges?</p> <p>What is driving the need for changing these outcomes?</p> <p>Are there risks associated with the current outcomes?</p> <p>Are there risks associated with changing the current outcomes?</p> <p>What are the desired achievements?</p> <p>Does the proposed change fit into the strategic plan of the hospital?</p> <p>What are the methods or software systems available for cost analysis in the hospital?</p>
Phase 2 - Analysis, recommendation, and creation	<p>Perform an analysis of the options or alternatives.</p> <p>Identify the viable options.</p> <p>Develop the justification based on financial analysis.</p>	<p>What are the possible options to achieve the goal(s) identified?</p> <ul style="list-style-type: none"> Start a new infusion team Expand an existing team Continued justification for an existing infusion team A decentralized approach by identifying proficient staff on each nursing unit Unit-by-unit introduction of the infusion team Staff development program for all nurses in all patient care areas Maintain the status quo <p>Which option(s) are the most clinically sound and financially viable?</p> <p>What is the best option?</p> <p>What is the rationale to support the best option?</p> <p>What are the annual costs for the proposed option?</p> <ul style="list-style-type: none"> Direct, indirect costs Opportunity costs <p>What cost savings can be attributed to the proposed option?</p> <p>What types of cost avoidance can be attributed to the proposed option?</p> <p>What revenue will be generated by the proposed option?</p> <p>What is the calculated financial outcome?</p> <ul style="list-style-type: none"> Estimated cost savings + additional revenue minus the initial start-up costs and ongoing operational costs <p>What is the plan for implementation?</p> <p>Are there infusion nurse specialists already employed at the hospital? What new positions must be filled?</p> <p>What new capital equipment must be purchased to implement the plan?</p> <p>What is the timeline for implementing the chosen option?</p>
Phase 3 - Presentation	<p>Perform an analysis of the options or strategically plan the presentation of the proposal.</p> <p>Present the recommendation(s).</p>	<p>Meet with key department managers and other stakeholders to discuss findings.</p> <p>Meet individually with chief officers to enhance their understanding of the proposal and obtain their support.</p> <p>Build consensus for support among other key individuals (eg, physicians, nurse practitioners, ancillary departments).</p> <p>Schedule a presentation at executive-level committee meetings.</p> <p>How will the proposal be presented?</p> <ul style="list-style-type: none"> In a written document, an oral presentation, or both? What group will be receiving the proposal? When should the decision be known? <p>Make the presentation more interesting by humanizing the data with stories.</p> <p>Use interesting graphs and charts to display data.</p>
Phase 4 - Implementation and management	<p>Initiate the plan.</p> <p>Manage the investment.</p>	<p>Begin the plan for implementation of the project.</p> <p>What changes will occur for nursing staff and the staff of other affected departments?</p> <p>What staff training is required to introduce the chosen option, its role, and scope of service?</p> <p>How will the chosen option be monitored?</p> <p>What data will be collected to show clinical improvement and financial outcomes?</p> <p>How frequently will these data be collected and analyzed?</p> <p>Who will do the collection and analysis?</p> <p>Who should receive the reports of this analysis?</p>

Abbreviations: CMS, Centers for Medicare & Medicaid Services; SPC, short peripheral catheter.

people will be a tremendous help with cost information and analytical techniques and processes currently being used in the facility.

Situational analysis can offer additional insights into the current problems and possible solutions. Strengths, weaknesses, opportunities, and threats (SWOT) for the proposed intervention are analyzed. Another acronym for a similar analysis is PEST: politico-legal, economic, social, and technical factors.²⁶

A standard template, if currently used at the hospital, should guide the contents of the written business case. If one is not available, suggested templates for initiating an infusion team and for expanding an existing team are included in appendices.

CONCLUSION

In our current situation of health care consumerism, patients are responsible for more out-of-pocket health care expenses; therefore, they are demanding quality along with increased services. As health care consumers become more knowledgeable, their expectation for patient-centered, high-quality care increases. Lower costs can come from care that is better coordinated, safer, and delivered in a more efficient manner. Infusion teams can be the source of lower costs.

Developing a business case will require a significant investment of time and skills; however, this is required to gain administrative support. Infusion nurses are highly skilled and knowledgeable members of the clinical team. Infusion nurse leaders see the benefits of infusion nursing services; however, we must be able to thoroughly document and communicate these advantages to the financial decision makers in the organization. This requires expanding our knowledge and skills into the business aspects of health care.

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APPENDIX 1 [Project Name] Infusion Team Development [Facility Name] XYZ Health Care System [Date]

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1. Executive Summary

This section provides an overview of the initiative to implement an infusion team. Typically, this section is developed after the other sections are completed, as it constitutes a summary of the details provided.

1.1. Issue

This section should concisely and accurately describe the problems to be addressed by an infusion team. Use business and financial terms to highlight the issues associated with providing cost-effective, quality infusion nursing care using a dedicated team of qualified, skilled, knowledgeable, and competent infusion nurses.

1.2. Anticipated Outcomes

This section should identify the primary outcome of the project, specifically a dedicated team of infusion nurses intended to enhance patient safety and satisfaction while reducing labor costs, inventory of infusion supplies, and other related costs.

1.3. Recommendation

This section briefly describes how the project will address the business problem and how results will be achieved. State the specific recommendation for an infusion team with a description of the nursing units to be serviced and the number of hours per day and days per week for operation of this team. The project to develop an infusion team will be led by key stakeholders of the organization and will include the collection and analysis of baseline or pre-implementation data, ongoing collection and analysis of data related to key performance indicators during implementation, and comparison at full implementation to baseline for measures of success. It is anticipated that the implementation of an infusion team will allow more efficient use of nursing labor, reduce costs of infusion supplies and inventory, reduce infection rates, significantly improve aspects of patient care and safety, and enhance patient satisfaction.

1.4. Justification

This section provides reasons for implementing the infusion team and why this approach was selected. Published literature should be consulted to identify the benefits of an infusion team. Consultation with other organizations that have implemented an infusion team could reveal cost savings, reduction of infections related to infusion devices, reduction of infusion-related complications, decreased wait time for device insertion, fewer insertion attempts, and changes in patient satisfaction metrics.

2. Business Case Team

This section describes the roles of the team members who will develop the business case for an infusion team. A single individual should coordinate creation of the business case. This person is often seen as the “project champion” who can prepare locally based analysis of what needs to be done and how this may be achieved.¹ List all members of the team and their current roles within the organization.

The following table suggests the team of health care professionals responsible for creating and presenting this pro-posal to the final decision makers. They will be responsible for the collection and analysis of information used in the creation of this business case.

Role	Description	Name/Title
Executive sponsor	Provides executive support	Director of nursing, chief nursing officer, vice president for nursing, or another director designated by nursing leadership
Project champion	Primary author of the proposal	Infusion nurse specialist
Managers from affected departments interested in the project Interested staff nurses	Provide feedback on current clinical problems, issues, and costs Leadership/management of the infusion team may come from this group	
Technical support	Provides support for retrieval of data for outcome and cost analysis	

3. Problem Definition

3.1. Problem Statement

This section describes the business problem(s) addressed by the proposed infusion team. The problem(s) may involve the process of providing infusion therapy, infusion-related technology, or a combination of many factors. This section should not include any discussion related to the solution.

Retrospective data collection and analysis of outcomes over the last year could demonstrate an increase in costs associated with the infusion therapy process. Supply costs and waste, complication rates, incident or unusual occurrence reports, sentinel events and serious safety events are valuable data to assess. Changes in patient satisfaction scores related to IV skills among nursing staff may have changed over time. If possible, compare these scores over a specific period.^{1,2}

3.2. Organizational Impact

This section describes how the proposed infusion team will modify or affect the organization. It should also explain any newly created roles and how existing roles may change as a result of this new infusion team.

The role of the infusion team manager and staff must be decided along with a thorough discussion of how the new infusion team will interact with other facility operations (eg, radiology, outpatient services, emergency department). There should be clear statements about the scope of infusion therapy services assigned to the infusion team versus those activities that will be the responsibility of the staff nurse.

Many aspects of organizational change could occur from the development of an infusion team. The need for staff development and mentoring of all patient care staff may be required to improve those aspects of infusion care assigned to the nursing staff. Expert infusion nurses may be expected to manage product evaluation and quality improvement projects, identify other risk management strategies, and serve on related organizational committees. The section provides a high-level explanation of how the organization will be affected as a result of the infusion team.

The infusion team members could augment infusion practice within the organization by serving as consultants, educators, and advisors to the primary care team. Infusion team members could lead process changes focusing on reduction of operational losses and improved patient outcomes. The financial impact of these activities on the organization must be calculated and analyzed.

4. Proposal Overview

This section describes high-level information about the proposed infusion team including a description, goals and objectives, performance criteria, assumptions, constraints, and milestones. Consolidate all specific information into this section to provide an easy understanding of the baseline business problem, impacts, and recommendations.

4.1. Proposal Description

This section describes the purpose of the proposed infusion team, the goals and objectives, performance criteria, assumptions, constraints, and milestones associated with the infusion team implementation.

Improved patient outcomes and a positive impact on financial performance will always be the desired goal of the infusion team. Infusion therapy includes numerous frequent nursing interventions and is one of the most invasive procedures performed in virtually all hospital departments and clinical service areas. Currently, infusion therapy practice is a shared responsibility among numerous disciplines in the facility. Nursing, radiology, emergency services, and critical care all provide a wide variety of infusion therapy. This includes all types of vascular access device (VAD) insertion; routine maintenance of the VAD; complication identification and treatment; configuring, programming, and monitoring complicated systems for infusion of complex fluid and medication combinations; monitoring parenteral nutrition solutions; and managing transfusion of numerous blood components. Professionals with different training and competence levels perform the procedures, which may generate variability in performance and outcomes. Costs of care and complications rates for each discipline or specialty area may be necessary.

The proposed infusion team would address this variability in practice by establishing a more consistent standardized approach to infusion practice. Practice standardization allows for accurate measurement of those interventions producing positive outcomes, both clinically and financially.

The description of this team would include a designated number of full-time equivalent (FTE) members serving as a resource for all infusion-related issues. This section should highlight the services provided by

the infusion team such as education and skill development for staff nurses for those infusion-related interventions assigned to their scope of practice; serve as a skilled resource when staff nurses encounter difficulty (eg, venipuncture on patients with difficult veins); provide ongoing educational services about new procedures, products, and policies related to infusion therapy; act as the skilled resource for selection, insertion, and management of other VADs (eg, midline, central venous catheters, hemodialysis catheters); provide quality improvement services to all nursing units; provide peripherally inserted central catheter (PICC)/central vascular access device (CVAD) insertions for in and outpatients; and provide skilled services to ancillary departments (eg, emergency, radiology, etc); serve as a primary component of a blood transfusion program; and act as a resource for issues related to IV medication and parenteral nutrition.

4.2. Goals and Objectives

This section lists how the proposed infusion team will enhance the hospital's ability to meet established goals and objectives. The table below highlights several possible goals and how the investment in an infusion team would support them.

Business Goal/Objective	Description
Patient-centered care	Encouraging patients and family members to be involved with choosing the VAD best suited for them to manage long-term infusion therapy in the home
Creation of a fair and just culture in the organization	Encouraging all staff to speak out about problems (eg, excessive venipunctures for peripheral catheter insertion) and errors (eg, IV medication errors) with honesty and respect for all involved
Reduce overall supply costs	Reduction of supply costs associated with infusion therapy procedures through improving venipuncture proficiency rates and appropriate use of administration sets and other add-on devices due to standardization and staff development
Improve patient outcomes	Reduction of infusion-related complications through use of infusion nurse specialists and staff development regarding infusion therapy practices

Abbreviations: IV, intravenous; VAD, vascular access device.

4.3. Performance

The following table lists the key resources and services and their anticipated outcomes, which can be used to measure the effectiveness of an infusion team.

Key Resource/Process/Service	Performance Measure
SPC insertions by infusion team member	Catheter use will decrease by a predetermined percentage because of improved first venipuncture attempt success. Rates of unplanned catheter removal due to infiltration, occlusion, phlebitis will be reduced.
CVAD dressing changes by infusion team member	CLABSI rates will decrease by a predetermined percentage annually. CVAD dislodgment and resulting malposition will decrease by a predetermined percentage.
Unit and/or patient rounds by infusion team member	Compliance with standards and guidelines for VAD removal as soon as it is no longer medically necessary
Improve success rate of SPC insertions when this is assigned to staff nurses	Success rate of insertion on first attempt exceeds the established threshold ³⁻⁵
Decreased incidence of phlebitis	Using standard criteria for identifying and staging phlebitis, the incidence of infusion phlebitis is below the established threshold. ⁴⁻⁶
Decreased incidence of infiltration and extravasation	Using standard criteria for identifying and staging infiltration, the incidence of infiltration and extravasation is below the established threshold. ^{5,6}
Patient satisfaction with SPC insertion	The patient satisfaction score related to SPC insertion exceeds the established threshold. ⁷
Occlusion of CVADs	The incidence of occlusion of CVADs is below the established threshold. ^{5,6}
CLABSI	The incidence of CLABSI is at or near zero. ^{8,9}
Timely insertion of SPC	The wait-time for SPC insertions is below established threshold. ^{3,5,10}
Dislodgment of VADs	The incidence of VAD dislodgment is below established threshold due to adequate use of stabilization devices. ^{11,12}
Standardization of supplies	Reduction in IV supply budget through standardization across all departments including <ul style="list-style-type: none"> • SPCs • SPC insertion kits • Dressings for each type of VAD • Stabilization devices for all VADs • Needleless connectors • IV administration sets

Abbreviations: CLABSI, central line-associated bloodstream infection; CVAD, central vascular access device; IV, intravenous; SPC, short peripheral catheter; VAD, vascular access device.

4.4. Assumptions

This section provides an initial list of assumptions that underlie the project. Assumptions are statements about something that is taken for granted or a belief without proof. There should be adequate knowledge about each statement before it is included as an assumption. While there could be a risk of rejection by highlighting negative assumptions, it is necessary to address these issues since avoiding them could mean immediate rejection of the proposal. Additional assumptions can be added as the project moves forward.

Assumptions could include the details of patient care that will remain the same. Purchasing prices for applicable devices may change with contract negotiations; however, the prices used for all calculations should be transparent. Other assumptions could include the mix of payers (eg, Medicare, Medicaid, private insurers) and the percentage of each in the facility.

The following assumptions may apply to the implementation of an infusion team:

- The organization's budget is sufficient to support an infusion team.
- There is sufficient nursing expertise in infusion therapy to staff the infusion team.
- There is support from nursing staff and administration for the establishment of an infusion team.
- Baseline data for evaluation of an infusion team are available or there is a means to obtain such data.

4.5. Constraints

This section provides an initial list of constraints, restrictions, or limitations that underlie the project. Additional constraints may be added as the project moves forward. While this section highlights negative aspects of the proposed infusion team, it is mandatory that these be included.

The major constraints that always seem apparent are the limitations of organizational budgets; however, other constraints could occur, such as the acquisition and merger of multiple facilities into one organization.

The following constraints may or may not be present in the organization:

- Limited funds to support the infusion team (salaries, benefits, supplies, overhead)
- Lack of nursing expertise necessary for an infusion team (documented expertise in infusion therapy, such as national certification)
- Insufficient baseline data of key performance indicators, which would serve as the basis for the effect of the infusion team
- Resistance from nursing/medical staff to the concept of an infusion team

4.6. Proposed Milestones

This section lists the milestones that mark progression of the infusion team implementation and the targeted completion dates. Progress toward the goals can easily be measured by this plan. For instance, retrospective data collection and analysis would require a set number of weeks or months, followed by the need to collect and analyze outcome data in a prospective manner.

Milestones/Deliverables	Target Date
Forming the task force to create the business case	
Collection or review of baseline data of interest to the business care team (see key performance measures)	
Finalizing the written report of the infusion team business case	
Presenting the business case to the executive group of decision makers	
Establishment of a working group (interdisciplinary committee/task force, stakeholders) charged with the development of the infusion team	
Establishment of a timeline for development of the infusion team	
Definition of roles and responsibilities of the infusion team	
Development of measures to evaluate the effect of the infusion team and its activities (see key performance measures)	
Development of a budget to support the infusion team and its activities	
Education/training of nursing staff and team members as needed	
Implementation of the infusion team	
Ongoing monitoring and measurement of key performance measures	
Reporting to key stakeholders	

5. Alignment with Strategic Goals

The infusion team business case should show congruence with the organization's mission, goals, and strategic plan. Those who are involved in preparing the business case should obtain a copy of these, commonly available in policies and procedures, marketing materials, and Web sites. Generally, these statements are global; however, more emphasis is now placed on adherence to:

- National Patient Safety Goals from the Joint Commission, especially those related to infection prevention, medication administration, and equipment alarms (http://www.jointcommission.org/standards_information/npsgs.aspx)
- Hospital Care Quality Information from the Consumer Perspective (HCAHPS) (<http://www.hcahpsonline.org/home.aspx>)
- Patient satisfaction measures
- Organizational data, if available, for baseline CLABSI infection rates, peripheral venipuncture attempts, infiltration/extravasation rates, IV supply inventory and monthly costs, and IV-related incidents, sentinel and/or serious safety events

Plan	Goals/Objectives	Relationship to Project
Mission for the organization	Provide the highest quality of health care services to the community.	This project will provide quality care in reference to NPSG to reduce the incidence of CLABSI, increase consumer satisfaction by decreasing IV start attempts, and reduce the incidence of infiltration/extravasation.
Annual goals for the organization	Provide cost-effective care.	This project will reduce labor costs by more efficient use of staff and reduce IV supply costs by reducing inventory or streamlining inventory management.
Annual strategic plan for the organization	Enhance stature within the community.	This project will provide data that can be shared through publication about the high quality of care provided relative to infusion procedures.

Abbreviations: CLABSI, central line-associated bloodstream infection; IV, intravenous; NPSG, National Patient Safety Goals.

6. Cost-Benefit Analysis

Many consider this one of the most important parts of a business case, as it is often the costs or savings projection that affects the final approval to move forward. It is important to quantify the financial benefits of the development of an infusion team as much as possible in the business case. This is usually done in the form of a cost-benefit analysis. The purpose of this is to illustrate the costs associated with the proposed change and compare them with the benefits and savings to demonstrate the value to the organization.

This section should include the salary, benefits, and payroll expenses for infusion team members. It is preferable to use organization-specific data; however, data from published literature could be used. Infusion nurse experts drive anticipated savings from more efficient time management, reduction in wait time (thus improving patient throughput), and reduction in time to perform a variety of procedures. Catheter use can also demonstrate a reduction in costs as a result of increased competency.⁴ A review of your current supply costs associated with an IV start can be used as a baseline. Two examples of estimating costs can be found in a 2010 article in the *Journal of Infusion Nursing*.¹³

Costs of infusion-related complications can be high, especially when those costs are not reimbursed due to rules for hospital-acquired conditions. One study analyzed the treatment costs for catheter-related bloodstream infection (CR-BSI) and compared those costs to the amount of revenue generated by these patients. In 54 patients with CR-BSI, the study documented a loss of \$1.44 million.¹⁴

Reduction in these complications and their associated costs can be used to offset the costs of the infusion team staff due to their higher level of knowledge and skill.

The following table captures the cost and savings with the development of the infusion team. This cost/benefit table provides a picture of the annual impact.

Action	Action Type	Description	Annual Cost/Savings (Costs)
Develop team	Cost	Addition of FTEs; annual salary and benefit for FTEs = \$xx	(\$\$)
Reduce supply costs by 20%	Savings	Reduction of catheter insertion supplies by 20% by increasing venipuncture proficiency on first attempt and reducing unscheduled restarts. Example: Current supply cost estimated at \$xx.	\$\$
Reduce labor costs associated with SPC requiring unplanned removal and reinsertion (salary + benefits + payroll costs)	Savings	Calculate the time required for reinsertion of SPC; multiply by the number of unplanned SPC reinsertions and calculate savings.	\$\$
Reduction in infusion related complications	Savings	Calculate treatment costs associated with infections, phlebitis, thrombosis, infiltrations, extravasations. Estimate reduction in rates.	\$\$
Annual Impact			

Abbreviations: FTE, full-time equivalent; SPC, short peripheral catheter.

7. Alternative Analysis

As with most business issues, there could be multiple ways to address the problem. The analysis in this business case supports the option of an infusion team as the most appropriate method for solving the business problems; however, a brief discussion of alternative approaches is necessary. This discussion should include an explanation of the reason(s) for not choosing these alternatives.

Alternatives	Reasons for Not Selecting
Maintain the status quo with all members of the health care team inserting all VADs and performing all infusion therapy.	Analysis of the current costs of labor and inventory indicates this is the highest cost option. Current methods are associated with the clinical outcomes now seen (unacceptably high rates of CLABSI, iatrogenic pneumothorax during CVAD insertion, thrombophlebitis, IV medication errors, etc). The current rates of complications and errors have not improved regardless of the other strategies employed. Absence of reimbursement for treating hospital-acquired conditions means that hospital costs will continue to increase.
CVAD insertion by all physicians; SPC insertion by all nursing staff; all nursing staff responsible for infusion therapy practices	Intensive education and training for all nursing staff about infusion therapy would be time- and labor-intensive and cost-prohibitive.
CVAD insertion by a designated small group of nurses and radiology technologists; all nursing staff responsible for infusion therapy practices	CVAD inserters would not have time to provide support for nursing staff with infusion-related issues and challenges. Limited hours of operation for CVAD insertion would not provide the same standard of care for all hours of the day and all days of the week. Cost savings would not be realized for SPC insertion or other infusion-related products. Complication rates would not be altered because of the lack of expert support services from infusion nurses.

Abbreviations: CVAD, central vascular access device; SPC, short peripheral catheter; VAD, vascular access device.

8. Approvals

This document would require administrative signatures confirming their approval of this project.

The signatures of the people below indicate an understanding of the purpose and content of this document. These signatures indicate approval of the proposed project and that the next steps for development of an infusion team may be taken.

Approver Name	Title	Signature	Date

REFERENCES

1. Bolton D. Writing a business case for the expansion of service: expanding the IV therapy team, from start to finish. *J Infect Prev.* 2009;10(suppl 1):S27-32.
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NOTES

APPENDIX 2 [Project Name] Infusion Team Expansion [Facility Name] XYZ Health Care System [Date]

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1. Executive Summary

This section provides an overview of the initiative to expand an infusion team. Typically, this section is developed after the other sections are completed as it constitutes a summary of the detail provided.

1.1. Issue

This section should concisely and accurately describe the problem(s) to be addressed by expansion of the present infusion team. This may involve the current staffing levels for the infusion team, increasing demands for services provided by the infusion team, and unmet patient needs.

1.2. Anticipated Outcomes

This section should identify the primary outcome of expansion of the infusion team, including improving patient throughput in the health care system by adequate staffing or expansion of service hours for the infusion team. Improvement in all aspects of patient safety and cost reduction or cost containment should be emphasized.

1.3. Recommendation

This section briefly describes how the project will address the business problem and how results will be achieved. State the specific recommendation for expansion of the current infusion team.

Expansion of an infusion team will be led by key stakeholders of the organization. The collection and analysis of baseline data include current productivity data (eg, types and number of procedures performed) and incidence or prevalence data of complications and errors. Ongoing collection and analysis of data should be related to key performance indicators during implementation and compared at full implementation to baseline for measures of success. It is anticipated that the expansion of an infusion team will reduce costs of infusion supplies and inventory, along with more appropriate throughput of patients in the health care system producing more appropriate transfer to other service providers (eg, home, long-term, or ambulatory care). Further reduction in all complication rates (eg, central line-associated bloodstream infection [CLABSI], iatrogenic pneumothorax during insertion of a central vascular access device [CVAD], intravenous [IV] medication errors) is likely. These improvements will significantly improve aspects of patient care and safety and enhance patient satisfaction.

1.4. Justification

This section provides reasons for implementing the project and why this approach was selected. The primary purpose for expansion of an existing infusion team is to meet patient needs. This could be related to changes in patient acuity, increasing numbers of patients in need of infusion services, and/or expansion of services to other departments not previously covered by the infusion team.

2. Business Case Team

This section describes the roles of the team members who will be involved in the development of the business case. The business case should be coordinated by a single individual. This person is often seen as the “project champion” who can prepare a locally based analysis of what needs to be done and how this can be achieved.¹ List all members of the team and their current roles within the organization.

The following table suggests the team of health care professionals presenting this proposal. They will be responsible for the collection and analysis of information used in the creation of the business case for the expansion of an infusion team.

Role	Description	Name/Title
Executive sponsor	Provides executive support	Director of nursing, chief nursing officer, vice president for nursing, or other director designated by nursing leadership
Project champion, infusion team manager, or director	Primary author of the proposal, provides leadership/management of the infusion team	
Managers from affected departments	Provide the data from the departments in need of infusion services (eg, critical care, radiology, etc)	
Technical support	Provides support for retrieval of data to support proposal and cost analysis	

3. Problem Definition

3.1. Problem Statement

This section describes the business problem that your proposal addresses. The problem may be process, technology, or product/service oriented. This section should not include any discussion related to the solution.

Describe the original services of the current team (eg, insertion of peripherally inserted central catheters [PICCs]) when it was initiated, the current number of team members, and under whose direction they function (eg, interventional radiology). Explain the challenges and limitations of this plan. Staff nurses performing the insertion of short peripheral catheters (SPCs) could result in many failed attempts and vein wasting. This could result in unnecessary insertion of CVADs when the infusion therapy characteristics (eg, pH, osmolarity, etc) did not require a CVAD.

Examine the growth of the PICC insertion procedures since the service began and compare this to the current number of procedures. Has the number of team members remained the same or changed in any way? What other supportive services were the team able to provide at the beginning (eg, difficult SPC insertion), but the growth of PICC insertion now decreases availability of the team members to provide the same level of support to the nursing staff? Compare the changes in annual SPC purchases over this same period of time.

Through data collection and analysis of outcomes over the last year, demonstrate how these changes are associated with an increase in costs. Include purchase costs for all catheters and supplies, along with the costs of labor and overhead. In addition, include data on increases in complication rates, such as phlebitis and infiltration, along with changes in patient satisfaction scores related to infusion therapy services.^{1,2}

3.2. Organizational Impact

This section describes how the proposed change will modify or affect the organization. It should also explain any new roles that would be created or how existing roles may change as a result of the infusion team expansion.

Adding more full-time equivalent (FTE) members and transitioning the team from an “insertion team” to an “infusion team” will relieve the burden on staff nurses while enhancing patient outcomes and satisfaction. This transition to an infusion team will allow more time for training and mentoring of the nursing staff in best practices for infusion therapy that remains within their scope of responsibility (eg, infusion pump management, administration of IV medications and blood transfusion).³

The expansion of the infusion team will allow for the team members to be involved with product evaluation, greater standardization of infusion practices throughout the organization, more effective measurement of clinical outcomes, and enhancement of staff development and risk management. The team members will lead process changes that can help reduce operational losses and result in improved patient outcomes and revenue savings.

The existing reporting structure would not change. The current PICC team manager would assume responsibility for the additional team members.

4. Proposal Overview

This section describes high-level information about the proposal to include a description, goals and objectives, performance criteria, assumptions, constraints, and milestones. Consolidate all specific information into this section to provide an easy understanding of the baseline business problem, impacts, and recommendations.

4.1. Proposal Description

This section describes the purpose of the expansion of the infusion team, the elements of the project, and a general description of how it will be executed.

Improved patient outcomes and a positive impact on financial performance will always be the desired goal of the infusion team.

Infusion therapy includes frequent nursing interventions and is one of the most invasive procedures performed in virtually all hospital departments and clinical service areas. Currently, infusion therapy practice is a shared responsibility among numerous disciplines in the facility. Nursing, radiology, emergency services, and critical care all provide a wide variety of infusion therapy. This includes all types of vascular access device (VAD) insertion; routine maintenance of the VAD; complication identification and treatment; configuring, programming, and monitoring complicated systems for infusion of complex fluid and medication combinations; monitoring parenteral nutrition solutions; and managing transfusion of numerous

blood components. Professionals with different training and competence levels perform the procedures, which may generate variability in performance and outcomes. Costs of care and complications rates for each discipline or specialty area may be necessary.

The proposed expansion of the infusion team aims to address this variability in practice by establishing a more consistent approach to infusion practice. Expansion of the current infusion team will enhance patient throughput, reduce delays of infusion services, and improve patient outcomes by reducing complications. As a result of these changes, the likelihood of reducing costs and increasing revenues is increased.

Expansion of the infusion team will mean that services can be expanded to outpatients where the billable procedures are different. For inpatients, infusion therapy procedures such as PICC/CVAD insertion are included in the capitated fees (eg, diagnosis-related group [DRG] for Medicare, yearly contracted amounts for health maintenance organizations [HMOs]). PICC insertions for outpatients are billed by the procedure, thus enhancing revenue for the organization.

Readmission of patients is now being discouraged and may result in loss of revenue. Providing consultation services to long-term, ambulatory, or home care companies may lead to a reduction in readmissions from unrecognized complications such as infection or thrombosis.

Providing appropriate VAD insertion more rapidly due to expanded staff numbers and/or hours of service could result in more rapid treatment of disease processes, resulting in faster discharge and filling that same inpatient bed with another patient.

4.2. Goals and Objectives

This section lists how the expansion of the infusion team will meet the goals and objectives of the organization.

The table below highlights the corporate goals and how the investment in an infusion therapy team would support them.

Business Goal/Objective	Description
Patient-centered care	Encouraging patients and family members to be involved with choosing the VAD best suited for them to manage long-term infusion therapy in the home
Creation of a fair and just culture in the organization	Encouraging all staff to speak out about problems (eg, excessive venipuncture for peripheral catheter insertion) and errors (eg, IV medication errors) with honesty and respect for all involved
Reduce overall supply costs	Reduction of supply costs associated with infusion therapy procedures through improving venipuncture proficiency rates and appropriate use of administration sets and other add-on devices due to standardization and staff development
Improve patient outcomes	Reduction of infusion-related complications through use of infusion nurse specialists and staff development regarding infusion therapy practices

4.3. Performance

The following table lists the key resources and services and their anticipated outcomes, which can be used to measure the effectiveness of the expansion of an infusion team:

Key Resource/Process/Service	Performance Measure
Insertion of SPC by infusion team member	Catheter use will decrease by a predetermined percentage because of improved first venipuncture attempt success. Reduced rates of unplanned catheter removal due to infiltration, occlusion, phlebitis
CVAD dressing changes by dedicated infusion team member	CLABSI rates will decrease by a predetermined percentage annually.
Unit rounds by infusion team member	Compliance with standards and guidelines for VAD removal as soon as it is no longer medically necessary
Improve success rate of SPC insertions	Success rate of insertion on first attempt exceeds threshold. ⁴⁻⁶
Decreased incidence of phlebitis	Using standard criteria for identifying and staging phlebitis, the incidence of infusion phlebitis is below threshold. ⁵⁻⁷
Decreased incidence of infiltration	Using standard criteria for identifying and staging infiltration, the incidence of infiltration is below threshold. ^{6,7}
Patient satisfaction with SPC insertion	The patient satisfaction score related to SPC insertion exceeds threshold. ⁸
Occlusion of CVADs	The incidence of occlusion of CVADs is below threshold. ^{6,7}
CLABSI	The incidence of CLABSI is below threshold. ^{9,10}
Timely SPC insertions	The wait-time for SPC insertions is below threshold. ^{4,6,11}
Dislodgment of VADs	The incidence of SPC/PICC dislodgment is below threshold.
Standardization of supplies	Reduction in IV supply budget through standardization across all departments including: <ul style="list-style-type: none"> • SPC • SPC insertion kits • Dressings for each type of VAD • Stabilization devices for all VADs • Needleless connectors • IV administration sets

Abbreviations: CLABSI, central line-associated bloodstream infection; CVAD, central vascular access device; PICC, peripherally inserted central catheter; SPC, short peripheral catheter; VAD, vascular access device.

4.4. Assumptions

This section provides an initial list of assumptions that underlie the expansion of the infusion team. Assumptions are statements about something that is taken for granted or a belief without proof. There should be adequate knowledge about each statement before it is included as an assumption. While there could be a risk of rejection by highlighting negative assumptions, it is necessary to address these issues since avoiding them could mean immediate rejection of the proposal. Additional assumptions can be added as the project moves forward.

Assumptions could include the details of patient care that will remain the same. Purchasing prices for applicable devices may change with contract negotiations; however, the prices used for all calculations should be transparent. Other assumptions could include the mix of payers (eg, Medicare, Medicaid, private insurers) and the percentage of each in the facility.

The following assumptions may apply to the expansion of an infusion team:

- The organization's budget is sufficient to support the expansion of an infusion team.
- There is sufficient nursing expertise in infusion therapy to staff the expanded infusion team.
- There is support from nursing staff and administration for the expansion of an infusion team.
- Baseline data from which the effect of the expanded infusion team can be evaluated are available or there is a means to obtain such data.

4.5. Constraints

This section provides an initial list of constraints that underlie the project. Additional constraints may be added as the project moves forward. While this section highlights negative aspects of the proposed expanded infusion team, it is mandatory that these be included.

The following constraints may or may not be present in the organization:

- Limited funds to support an expansion of the infusion team (salaries, benefits, supplies, overhead) on either a part-time or full-time basis
- Lack of experienced staff necessary for the infusion team expansion and the subsequent need for recruiting qualified staff

4.6. Proposed Milestones

This section lists the milestones that mark progression of the expansion of the infusion team and the targeted completion dates. Progress toward the goals can easily be measured by this plan. Productivity data (eg, procedures performed) should already be available; however, the full complement of outcome data may need to be collected and analyzed.

Milestones/Deliverables	Target Date
Forming the task force to create the business case	
Analysis of productivity and outcome data	
Collection of additional outcome data as needed	
Finalizing the written report of the infusion team expansion business case	
Presenting the business case to the executive group of decision makers	
Establishment of a working group (interdisciplinary committee/task force, stakeholders) charged with the expansion of the infusion team	
Establishment of a timeline for the implementation of the infusion team expansion	
Development or enhancement of measures to evaluate the effect of the expanded infusion team and its activities (see key performance measures)	
Development of a budget to support the expanded infusion team	
Education/training of staff in departments now receiving services from the expanded infusion team	
Recruitment and training of new team members	
Implementation for the expanded services	
Ongoing monitoring and measurement of key performance	
Reporting to key stakeholders	

5. Alignment with Strategic Goals

Expansion of the infusion team should show congruence with the organization's mission, goals, and strategic plan. Those who are involved in preparing the business case should obtain a copy of the organization's mission, goals, and strategic plan, which is commonly available in policies and procedures, marketing materials, and Web sites. Generally, these statements are global; however, more emphasis is now placed on adherence to:

- National Patient Safety Goals from the Joint Commission, especially those related to infection prevention, medication administration, and equipment alarms. http://www.jointcommission.org/standards_information/npsgs.aspx
- Hospital Care Quality Information from the Consumer Perspective (HCAHPS) <http://www.hcahpsonline.org/home.aspx>.
- Patient satisfaction measures.
- Organizational data, if available, for baseline CLABSI rates; peripheral venipuncture attempts; infiltration/extravasation rates; IV supply inventory and monthly costs; and IV-related incidents, sentinel events, and serious safety events.

Plan	Goals/Objectives	Relationship to Project
Mission for organization	Provide the highest quality of care to the community.	This project will provide quality care in reference to NPSG.07.04.01 to reduce the incidence of CLABSI, eliminate delays with VAD insertion, increase consumer satisfaction by decreasing attempts for SPC insertion, and reduce the incidence of infiltration/extravasation.
Annual goals for organization	Provide cost-effective care.	This project will reduce IV supply costs by reducing inventory and reducing monthly supply costs.
Annual strategic plan for the organization	Enhance stature within the community.	This project will provide data that can be shared through publication about the high quality of care provided relative to infusion procedures.

Abbreviations: CLABSI, central line-associated bloodstream infection; IV, intravenous; NPSG, National Patient Safety Goals; SPC, short peripheral catheter; VAD, vascular access device.

6. Cost-Benefit Analysis

Many consider this one of the most important parts of a business case, as it is often the costs or savings projection that affects the final approval to move forward. It is important to quantify the financial benefits of the expansion of an infusion team as much as possible in the business case. This is usually done in the form of a cost-benefit analysis. The purpose of this is to illustrate the costs associated with the proposed change and compare them with the benefits and savings to demonstrate the value to the organization.

This section should include the salary and benefits for additional team members. Determining the savings to offset the extra FTEs should be demonstrated based on data from your own institution, or from the literature.

Catheter use can also demonstrate a reduction in costs as a result of increased competency.⁴ A review of your current supply costs associated with SPC insertion can be used as a baseline. An example of estimating costs can be found in the Sept/Oct 2010 *Journal of Infusion Nursing*.¹² Costs of infusion-related complications can also be valuable in demonstrating the impact of increasing staff who possess a higher level of competence.

The following table captures the cost and savings with the expansion of the infusion team. This cost-benefit table provides a picture of the annual impact:

Action	Action Type	Description	Annual Cost/ Savings (Costs)
Expanded infusion team	Cost	Additional FTEs; annual salary and benefit for 1 FTE = \$xx	(\$\$)
Reduce supply costs by 20%	Savings	Reduction of catheter insertion supplies by 20% by increasing first-venipuncture proficiency and reducing unscheduled restarts. Example: Current supply cost estimated at \$xx	\$\$
Reduce labor costs associated with removal and reinsertion of SPC	Savings	Calculate the time required for reinsertion of SPC; multiply by the number of unplanned SPC reinsertions and calculate savings.	\$\$
Reduction in infusion-related complications	Savings	Calculate treatment costs associated with SPC infections, infiltrations, extravasations. Estimate reduction in rates.	\$\$
Reduction in delays for appropriate CVAD insertion	Savings	Calculate the cost of delays in starting infusion therapy because the CVAD insertion cannot be scheduled due to lack of staff	\$\$
Reduction in the number of unnecessary CVADs	Savings	Calculate the cost of PICCs or other CVADs now being inserted because an SPC cannot be inserted due to staff skill level. Current CLABSI rates could also be applied as costs avoided.	\$\$
Annual Impact			

Abbreviations: CLABSI, central line-associated bloodstream infection; CVAD, central vascular access device; FTE, full-time equivalent; IV, intravenous; PICC, peripherally inserted central catheter; SPC, short peripheral catheter.

7. Alternative Analysis

As with most business issues, there could be multiple ways to address the problem. The analysis in this business case supports the expansion of the current infusion team as the most appropriate method of solving the business problems; however, a brief discussion of alternative approaches is necessary. This discussion should include an explanation of the reason(s) for not choosing these alternatives.

Alternatives	Reasons for Not Selecting
Maintain the status quo with the current infusion team staffing	Analysis of the current costs indicates that this is the highest cost option. Current staffing for the infusion team means a certain number of patients' needs will go unmet on a monthly basis.
Contracting with an outside service for CVAD insertion	Travel delays for the staff of the contracted service could mean that delays in CVAD insertion still exist. Additional services provided by the expanded infusion team would not be provided by this contract service. Charges for CVAD insertion could be more than the costs for expanding the infusion team.

Abbreviations: CVAD, central vascular access device.

8. Approvals

This document would require administrative signatures confirming their approval of this project.

The signatures of the people below indicate an understanding of the purpose and content of this document. These signatures indicate approval of the proposed project and that the next steps for development of an infusion team may be taken.

Approver Name	Title	Signature	Date

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