COMMUNICATING THE VALUE CONTRIBUTIONS OF PATHOLOGY

AND LABORATORY MEDICINE (PaLM) TO

HEALTHCARE ADMINISTRATORS,

EVIDENCE OF VALUE FROM A MULTIPLE CASES STUDY

by

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Abstract

Hospital administrators were interviewed to explore their perceptions of the strategic alignment of PaLM value-based activities (VBAs). Hospital based PaLM leaders were interviewed to explore their communication of the VBAs. This study identified a misalignment between the assessments utilized by healthcare administrators for PaLM services and the value contributions of laboratorians. PaLM leaders offered insight into the laboratory's value chain. Three themes emerged from the data: PaLM VBAs, PaLM communication efforts, and PaLM VBA strategic alignment. Together these findings suggest that hospital laboratorians offer untapped value in healthcare, and hospital administrators failing to recognize this value miss opportunities to improve value and capture cost savings. Suggestions to improve the communication of PaLM VBAs and the perceptions of hospital administrators are made.

Keywords: pathology, hospital laboratory, healthcare administrators, VBHC, value-based healthcare, value chain, laboratory science, laboratory medicine

Dedication

This work is dedicated a "Wonderfully Blessed*"* Proverbs woman,

my mom, Rosemary, and to her lifelong love,

my dad, Gary, a man after God's own heart.

Acknowledgments

My humble appreciation is bestowed upon Liberty University, my dissertation committee members, and my research chair for guiding me through the *hard work*. My heartfelt gratitude is given to my research participants, the healthcare leaders diligently performing the *valuable work*. Lastly, my admiration is offered to PaLM leaders around the world taking the time to publish the *good works* referenced in this study.

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Section 1: Foundation of the Study

According to the Centers for Medicare and Medicaid Services (CMS) (2019a), healthcare expenditures in the United States topped $3.6 trillion in 2018 with the costs of care reaching 17.7% of gross domestic product. CMS adds that expenditures under the existing healthcare law will nearly double to $6.0 trillion by 2027. This escalating cost of healthcare is unsustainable and inefficient according to the Institute of Medicine (2013). To curb healthcare's cost growth, government payers modified reimbursement structures from volume-based to value-based purchasing (VBP), offering financial incentives based on quality and performance improvements (Centers, 2017; Centers, 2016b; Porter & Lee, 2016). Yet according to the Institute for Healthcare Improvement (IHI) (2019), efforts to improve the per capita costs of care must not be pursued at the expense of patient satisfaction, quality of care, or population health. Thus, with a simultaneous pursuit of the patient experience, population health, and cost reductions, the Center for Medicare and Medicaid Services (CMS) began penalizing and rewarding hospitals, based on outcome measures and patient satisfaction scores (Austin, Bentkover, & Chait, 2016; Berwick et al., 2008; Centers, 2019b).

According to the American College of Healthcare Executives (ACHE) (2019), healthcare administrators confronted with balancing competing priorities, list top strategic concerns as the financial challenges of lower reimbursements with rising costs, government mandates, safety and quality, and personnel shortages. The pursuit of a value-based healthcare (VBHC) strategy requires an open-ended commitment to perpetual change, the adoption of value-based goals and cultural development, and a focus on keeping the patient first (Kash, Spaulding, Johnson, & Gamm, 2014; Porter & Lee, 2013). Emerging VBHC strategies are examples of management innovation, particularly complex to implement and holding a variety of different meanings to

different people (Colldén & Hellström, 2018). VBHC strategies require an increase in value to lower the overall cost of care (Kaplan et al., 2014). Value increases with lower costs, improved quality and services, and enhanced capabilities (Gambel et al., 2019). The current climate in healthcare requires a justification of activities and expenditures from every sector through demonstrations of value to the patient and the health system (Nadder et al., 2018).

Costs associated with the clinical laboratory account for only 4% of healthcare expenditures, yet drive downstream medical decisions of hospital admissions, length of stay, subsequent testing, and therapeutics (Hallworth et al., 2015; Lewandrowski, Baron, & Dighe, 2017; Warren, 2017). According to Center for Disease Control's Division of Laboratory Systems (CDC DLS, 2018), medical laboratories perform 14 billion high-quality and essential tests annually with an estimated 53% of testing performed in hospital-based laboratories (Weinert et al., 2015). Hospital executives seek value from laboratory services in the interactions with the rest of the health system (Schmidt et al., 2016). Certain laboratory activities demonstrate value by directly improving costs (Halstead et al., 2018; Price et al., 2016) while other laboratory activities improve efficiency and/or quality (Kaushik et al., 2018; Schmidt & Ashwood, 2015).

Background of the Problem

The focus of this applied business study is on the communication of Pathology and Laboratory Medicine's (PaLM) value-based activities (VBAs) to hospital administrators implementing VBHC strategies. PaLM's value contributions involve more than patient testing, although many of these activities remain poorly understood, ill defined, unrecognized, and unincentivized under existing funding models (Anonychuk et al., 2012; Price et al., 2016; St. John et al., 2015). Many PaLM VBAs target process improvements, efficiency, quality of care,

and cost reductions (Protzman, Kerpchar, & Mayzell, 2015; Schmidt & Ashwood, 2015; Van Cott, 2014; White et al., 2015;).

Implementation of a successful strategy requires linking internal business unit activities to organizational objectives (Gambel et al., 2019). Hospitals that align best practices with strategy, improve effectiveness and competitive advantage (Srivastava & Sushil, 2017). However, hospital administrators implementing the rich objectives of value-based strategies are unaware of PaLM's roles and scope of activities (Branda et al., 2014) and tend to overlook the laboratory (Downs & McMinn, 2017; Shrinkman, 2016). Hospital administrators need awareness and inclusion of the laboratory for optimal success (Misialek, 2014).

Problem Statement

The general problem is the failure of laboratory leadership to communicate PaLM VBAs to healthcare administrators, resulting in lost opportunities to demonstrate cost savings. Gross et al. (2019) discussed the need for value-defending conversations to healthcare executives from laboratory leadership, championing the laboratory as core asset of the health system, offering "high value to vast array of enterprise strategies" (p. 616). Dixon (2019) noted that laboratory leadership has failed to connect critical activities to the strategic imperatives of the broader organization. Laboratorians report increased pressures to articulate value as reimbursement policies shift from volume to value (Epner, 2017). While laboratory directors and pathologists see the value of their services, hospital administrators remain unconvinced (Small, 2016), and ineffective at explaining their full range of clinical and management activities (Burns, 2018).

Laboratory cost savings may occur as cost effectiveness, cost containment, or operational efficiencies (COLA, 2015). Schmidt and Ashwood (2015) noted that certain laboratory activities provide cost improvements. Halstead et al. (2018) and Price et al. (2016) discussed laboratory

cost savings activities as a value demonstration. Schmidt and Ashwood (2015) noted that laboratory utilization activities improve direct costs and downstream costs. Addressing test result comments reduces costs (Schmidt et al., 2016). Laboratorians demonstrate cost reduction by providing guided expertise for new technologies (Price et al., 2016) and consultative services (Davis et al., 2018; Thakkar et al., 2015). Laboratory activities associated with sourcing (Weinert et al., 2015), benchmarking (Kadauke, 2017), and data analytics (Gross et al., 2019; Xu, Higgins, & Cembrowski, 2015) demonstrate significant cost savings. Systems-based laboratory interventions produce sustained cost savings (Sadowski et al., 2017). The specific problem is that laboratory leadership in acute care hospitals fail to communicate VBAs to healthcare administrators in Texas, resulting in lost opportunities to demonstrate cost savings.

Purpose Statement

The purpose of this qualitative case study is to add to the body of knowledge by exploring laboratory leadership's communication of VBAs to hospital administrators. This problem was explored through interviews with acute care hospital administrators and laboratory leaders to discover if and how value-based initiatives are communicated. Laboratory leaders may use this information to improve communication strategies for value-based initiatives. Communicating value effectively requires research and a well thought plan (Raman, 2014). A concerted effort by laboratory leadership is required to keep senior management informed of recent developments and accomplishments (Kridelbaugh, 2018), and to align initiatives with organizational objectives and strategy (Karuppan et al., 2016; Passiment & Linscott, 2014).

Hospital administrators can use this information to gain further insight into the value contributions of PaLM services and ensure implementation of cost savings measures. VBHC strategies necessitate the identification of improvement opportunities (IOM, 2013).

Implementation success requires a clear communication plan and an alignment of leadership (Fry & Baum, 2016). Successful strategies link internal business unit activities with broader organizational objectives (Bryson, 2018; Gambel et al., 2019). Optimal success requires an alignment at all levels of the organization for better understanding, acceptance, and support of the value proposition (Austin et al., 2016).

Value must increase for the overall cost of care to decrease (Kaplan et al., 2014). VBHC delivery requires reducing costs and improving processes without sacrificing outcomes (Porter, Kaplan, & Frigo, 2017). Value increases with lower costs, as well as improved quality and services, and enhanced capabilities (Gambel et al., 2019). Certain PaLM activities demonstrate value by directly improving costs (Halstead et al., 2018; Price et al., 2016), while others improve efficiency, quality, and skills (Kushik et al., 2018; Lewandrowski et al., 2018; Schmidt & Ashwood, 2015). The literature remains sparse regarding the value contributions of laboratories, which are under recognized as an essential care component (Davis et al., 2018), and requires a broader perspective assessment (Anonychuk et al., 2012).

Research Questions

RQ1. What value-based cost savings opportunities has the laboratory leadership presented to hospital administrators?

RQ2. What value-based opportunities are perceived as effectively communicated by laboratory leaders to hospital administrators?

RQ3. How do hospital-based laboratory leaders communicate Palm VBAs to hospital administrators?

RQ4. What PaLM VBAs do administrators perceive as aligning with value-based objectives?

Nature of the Study

A carefully chosen research design forms the framework for the data collection and research questions, and the scientific structure to analyze and validate the data. The method for this research is the qualitative case study which requires gathering data and exploring situations to gain better understanding (Leedy & Ormrod, 2015). Yin (2018) warns that the qualitative case study's demands on the researcher's "intellect, ego, and emotions are far greater than those of any other research method" (p. 119), due to lack of routinization of the data collection. The case study provides an opportunity to gain insight into each case by gathering interview data from a variety of sources (Baxter & Jack, 2008). The collective nature of the multi-case study allows for analysis of individual cases, as well as a cross-case analysis (Stake, 2006).

Discussion of Research Paradigms

Qualitative inquiry research designs other than the case study include narrative, phenomenology, ethnography, and grounded theory. The narrative design distinguishes themes from interviews but is more appropriate for capturing the rich details of stories or describing the essence of an experience (Creswell & Poth, 2018). The phenomenology design seeks understanding of the essence of the phenomenon by exploring lived experiences (Creswell & Poth, 2018). Phenomenology was not appropriate for this inquiry, as the purpose of this study was to identify the communication of common VBAs among multiple sites, not to seek an understanding of lived experiences. The ethnography design was also not appropriate for this study, as it focuses on a chosen culture for understanding how a group works, exploring beliefs, behaviors, or issues (Creswell & Poth, 2018).

Two qualitative designs offer applicability for VBHC research - grounded theory (Hysong, Teal, Khan, & Haidet, 2012) and the case study (Kirkpatrick et al., 2015). Grounded

theory research is applicable for this study as the literature does not yet offer an explanation or an understanding regarding the communication of PaLM VBAs, other than analytical testing and performance. The grounded theory design allows new theories to emerge from data collections (Astalin, 2013). Grounded theory has been applied in health sciences to improve professional practices and to provide a conceptual tool to guide a future work (Butina, Campbell, & Miller, 2015). However, Creswell and Poth (2018) recommend that grounded theory studies have 20 to 60 individual interviews with clarifying re-interviews, which are not feasible due to the time constraints.

Quantitative studies include descriptive (nonexperimental), correlational (experimental), and casual comparative (quasi experimental) designs (Drummond & Murphy-Reyes, 2018). Quantitative designs permit an accurate assessment of cause-and-effect relationships between variables, seeking an explanation from causal relationships or variable correlations for a prediction, generalization, or explanation (Creswell, 2013). A quantitative design was not applicable since cause-and-effect was not the intent of this study.

Mixed-method inquiry expands and strengthens research conclusions using quantitative and qualitative research methods within a single study (Tashakkori & Creswell, 2007). Mix-method is the most comprehensive flexible design. However, as a novice researcher the management of dual methods was too difficult for this research (Creswell, 2013).

Discussion of Design

Case study permits an exploration of programs, events, processes, or activities (Creswell, 2013). Multi-case case studies address the how and why of a phenomenon, as explanatory in nature (Yin, 2014). Creswell and Poth (2018) noted that why questions suggest a cause-and-effect as directional language and recommend the use of what and how questions instead. Yin

(2014) described a collective-case design similar to the multiple-case design described by Stake (2006). The collective case study is appropriate for contemporary issues to study programs at multiple sites (Creswell & Poth, 2018), and when the subject of inquiry has indefinable cases within boundaries (Creswell, 2007: Yin, 2014). The qualitative case study is the design of choice when the problem is not understood and needs inductive research.

Discussion of Method

The employed qualitative multi-case study design was conducive to explore the phenomenon of communication between hospital laboratory leaders and hospital administrators concerning PaLM VBAs, allowing for a descriptive account from multiple cases with generalizable results (Creswell & Poth, 2018; Stake, 2006). The case study design provided an in-depth analysis of the multiple cases, using logic of replication in inquiry procedures for each case, within the well-defined boundaries of the multiple participant cases (Yin, 2014). This study did not exceed nine interviews from purposely selected cases to achieve the objective (Creswell & Poth, 2018).

Discussion of Reliability, Validity, and Triangulation

LeCompte and Goetz (1982) noted that if quantitative research had a scientific process for reliability and validity, then qualitative research requires parallel internal and external validation processes. Lincoln and Guba (1985) refined qualitative research concepts for credibility, transferability, dependability, and confirmability. Reliability in a thematic analysis involves the reproducibility of the study, ensuring a minimization of error and bias, so that another researcher repeating the same study could reach the same conclusions (Yin, 2018). Reliability in the case study design involves the protocol and the database (Yin, 2018), bringing credibility to the research with confidence in the data and the findings (Burns & Groves, 2007).

Credibility enhances with prolonged involvement, triangulation, and peer examination of the data (Baxter & Jack, 2008). The analysis of the data requires enough detail to enable the reader to determine the credibility of the methods and the interpretations (Nowell et al., 2017).

Reliability.

Reliability occurs within the interview protocols, participation packet, and approval of the human relations review board (Creswell & Poth, 2018). Reliability occurred by documenting and following the same protocol for each case and by using the same interview scripts with open-ended questions to ensure credibility and trustworthiness of the data (Castillo-Montoya, 2016; Stake, 2006; Yin, 2018). Case protocols included a pre-interview analysis of publicly reported value-based measures and site variability factors (Yin, 2018). Reliability of the interview data was enhanced with quality audio recording, same day transcription (Creswell & Poth, 2018), and use of NVivo to calculate encoding (Silverman, 2017).

Validity.

Validation is essential for the inquiry to be of value to other researchers (Creswell & Poth, 2018). The qualitative case study provided a framework for data collection and using a scientific structure for the analysis and validation of the findings (Creswell & Poth, 2018). Validity reduces the likelihood of misinterpretation (Stake, 2006). Strategies of validation attempted to assess the accuracy of the study's findings with several steps (Creswell, 2016). The researcher's philosophical orientation influences the chosen validation strategy (Creswell, 2016).

The validation strategy encompassing the reader's lens utilizes rich data and thick descriptions (Creswell & Poth, 2018) allowing the reader to make inference regarding the finding's transferability (Lincoln & Guba, 1985; Merriam & Tisdell, 2015). Validation from the reader's lens occurred with peer debriefing and allowing others to ask questions about the

methods, meanings, and interpretations (Creswell & Poth, 2018). The participant lens validation occurred by permitting participants to review his or her own interview transcript and to offer clarifying statements (Creswell & Poth, 2018). My post-positivist philosophical orientation influenced my chosen validation strategy (Creswell, 2016) of triangulation connecting the findings to corroborating evidence (Creswell & Poth, 2018; Yin, 2014).

A thick description from the researcher validates the information enabling the reader to transfer findings to other situations (Stake, 2010) as with the use of action verbs and quotes (Creswell & Poth, 2018). Grady (1998) purports that data saturation occurs at the point in which the interviewer begins to hear the same comments again and again. Hennink et al. (2017) pointed out that code saturation occurs at the point in which no additional codes are identifiable in the data set and the codebook begins to stabilize, which typically occurs with nine interviews, as opposed to meaning saturation requiring 16-24 interviews for an understanding of issues. This study utilized nine interviews to achieve data saturation with rich details from multiple perspectives. Yin (2014) points out that even within a small number of cases the concept of data saturation can be achieved.

Triangulation.

The literature was used in tandem with the newly acquired data, a process called triangulation through the researcher's lens (Creswell & Poth, 2018). Triangulation uses multiple sources, including the literature to develop a comprehensive understanding (Carter et al., 2014). Corroborating evidence for this study derived from different sources including multiple interviews within each case, evaluation of data across multiple cases, and correlation of findings with the literature (Creswell & Poth, 2018). Controversial and important findings required more than a single source as supportive evidence to ensure that meaning was not overlooked (Stake,

2006). Denzin (1989) suggested that triangulation requires two or more perspectives for correlation. Triangulation from a variety of sources promoted the credibility or trueness of the findings (Baxter & Jack, 2008). Triangulated evidence is credible and substantiated. Although Stake (2010) warns that a qualitative researcher may realize through the triangulation process that situations are more complex than initially thought and data disagreements require scrutiny.

Summary of the Nature of the Study.

PaLM practitioners live in a quantitative scientific world, performing experiments, data collections, and test validations (Butina et al., 2015). Laboratory practitioners understand the need to define the intended use of a test, examine possible sources of error from sample variation, and follow appropriate testing procedures (Jennings et al., 2009). Qualitative research methods, however, remain largely unknown in the medical laboratory profession (Butina et al., 2015). Reliability occurred in this study by repeating the same procedures for each case, utilizing quality audio recordings, interview protocols, and NVivo to calculate encoding. Multiple data sources enhanced the credibility of the findings. Trustworthiness was improved with the open-endedness of the interview questions and participants' review of transcripts for clarifications.

Validation in medical laboratories involve determining if a test is ready to be implemented into clinical practice by identifying and quantifying potential sources of variation and analyzing the closeness of agreement between a discovered value and an accepted as conventionally true value, or the reference value (Jennings et al., 2009). Similarly, validation in qualitative studies involves analyzing data for similarities and differences across cases and examining findings close in agreement with evidence from peer data. Creswell (2016) and Creswell and Poth (2018) recommend choosing at least two comfortable validation strategies considering the perspective of the researcher, the participant, and the reader. I utilized

triangulation to substantiate the evidence (Stake, 2010) and rich contextual data from purposively selected cases with a minimum of nine interviews to reach code saturation (Hennink et al., 2017).

Conceptual Framework for Communication and VBAs

"Effective communication is a prerequisite for attaining organizational goals, although it remains a significant problem" (Gardner & Winder, 1998, p. 202). The communication model by Robbins et al. (1994), shown in figure 1, provides a simplistic framework for message transfer and aids in identifying the barriers and facilitators in communication efforts (Gardner & Winder, 1998). For this study, the sender of the VBA message was the laboratory leader(s) knowledgeable of value-based cost savings opportunities, and the receiver was the hospital administrator making strategic decisions.

Figure 1.

Communication Model
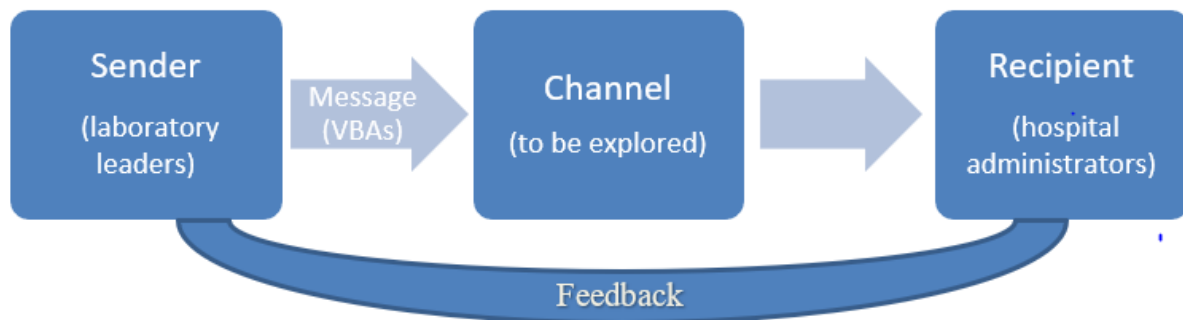
(Robbins et al., 1994), modified.

Another conceptual framework used for this study combined the concepts from Porter's value chain model (VCM) (Porter, 1985) with a contemporary healthcare activities framework developed for the Agency for Healthcare Research and Quality (Carman et al., 2014). This modified VCM (mVCM) was useful for analysis of laboratory activities within the value-chain

(see Figure 2) by outlining the basic activities that contribute value on two tracks - service

delivery and support activities (Swayne, Duncan, & Ginter, 2006). The mVCM framework offers

a "strategic thinking map for evaluating the strengths and weakness of the organization"

(Swayne et al., 2006, p. 334). The service delivery track defines the activities within service

points, i.e., the pre-service, the point-of-service, and the post-service, while the support activities

track defines the value enhancement activities that support organizational culture, structure, and

strategic resources (Burns et al., 2001; Porter, 1985; Swayne et al., 2006). The components

defined in the VCM framework are the essential elements that create value (Swayne et al., 2006).

The mVCM combines the concepts of the Value-Chain Model by Porter (1985), and the

healthcare concepts discussed by Swayne et al., (2006).

Figure 2.

mVCM Conceptual Framework for Discovery of VBAs
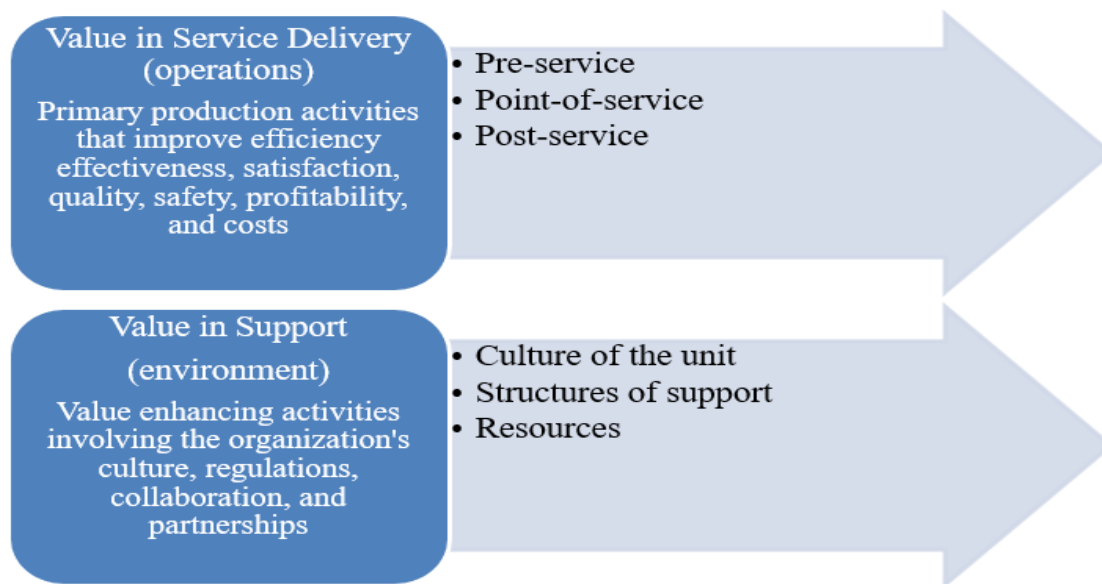
(Carman et al., 2014; Porter, 1985; Swayne et al., 2006).

The Laboratory Medicine Best Practices Phase 3 report indicates that value analytic

frameworks be used outside of laboratory medicine to increase the likelihood "that evidence of

effectiveness from these other domains will be regarded as relevant to laboratory medicine

practices" (Snyder et al., 2010, p. ix). Application of the mVCM framework aided the

identification of value-adding support activities that improve efficiency and effectiveness,

satisfaction, quality, safety, cost, as well as skills development and technological advancement

(Swayne et al., 2006). Tierney (2017) discusses a similar value realization framework for

quantifying the value associated with strategic outcomes.

Definition of Terms

1. *Analytical testing* – Analysis of human blood, body fluids, tissues, and other substances

   (Bureau, 2019; Centers, 2019c).

2. *Analytical performance* – The quality factors associated with the product of laboratory

   testing, the test result, within the total testing phases and the extra-analytical testing

   phases (Plebani & EFLM, 2017).

3. *Laboratory director* - A generic term referring to a medical physician or PhD director

   authorized by federal regulations to exercise independent medical judgment in diagnosis

   and treatment decisions relative to laboratory tests; or an administrative director,

   authorized to exercise independent technical judgment as a designee relative to policies,

   procedures, protocols, quality assurance, and other activities (College, 2018a, 2018b).

4. *Pathology and Laboratory Medicine* (PaLM) – The medical science disciplines that

   permeate all other branches of medicine with a focus on patient testing and effectiveness

   occurring in and beyond the boundaries of the laboratory (Ashwood, 2015; Davis et al.,

   2018; Schmidt &). This study makes no distinction between pathology and clinical

   laboratory disciplines, as pressures to produce and demonstrate value affect both

   (Schmidt et al., 2016). This study makes no distinction between the subspecialties of the

PaLM workforce, which according to the American Society for Clinical Laboratory

Science (ASCLS) (2018) is made up of pathologists in clinical and anatomic disciplines,

pathology assistants, cytologists and histologists, doctorate clinical laboratory scientists

(DCLS), medical laboratory scientists (MLS), medical laboratory technicians (MLT),

laboratory assistants, and phlebotomists. According to Wolcott et al. (2008) each has a

vital role in the delivery of quality healthcare, managing and applying evidence-based

testing that supports patient care and protects the public's health. A high functioning

laboratory requires a complex mixture of skill sets to function seamlessly as a team

(Kroft, 2018).

5. *Value-based activities* (VBAs) – Activities that improve value, identifiable within the

   value-chain (see Figure 2). VBAs encompass a variety of concepts, tools, and models

   generally referred to as improvement approaches (Colldén et al., 2017). VBAs add value

   by transforming patient care, materials, information, decisions, or risks. Other types of

   activities are enabling which are necessary to complete a care cycle process, or nonvalue-

   adding which unnecessarily consume resources (Tierney, 2017). VBAs result in

   improvements in quality, the patient experience, or costs (Øvretveit, 2009). Kirkpatrick et

   al. (2015) used VBA to describe *value-based analysis,* a management strategy to

   determine the change in value, measured in the cost reductions and quality

   improvements, occurring when a best practice replaces a usual practice.

6. *Value-based strategy* – A strategy that lowers costs, improves quality or the provision of

   service excellence, or surpasses rival capabilities (Gambel et al., 2019). The delivery of a

   VBHC strategy requires improving processes and reducing costs without sacrificing

   outcomes (Porter et al., 2017). At the time of this study some hospitals were beginning to

establish value management offices; however, most still "cannot articulate or demonstrate value" (Tierney, 2017, p.22).

Assumptions, Limitations, Delimitations

Assumptions are somewhat out of the researcher's control, yet without them, the study becomes irrelevant (Simon, 2011). The assumptions of interest include only those that affect the quality of the structure, within the reasoning of conclusions or in an argument where ambiguity exists (Brown & Keeley, 2007). The assumptions of this study include those relative to the chosen method, the data collection, and the analysis. Limitations expose a potential weakness and delimitations define the boundaries and scope of the study (Simon, 2011).

Assumptions

It was assumed that hospital site administrators would grant access for this study, and that laboratory leaders and administrators would participate by answering interview questions truthfully. Assumptions also included that hospital-based laboratory leaders were aware of and contributed to value-based initiatives and had knowledge of PaLM VBAs within their organization. It was assumed that a cross-case analysis of an adequate sample size would detect communication themes of PaLM VBAs (Yin, 2014). A key assumption was that the chosen hospital cases in this multi-case study were representative of the larger population of acute care hospitals. I also held the assumption that the findings would benefit the industry and contribute to the broader body of knowledge. Further assumptions were that PaLM VBAs contribute value in healthcare in accordance with the literature, at least in part by improving satisfaction, effectiveness, efficiency, and/or costs reduction.

Limitations

Limitations beyond the researcher's control need to be revealed to the readers and

participants of the case study (Brutus, Aguinis, & Wassmer, 2013; Simon, 2011). The research

questions limit the findings of a case study (Creswell & Poth, 2018). A potential for error was

thought to exist the inability of participant(s) to describe VBAs based on the interview questions.

Interpretations may be limiting as findings depend "on the experience of the researcher, the

experience of those being studied, and the experience of those to whom information will need to

be conveyed" (Stake, 2010, p. 199). Additionally, interviewees were not equally communicative

or responsive in depth to the interview questions (Creswell, 2007). While I had knowledge of

most PaLM workflows and VBAs, I was limited in experience on the communication of value or

the perceptions of hospital administrators.

Delimitations

The cases chosen for this study were bound by acute care-type hospitals. The purposively

selected hospital cases were bound by provision of acute care with on-site emergency and

laboratory services, and online access to PaLM results. Case bindings ensured that participant

hospitals were similar, improving the generalizability of the findings. Any transferability of the

findings to other hospital types depends on the prudent judgment of the reader.

Significance of the Study

Implementation of a successful VBHC strategy requires effectively communicating the

plan at all levels of the organization, and leaders that model "how to act in line with the plan" (Fry

& Baum, 2016, p.148). This study adds to the body of knowledge by expanding the understanding

of the communication of PaLM VBAs to hospital administrators, furthering an appreciation of the

laboratory's vital role and recognition of this important work (Adeli, 2017). Understanding

PaLM's value contributions is vital for ensuring the provision of services, optimal use of testing, and minimization of resources and financial waste (Hallworth et al., 2015). Reengineering of clinical and administrative processes is the best opportunity for lowering healthcare costs without sacrificing quality, safety, or outcomes (Kaplan et al., 2014).

Laboratory leaders need to be more knowledgeable of the programs designed to increase value and reduce waste and need more proactive communication of their value contributions (Schmidt & Hussong, 2016). When operational awareness increases and the contributions of employees are recognized, worker engagement and retention improve (Harrison, 2010; Phipps, 2016). Recognition and appreciation improve the support necessary for the adoption and continuation of VBAs (Carman et al., 2014).

Reduction in Literature Gaps

The literature reviewed at the time of this study offers no research regarding the efforts of laboratory leaders to communicate value to hospital administrators. The evidence of the communication of VBAs gathered in this study adds to the body of knowledge. Generating evidence of the value contributions from healthcare systems fills knowledge gaps and fosters continuous learning (Montori et al., 2019). It is expected that this study will further the understanding of the communication of PaLM's value contributions in healthcare.

Implications for Biblical Integration

Everyone has philosophical assumptions (Creswell & Poth, 2018) and, either consciously or subconsciously, a worldview (Tackett, 2006). Those who grasp the worldview concept and reflect seriously on the subject, develop a more coherent belief system (Samples, 2007). The Christian worldview, also called a biblical worldview, provides an overarching assumption of God as the Creator (Genesis 1:1; Genesis 1:26-27). Of the Creator, Nehemiah 9:6 says, "You alone are

the Lord. You have made the heavens. The heaven of heavens with their entire host, the earth, and

all that is on it, the seas, and all that is in them. You give life to all of them, and the heavenly hosts

bow down before You." (*New American Standard Bible*, 1960/1995). The Christian worldview

provides a foundational reality with moral absolutes and truths, and a framework for the meaning

of life, and life after death (Barna, 2003). This master narrative describes what human life should

be like, what knocked things off balance, and how to make things right again (Smith, 2009). A

Christian worldview does not necessarily conflict with academia, but rather provides a way to live,

steeped in integrity and offers a comprehensive understanding of all aspects of creation (Dockery

& Thornbury, 2002). The authority of scripture is foundational, perhaps described best by C.S.

Lewis (n.d.) who said, "I believe in Christianity as I believe that the sun has risen, not only because

I see it, but because by it I see everything else" (p.1).

Regardless of one's religious orientation, all of humanity is inherently hard-wired to create

and to desire meaningful work (Genesis 2:15; VanDuzer, 2010). Humanity, created in God's

image, is inherently gifted to do excellent work, even non-believers through grace and providence

(Keller & Alsdorf, 2012). God defines the value of His work as "very good" in Genesis 1:31. As

a reflection of His image, we are designed and assigned to create value, bring order, and

communicate with others (Genesis 1:27; Van Duzer, 2010). Studies show that spirituality in

healthcare plays an important role in *whole being care* and positively influences organizational

performance (Brémault-Phillips et al., 2015), as well as the patient experience (Graber & Johnson,

2001). Realization and appreciation of personal spiritual depth increases leadership capacity and

productivity (Byrum, 2004).

Benefit to Business Practice and Relationship to the Cognate

The field of study reviewed is healthcare administration. The business practice analyzed is organizational communication and the knowledge of VBAs required for VBHC strategic implementation. Implementation of a successful VBHC strategy requires an effective communication plan at all levels of the organization" (Fry & Baum, 2016, p. 148). Implementation success requires linking internal business unit activities to organizational objectives (Bryson, 2018; Gambel et al., 2019). VBHC creates an imperative for organizational cooperation and teamwork (Nilsson et al., 2017). Effective internal communication is necessary for strategic consensus. A limited knowledge of strategic priorities leads to an underestimation of the priority's relevance (Desmidt & George, 2016), whereas an overestimation is detrimental to resource allocation (Saaty, 2008). If internal communications are failing then several other areas will be too (Hartland, 2018).

Viability in a VBHC environment requires the identification of improvement approaches yielding net cost savings (IOM, 2013). Understanding PaLM's value contributions is vital for ensuring the provision of services, the optimal use of testing, and the minimization of resources and financial waste (Hallworth et al., 2015). Reengineering of clinical and administrative processes offers the best opportunity for lowering healthcare costs without sacrificing quality, safety, or outcomes (Kaplan et al., 2014). VBHC implementation requires energy, teamwork, employee engagement, and conversations about cost (Van Engen et al., 2022). Healthcare administrators are still discovering appropriate organizational responses to VBHC (Spaulding, Edwardson, & Zhao, 2018). Administrators implementing VBHC strategies must carefully consider the internal strengthening actions, resource allocations (Bryson, 2018), and weaknesses of the organization (Karuppan et al., 2016).

Summary of the Significance of the Study

Hospital administrators lack a clear understanding of the value streams or the interconnectivity of processes in hospitals (Protzman et al., 2015). The value-adding services of hospital laboratories (COLA, 2015) need to be communicated to hospital administrators making strategic decisions. Researchers of medical laboratories point toward value creation in the vast amounts of patient laboratory test data, which offers insights for patient diagnosis, care management, population care, risk stratification, and evidence-based clinical guidelines (Kim et al., 2011; Hallworth et al., 2015; Sikaris et al., 2017; Swanson et al., 2018). Other researchers focus on PaLM's value in terms of personalized medicine, genomics, pharmacogenetics, and utilization relative to the cost of care (Crawford et al., 2017; Zhi et al., 2013). To improve the communication of value, an understanding of stakeholders and how information reaches them is necessary (Raman, 2014). Certainly, the communication of value depends on the perspectives of the stakeholders (Raman, 2014), but the recognition of value is the critical first step in achieving successful evidence-based policies, leading to more cost-effective and high-value healthcare (Misialek, 2014).

A Review of Professional and Academic Literature

Scholarly literature was essential for gaining a better understanding of the communication of value-based initiatives by PaLM leadership. As this study was focused within the acute care hospital setting, the value discussed falls under the Medicare Hospital Value Based Payment (VBP) program, which financially incentivizes improvements in outcomes and safety, engagement, efficiency, and cost reductions (Centers, 2019b). A hospital's value is currently defined by Medicare in quality star ratings (Centers, 2021). Hospital executives seek value from PaLM services in the interactions with the rest of the health system (Schmidt et al.,

2016), although value in healthcare is an ambiguous concept embracing most everything good

(Colldén, Gremyr, Hellström, & Sporraeus, 2017). Defining value as quality/costs presents

difficulty due to the soft descriptives of safety, effectiveness, efficiency, and satisfaction

(Kirkpatrick et al., 2015). Additionally, value can mean many things for patients (Nilsson,

Bääthe, Andersson, & Sandoff, 2017).

PaLM Roles and Responsibilities

Evidence indicates that the responsibilities and roles for laboratorians are evolving (Lippi

& Mattiuzzi, 2019) and the lines of subspecialties blurring (Wilson, 2014). The term laboratory

professional is broad (Straseki, 2013). Nine different boards certify laboratory directors (Centers,

2020), representing more than 24 pathology and medical organizations (Lorenz et al., 2018). The

changing scope and roles within PaLM are increasingly important regarding the contributions of

useful information and presentations of economic value (Pennestri & Banfi, 2019). However,

U.S. insurers offer little incentive for the pathologist to participate in hospital improvement

projects by reimbursing only anatomic work (Laposata, 2018a). While pathologists can

demonstrate value by communicating effectively and being involved in activities (Wagar,

Eltoum, & Cohen, 2019), most hospital pathologists already have *a day job* with little time left to

devote elsewhere (Henricks et al., 2015).

The non-pathologist laboratorian plays a role promoting patient safety and quality of care

(Kim et al., 2011). The advanced practice doctorate clinical laboratory scientist (DCLS) offers a

new leadership role capable of communicating value by optimizing test selection and utilization,

interpreting test results, and participating on medical care teams as a diagnostic expert (Laposata,

2018b; Nadder et al., 2018; Rutgers, 2017; University of Kansas, 2018; University of Texas,

2017). The advanced practice DCLS may hold roles as an educator, consultant, and/or

administrator (Nadder, 2013; Rutgers, 2017), playing a vital role in cost-effectiveness, error

reduction, and improved patient outcomes (Nadder, 2013). Non-pathologist laboratorians are

involved in computational pathology as new roles emerge for biomedical informaticists,

computer scientists, mathematicians, and statisticians (Louis et al., 2016). The senior

credentialed clinical laboratory scientist (CLS) supervising test quality in the accredited

laboratory participates in many aspects of results interpretations and communicates with nurses

and doctors (Unsworth & Lock, 2013; Wagar et al., 2019). CLS managers apply improvement

approaches daily, aimed at increasing value in a variety of ways (Colldén et al., 2017). As a

motivator, the laboratory manager needs effective communication skills to oversee, lead, coach,

and train (Otto, 2017). These varying types of laboratory leaders and roles set the culture and

pace of the department (COLA, 2015).

The Value Chain

The literature provides clear evidence of healthcare value relative to improvements in

productivity, clinical quality, safety, patient and staff satisfaction, and cost efficiencies

(D'Andreamatteo et al., 2015). Pfannstiel & Rasche (2017) discussed a service business model

for healthcare requiring a focus on value creation with a two-dimensional value proposition – the

operational dimension involving the VBAs that improve quality and safety, efficiency,

effectiveness, satisfaction, profitability, and cost containment, and the environmental dimension

with enhancements to the organization's culture, policy and procedures, collaborations, and

partnerships. Similarly, Porter's (1985) value-chain includes a service delivery and support track

for the evaluation of value creation. A modified value-chain model (mVCM) provides guidance

for assessing the literature, aiding discovery of some types of service and support activities (see

Figure 2). Although not always apparent, the activities in the value chain are critical in value

creation for an efficient and effective organization (Swayne et al., 2006). Strategic planning

efforts require analysis of the internal business environment, resources, and capabilities;

beginning with the identification of key internal factors that contribute value to the organization.

Internal activities are part of larger processes, needing to be designed and managed to deliver

optimal customer value. Hospital operational units provide a strategic advantage by developing

superior operations in service quality, costs, on-time delivery, and flexibility (Karuppan et al.,

2016).

Value improves with lower costs, quality improvements, service excellence, and

surpassing the capabilities of rivals (Gambel et al., 2019). These categories within the value-

chain are the essentials for value creation (Swayne et al., 2006). Yet, the real value contributions

from PaLM practices still need understood, defined, communicated, and applied for all

stakeholders (Price et al., 2016). Laboratory medicine is an area where laboratorians have an

opportunity to demonstrate value in the delivery of healthcare (Schmidt & Ashwood, 2015),

especially when rethinking the full continuum of care (Porter & Lee, 2016). VBA assessments,

including those for hospital laboratories, provide evidence for incorporation into practice and

alignment with value-based strategies (Carman et al., 2014).

VBA Knowledge Sharing.

Medical knowledge and accepted practices change rapidly as the volume of research

expands exponentially (Duke, n.d.). Research findings are slow to integrate, taking an average of

17 years for integration into medical policy and practices (Morris, Wooding, & Grant, 2011).

Knowledge dissemination improves operations, refining and updating the organization with

improved skills and methods (Grove et al., 2019; Lewandrowski et al., 2018; McFadden, 2014).

Laboratory leaders can serve as knowledge brokers that rapidly translate evidence-based

practices in healthcare (Birken et al., 2018; Price & St. John, 2014), serving as the go-betweens

of the knowledge producers and the end users (Puddy & Hall, 2017). The role of the middle

manager as a knowledge broker shapes the climate for implementations (Birken et al., 2018).

Knowledge brokers translate and implement new knowledge transferring industry knowledge

between and across systems (Puddy & Hall, 2017).

Laboratorians provide expert knowledge on miniaturized point-of-care testing platforms

associated with improvements in service delivery and wait times, which need to be weighed

against the limitations of testing accuracy and costs (Nadder et al., 2018). PaLM's expertise

connects science with medicine, integrating and upgrading healthcare policies and practices

(Grove et al., 2019; Lewandrowski et al., 2018; Morris et al., 2011), as well as clinical guidelines

(Eaton et al., 2017; Misra et al., 2016; Sikaris, 2018). Many laboratory VBAs target process

improvements for better efficiency, quality of care, and cost reduction (Protzman et al., 2015;

Schmidt et al., 2016; Van Cott, 2014; White et al., 2015).

VBA Utilization.

Best estimates indicate that 30% of laboratory test orders are inappropriate (Baird et al.,

2018). Government payers attempting to control laboratory expenditures simply reduce

reimbursement rates, without consideration for medical necessity (Wilson, 2015). As a result,

laboratories expect a 15% decline in reimbursements by 2023 (Halstead et al., 2018). Porter et al.

(2017) suggests that such arbitrary spending reductions lack sustainability and may even harm

patient outcomes. VBAs associated with test utilization and demand management are a more

effective way to decrease the associated costs in hospitals and outpatient settings (Lewandrowski

et al., 2017; Wilson, 2015). Successfully tackling inappropriate laboratory utilization requires

laboratory leaders to drive this process improvement effort, analyze the data, and communicate

with physicians and other stakeholders (Lewandrowski et al., 2017; Sadowski et al., 2017).

VBA Efficiency and Effectiveness.

Laboratory services affect hospital reimbursement in clinical care process domains, i.e.,

efficiency, patient experience, outcomes, and cost reductions (Davis et al., 2018). Efficient

organizations seek to improve processes, complications, and time (Worster, Weirich, & Andera,

2017). Efficient organizations eliminate the duplication of services, products, or delays (Inal et

al., 2018), and utilize contractual relationships to minimize cost (Harrison, Harrison, Howey, &

Walters, 2017; Schwartz & Pearson, 2013); although only half of U.S. physician societies

consider costs when developing clinical guidelines (Schwartz & Pearson, 2013). Efficient

laboratories utilize a managerial focus on operations (Schmidt et al., 2016) with autoverification

of test results (Krintus et al., 2017). Effective organizations utilize best practices (Srivastava &

Sushil, 2018) and develop a culture of learning continuous improvement, optimization of

clinical, economic, and operational outcomes (Glanzman, 2017; Hallworth et al., 2015; Swayne

et al., 2006).

VBA Competitiveness and Customer Services

Value enhancements involve improving strategic resources and core competencies of the

organization, i.e., internal skills, capabilities, and technologies (Fottler, Ford, & Heaton, 2002;

Kratz & Laposata, 2002; Swayne et al., 2006). Internal resources and capabilities require

development and nurturing for a sustained competitive advantage (Gambel et al., 2019).

Successfully achieving a strategic vision requires development of internal capabilities and

effective managerial talent (Gambel et al., 2019). Skills and knowledge are developed with

activity implementations and experience-based learning with adequate time to reflect-on

outcomes (Kim, Kumar, & Kumar, 2012; Nilsson et al., 2018).

Realization of PaLM's value proposition requires working with hospital administrators

and colleagues (Louis et al., 2016). Laboratory's visibility, within and outside the organization,

improves with value-added services like consultations, team efforts, and research projects

(COLA, 2015). Laboratorians demonstrate clinical expertise participating on multidisciplinary

teams (IOM, 2015; Wagar et al., 2019), providing consultations (Davis et al., 2018;

Fydryszewski, 2019; Laposata, 2018b), and liaising with physicians and nurses (Unsworth &

Lock, 2013; Wagar et al., 2019). Laboratory professionals add value in healthcare as clinical

consultants, sharing clinical expertise on care teams, tumor boards, infection prevention

committees, clinical utilization and antibiotic stewardship committees, performance

improvement teams, and transfusion management programs (Davis et al., 2018; Morgan, Malani,

& Diekema, 2017). Laboratory expertise improves patient outcomes, reduces infections, and

increases throughput (Gupta et al., 2019). The hospital-based pathologist participates on

interdisciplinary committees, interacting with clinicians and engaging in the broader role of

healthcare (Wilson, 2014). The CLS offers valuable expertise for test selection and

interpretation, reducing diagnostic errors, and avoiding unnecessary testing (ASCLS, 2018).

VBA Quality Testing and Data.

The value of the laboratory test is in the information communicated from the test result,

which enables clinicians to make better patient treatment decisions that positively affect clinical

outcomes (Price & St. John, 2014). Laboratory test results gauge the effectiveness of nutritional

and medical treatments such as drug or cancer therapies and the source of infection for antibiotic

therapies (ASCLS, 2005). Laboratory diagnostic testing provides real-time decision support to

clinicians (Schmidt et al., 2016), informs patients and providers of disease states and disorders, and monitors the efficacy of treatment (Collinson, 2017; Nam, 2015). The diagnostic value of the laboratory testing has been explored in a number of papers (Price & St. John, 2014).

The analytical dimension of laboratories are arguably the best performing sector of healthcare (Hawkins, 2012), given that medical laboratory testing is among the most regulated and inspected areas of healthcare, and the high quality of testing is well developed and efficient (IOM, 2015; Schmidt & Ashwood, 2015). Laboratory accreditation bodies have clear standards for testing and for testing personnel (Centers, 2019c; COLA, 2019a; Hawkins, 2012). The Food and Drug Administration regulates four categories of patient testing complexity (Lorenz et al., 2018). Accreditation bodies such as the College of American Pathologists (CAP), the Joint Commission (JC), the Joint Commission International (JCI), COLA, and others have clear standards for human specimen testing, and the personnel that perform and interpret test results (Centers, 2019b; COLA, 2019; Hawkins, 2012). The optimal analytical performance depends on quality assurance standards within the total testing phases, as well as extra-analytical performance specifications (Plebani & EFLM, 2017). Many quality and cost savings opportunities exist in the management of the extra-analytical phases of laboratory testing (Hawkins, 2012; MacMillan, 2014; Waibel et al., 2018).

PaLM is a data driven specialty and pathologists are information specialists (Henricks et al., 2015; Wagar et al., 2019). Medical laboratorians are not merely generators of data, but managers of information and creators of knowledge (Kroft, 2018) with the adequate skill set and expertise for population health management strategies (Swanson et al., 2018), and provider education (Wagar et al., 2019; University of Kansas, 2019). Data whether clinical, financial, or process related, needs to be collected, analyzed, and protected as a resource for managing care,

improving processes, and generating knowledge (IOM, 2013). Laboratory data analytics generate

the knowledge for cost reductions in healthcare (Xu et al., 2015), as well as improvements in

utilization, quality, service efficiencies, and health outcomes (Shirts et al., 2015). Analysis of

laboratory testing data identifies the opportunities to improve utilization, service efficiency, and

meaningful use (Shirts et al., 2015). It identifies gap areas for risk stratification and improving

outcomes (Ducatman et al., 2018; Gross et al., 2019). The value of the laboratory becomes more

transparent as health systems delve into population health strategies (Downs & McMinn, 2017).

The term *big data* in healthcare refers to the collection of information so large that

bioinformatics solutions are required to process and make meaningful (Baudhuin, 2015).

Advances in data analytics permit the examination of laboratory's *big data*, identifying value-

based opportunities (Nadder et al., 2018). Impacts from laboratory data are associated with

quality assurance, process improvements, epidemiology, population health, and predictive

modeling (Crawford et al., 2017; Fitzgerald et al., 2018; Turi, Buchner, & Grigsy-Toussaint,

2017). Pathologists as champions need to communicate the value of the laboratory's data to

administrators (Gross et al., 2019).

VBA Cost Savings.

Cost effectiveness requires improvement in operational efficiencies, quality, and per unit

costs, and guidance by competent laboratory management (COLA, 2015). Cost effectiveness

involves assessing laboratory services for competitiveness, pricing, and profitability (Downs &

McMinn, 2017). Cost savings come in the form of cost containment, cost effectiveness, or

operational efficiency (COLA, 2015). The University of Mississippi's laboratory system

identified four types of cost saving activities: a realized savings with a duplication order alert; a

prospective cost savings with an unnecessary combination alert; a downstream cost savings

utilizing expertise in new instrumentation projects; and a variable cost savings assessing laboratory data to justify process changes (Shirts et al., 2015). Laboratory cost reductions contribute to organization-wide savings (Futrell, 2013). The total costs of care are reduced by VBAs that improve purchasing processes, productivity, or the utilization of equipment, facilities, or services by enhancing quality (Kim et al., 2012; Niemeijer et al., 2011). Sustainable cost reductions require the identification and modification of inefficient and ineffective processes (Porter et al., 2017).

Laboratorian expertise is instrumental in the identification, prioritization, and selection of improvement initiatives (Raebel et al., 2019). Competent laboratory management assesses marketplace pricing for relative competitiveness (Bergeron, 2017) and identifies opportunities within the supply chain (Passiment & Linscott, 2014). PaLM plays a significant role in VBHC with investigation of new tests and methods, dissemination of information, and guiding appropriate utilization as well as pricing and reimbursement assessments, stewardship programs, and consultations (Halstead et al., 2018; Lewandrowski et al., 2017).

VBHC Strategies

VBHC strategies require changes that increase value and lower the overall costs of care (Kaplan et al., 2014). However, the first step in any performance improvement initiative is convincing others of a need for change (Green, Greene, & Orsini, 2018). Hospital reimbursements depend on maximizing operational efficiency, improving quality, and reducing unnecessary costs (Hamrock et al., 2013). A hospital's ability to score well under VBHC reimbursement models depends on the organization's ability to learn and implement change (Spaulding et al., 2018). Delivery of VBHC is an uphill battle without improving workflow efficiencies and communications (Lord, n.d.). Successful strategies link internal business unit

activities with organizational objectives (Gambel et al., 2019; Bryson, 2018). However, the complexities of a healthcare organization necessitates that each level take responsibility in strategy implementation (Batalden & Davidoff, 2007; Nilsson et al., 2017).

While the work of transitioning from volume-based to value-based healthcare is well underway, the associated challenges should not be underestimated (Porter & Lee, 2016; AHA, 2017). The complexity and pace of the changes required result in all levels of the organization feeling stress, frustration, and confusion (Chatfield et al., 2017; Delmatoff & Lazarus, 2014). A hospital's implementation success requires clear communication and an alignment of leadership (Fry & Baum, 2016). Service improvements within hospitals require resolution of key sources of tension (D'Andreamatteo, Ianni, Lega, & Sargiacomo, 2015). All staff have a hospital citizenship role and a responsibility in the improvement of care and performance (Boland et al., 2017). Strong leaders understand the factors affecting their employees, and the contributions toward good citizenship behaviors (Glavas & Goodwin, 2013; Henderson-Carter, 2014).

VBHC Implementation.

Viability in a VBHC environment, especially in a rural hospital setting, requires identification of improvement approaches to reduce waste, improve outcomes, and yield net cost savings (IOM, 2013). Evidence based assessments encourage the practice or policy changes necessary to increase value (Swayne et al., 2006). The dissemination of performance measure data is not enough to produce improvements (Lemire et al., 2013). Successful improvement initiatives depend on a variety of factors that influence the reactions to performance information, such as the clarity of objectives, stakeholder relationships, systems of governance, and incentives (Lemire et al., 2013). A supportive communication network, teamwork, and staff satisfaction are essential (Becket & Kipnis, 2009).

Studies indicate that hospitals belonging to a system are more likely to score high on value-based purchasing performance (Spaulding et al., 2018). Integrated delivery systems effectively minimize transaction costs with an improved coordination of care (Harrison et al., 2017). Some administrators seek acquisition or merger in hopes of delivering lower costs with economies of scale (Knowles & Barnes, 2013). However, the relationship between cost and increased volume is not linear (Knowles & Barnes, 2013). Despite moving target measures, hospitals belonging to a system demonstrate better change management efficiencies by internal learning from other sites (Spaulding et al., 2018). Transferring information to other units shortens the improvement cycle (Green et al., 2018).

VBHC Organizational Alignment.

Organizational alignment in VBHC requires that all levels of the organization understand, accept, and support the value proposition (Austin et al., 2016). Generating alignment is the primary objective of internal communication (Verčič, Verčič, & Sriramesh, 2012). Davis et al. (2012) purported that internal information sharing with top executives fosters a closer agreement in the strategic vision. Both informational and relational dimensions play a role in generating organizational alignment (Desmidt & George, 2016). Ideally, the entire organization keeps a watchful eye on opportunities, risks, and trends as organizational transformation requires a team effort (Chatfield et al., 2017; Stroh, 2015).

The Hospital Administrator

Healthcare administrators' top strategic concerns are the financial challenges amid lower reimbursements and rising costs (ACHE, 2019). Executive leadership must set the objectives to lower costs and increase value (Kaplan et al., 2014). Healthcare administrators implementing a value-based strategy must carefully consider the specific internal strengthening actions and

resource allocations necessary for success (Bryson, 2018). Influential factors in the adoption of improvement initiatives include the characteristics of the hospital's top management team, the structure and size of organization, and the local competition (McFadden et al., 2014). Hospital decision makers need a better understanding of the role and the value offered by laboratories (Anonychuk et al., 2012). Understanding the current set of business activities is necessary to justify change (Orwig et al., 2015).

Most executive teams focus on improving quality, efficiency, and reducing costs (Green et al., 2018). Hospital accreditation requirements, government mandates, and financial incentives determine the reportable measures chosen by a health system's leadership (Tierney, 2017; Tinker, 2018). Top concerns of hospital administrators include government mandates, financial challenges with lower reimbursements and rising costs, the need to improve safety and quality, and personnel shortages (ACHE, 2019; Newman, 2018). The hospital CEO focuses on patient experience and satisfaction, clinical quality, and cost reductions through process improvements (Marlow et al., 2016). The executive level administrator is the organization's primary strategic decision maker (Bryson, 2018), choosing which outcomes to measure with consideration of the availability and ease of access to the necessary data (Nilsson et al., 2018).

Healthcare executives moving from volume to value-based care acknowledge new complexities and challenges to long-term financial stability of hospitals (DeMarco et al., 2016). Healthcare administrators are still discovering the appropriate responses to value-based purchasing and the necessary organizational behavior adjustments (Spaulding et al., 2018). CEOs acknowledge that better outcomes at lower costs are achievable with improvement initiatives (Cosgrove et al., 2012). Hospital CEOs agree that strategy development must occur at "multiple

levels and involve as many stakeholders as possible" (Chatfield et al., 2017, p. 376). Figure 3

lists the top improvement concerns for hospital administrators in the VBHC era.

Figure 3.

Hospital Administrator's Top Concerns
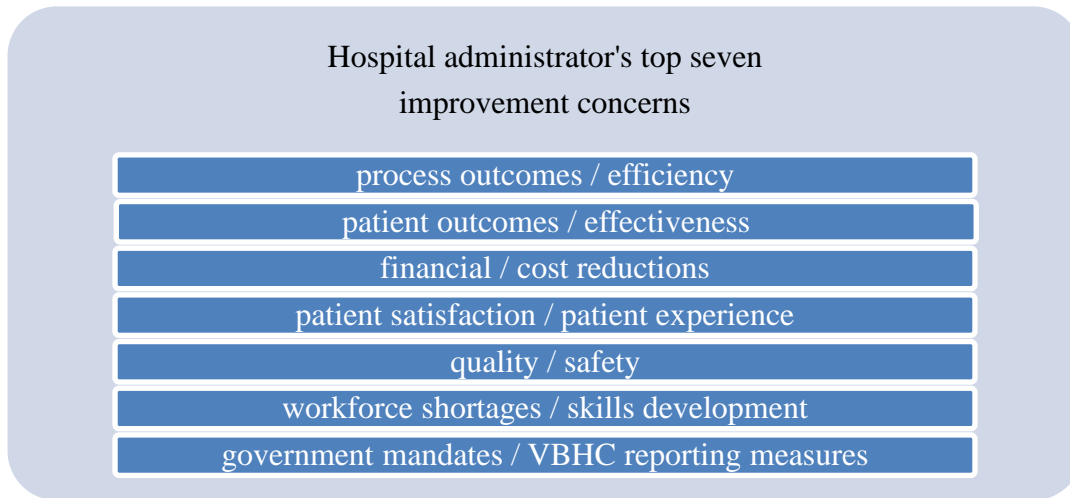
Communication.

Healthcare administrators are responsible for setting the goals and objectives that

increase value in care delivery, as well as allocating resources and evaluating performances for

improved outcomes and lower costs (Kaplan et al., 2014; Kim et al., 2012). A superior execution

strategy strives for continuous improvement within the value-chain, aiming for operational

excellence (Gambel et al., 2019). Strategy implementation requires experience, knowledge, and

charisma (Harrison, 2010). Healthcare administrators agree that as change agents they hold the

responsibility for communicating changes to staff in an understandable way, with frequency and

using multiple methods for optimal effectiveness (Salahshor, 2016). The CEO plays a key role in

fostering a culture of upward communication (Adelman, 2012; Ashford, Sutcliffe, &

Christianson, 2009), although most of the responsibility for improving upward communication

falls on the managers (Alder, Maresh-Feuhrer, Elmhorst, & Lucas, 2019). Upward

communication occurs more frequently with executive leadership that is genuine, visible, and

approachable (Adelman, 2012). CEOs that openly address bad news create a transparent culture,

allowing for critical upward feedback (Aldeman & Stokes, 2012). The leaders that build

relationships, establish trust, and remain visible to staff encourage feedback for improvement

ideas and concerns (Aldeman & Stokes, 2012). Communication is particularly important when

change involves controlling costs and resource allocations (Madden, 2015). Healthcare

administrators use leadership skills to engage staff in meeting goals (Salahshor, 2016) and

managing change (Liang et al., 2013). Senior level *gemba* walks improve accessibility for

communicating with frontline employees and demonstrate the commitment of senior leaders

(Protzman et al., 2015). While top-level personnel are responsible for strategic planning and

formulation, the lower-level members implement strategic activities and hold the responsibility

for customer service relationships (Davis, Allen, & Dibrell, 2012).

Frontline Inclusion.

Organizational leadership must ensure the necessary partnerships for the laboratory

(Warren, 2013). Executive administrators acknowledge that employees are experts about what is

happening in the organization (Adelman & Stokes, 2012). An engaged workforce is necessary

for clinical and financial excellence (Adelman & Stokes, 2012). Failure to include the hospital

frontline in discussions of improvement efforts result in staff feeling "demotivated,

disenfranchised, and disenchanted" (Longenecker & Longenecker, 2014, p.8). Administrators

cannot fix organizational deficiencies without tapping into departmental knowledge (Salahshor,

2016). Hospital administrators can leverage front line intelligence to improve safety,

engagement, and identify the areas of vulnerability (Wolpaw et al., 2018).

Perceptions of PaLM Services.

The relative spend on medical laboratory diagnostics compared to pharmaceuticals reveals an under-appreciation of the economic and medical value delivered (Jordan et al., 2015). The paucity of evidence demonstrating PaLM's impact on healthcare costs and outcomes contributes to the under-recognition and under-valuation of PaLM services (Anonychuk et al., 2012). Most hospital administrators have little understanding of laboratory practices, the associated component costs (Lewandrowski, 2017), or the scope of activities (Branda et al., 2014). Administrators lack a clear understanding of the value streams or the interconnectivity of processes (Protzman et al., 2015). When tasked with improving quality and decreasing costs, hospital groups need an awareness of the PaLM's role and an inclusion of the laboratory for optimal success (Misialek, 2014).

Hospital administrators often overlook the laboratory (Downs & McMinn, 2017; Shrinkman, 2016), and may wonder if laboratory services are merely "a commodity or if laboratory services offer a higher valuation" (Crawford et al., 2017, p.2). Administrators may wonder if PaLM services offer enough value to stay "safely ensconced within the facility" (Futrell, 2013, p.2). In a 2016 survey of laboratorians nearly two-thirds of respondents indicated feeling administrative pressure to demonstrate the laboratory's value and to cut costs (Epner, Gayken, & Kurec, 2019). Hospital leaders fail to recognize the value of laboratorians and pathologists (Gross et al., 2019). They may even relegate the laboratory department to a cost center position, such as linen or laundry services for potential of outsourcing as a cost savings measure (Downs & McMinn, 2017; Mrak, Parslow, & Tomaszewski, 2018).

Laboratory management constrained by space, a lack of qualified personnel and technology, and regulated mandates face tough choices (Weinert et al., 2015). For example,

sourcing decisions need to be weighed against stakeholder needs and per test cost (Weinert et al., 2015). Outsourcing tests may improve costs (Roger et al., 2019), but may also negatively affect patient care with decreased sample quality, delays in result time (Weinert et al., 2015), and increased test cancellations (Rogers et al., 2019). Outsourcing of tests enhances the risk for diagnostic errors (Lippi & Mattiuzzi, 2019) and interrupts the continuity of care (Ferraro & Panteghini, 2017). Outsourcing of laboratory services foregoes the seamless provision of services, integration of data, and timeliness of patient reporting (Terese, 2019). STAT turnaround time, one of the most visible performance measures (Hainen & Coberly, 2018) remains a high-priority reportable quality measure in CMS's Merit-based Incentive Payment System (MIPS) (CAP, 2019b).

The people assets of laboratories are also undervalued (Tulsi, 2019) despite their high-quality work contributions toward the diagnosis, prognosis, treatment, and management of human disease (Davis et al., 2018; Anonychuk et al., 2012). Administrators tend to link cost savings to personnel reductions or reductions in required educational standards for employment, foregoing the potential negative impacts on patient outcomes (Epner, 2017). Higher-level directors may not see the value from the insights of lower-level employees (Ahmed, 2019). According to an American Society for Clinical Pathology (ASCP) (2017) national laboratory wage survey, 39.4% of laboratory respondents felt underpaid and underappreciated (Garcia, Kundu, & Fong, 2019). Autonomy and feedback enhance job satisfaction, however the lack of wage equivalence and administrative support causes dissatisfaction (Han, Carter, & Champion, 2018). According to the Coordinating Council on Clinical Laboratory Workforce (CCCLW) (2018), appreciation, professional visibility, and wage equivalency with similarly educated professions are essential for resolving the recruitment and retention issues in laboratories. Strong

laboratory leadership is necessary to highlight the laboratory as a core asset (Gross et al., 2019), to build relationship, and to communicate the laboratory's value to healthcare administrators (Gross et al., 2019; Wagar et al., 2019).

The Laboratory Leader

Passiment and Linscott (2014) stated "The mystery of the laboratory is perpetuated by the lack of an organized, systematic, flexible, and bi-directional exchange of information, ideas, standards, and beliefs between the laboratory and its customers, i.e., effective communication." (p.451). Communicating PaLM's value requires laboratory leaders to present an effective message (Gross et al., 2019) that aligns recipient concerns and priorities (Gardner & Winder, 1998). Success stories need to be communicated and wins need to be publicized (Green et al., 2018). PaLM leaders, however, have failed to connect critical activities to the strategic imperatives of the broader organization (Dixon, 2019). Inadequate communication from proactive pathologists is a quality gap (Wagar et al., 2013). Among managers of service-oriented organizations, ineffective communication is the most frequently reported deficiency (Kerns, 2016). Pathologists interested in closing this quality gap must take interest in and learn business management and clinical operations (Wagar et al., 2013). Effective communication begins with a desire to communicate (Guo, 2011) and the skills for effective communication can be learned (Otto, 2017). A technical and clinical background is no longer sufficient for laboratory leadership. PaLM activities increasingly require a commitment toward managing administrative, organizational, and economic concerns (Lippi & Plebani, 2017), as well as managing human resources and informatics (Wilson, 2014).

PaLM Stakeholders

A key aspect in any value-proposition is considering the stakeholder's needs and expectations (Price et al., 2016). Fundamentally, organizations exist to create value for stakeholders (Austin et al., 2016). The activities that create value for stakeholders increase the ratio of satisfaction to price, improving quality, effectiveness, and efficiency (Swayne et al., 2006). Cost improvement strategies need buy-in and awareness from stakeholders (Henderson-Carter, 2014), without which the likelihood of maximum performance diminishes greatly (Longenecker & Longenecker, 2014). A VBHC culture requires an alignment of stakeholders with newfound partnerships, the creation of new roles, technology investments, and patient inclusion (Glanzman, 2017). Value creation requires an assessment of the customer's wants and needs (Karuppan et al., 2016). High-performing organizations create the structures that enable stakeholder engagement in priority setting and resource allocation decisions, although the executive team holds the final responsibility (Carman et al., 2014; Smith et al., 2016).

A value-creating ecosystem depends on the coordination of internal and external stakeholders as a network of governance (Pfannstiel & Rasche, 2017). External stakeholder communication, described as boundary spanning, provides an opportunity for organizational learning (Guo, 2011). At this point, most agree that healthcare costs are too high and support a common goal of improving outcomes more efficiently (Lee, 2010). However, there is a disagreement in who is responsible, and what is of value (University of Utah, 2017). The best value is a shared benefit for all stakeholders (Pennestri & Banfi, 2019), although in healthcare the stakeholder list can be quite extensive (Austin et al., 2016) with conflicting goals (Porter, 2010).

PaLM accrediting agencies recognize the importance of understanding stakeholder needs, expectations, and satisfaction (McCall, Souers, Blond, & Massie, 2016; Koh et al., 2014). The CCCLW taskforce identifies the laboratory's stakeholders as clinicians and patients, the organization, and the national, global, and public healthcare systems (Davis et al., 2018). A 2009 laboratory industry report on value identifies laboratory's stakeholders as regulators and government policymakers, clinicians, patients, hospital administrators, payers, and manufacturers (Wolcott et al., 2009). Epner et al. (2017) described laboratory stakeholders as the patient, care team, health system, community, and laboratory professionals. Price and St. John (2014) described the laboratory stakeholders as the government with a need to reduce costs and improve outcomes; the care provider with a need to meet regulated mandates, improve operations, and manage disease; and the patient with a need for accessible, affordable, and accurate test results. Hospital based laboratorians seeking support for new initiatives identified key stakeholders as the nurses, pharmacists, infection control practitioners, and the finance and information systems departments (Marlow, Novak-Weekly, & Larocco, 2016). Peters (2019) added that laboratory vendors as the key stakeholders.

Key stakeholders identified for hospital based laboratories are listed in Figure 4. It is beyond the scope of this study to explore the communications with PaLM stakeholders other than the hospital administrator. Passiment & Linscott (2014) recommend that all avenues of communication by PaLM leaders need further exploration to enhance services.

Figure 4.

Stakeholders in PaLM's Value Creating Ecosystem
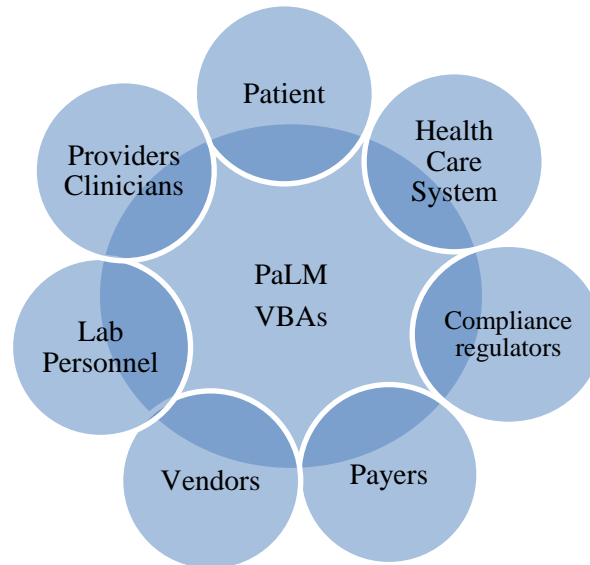
Value to Providers and Patients.

The purchasers of laboratory services, i.e., the government and health insurers, are

responsible for obtaining the best quality services (Price et al., 2016). The ordering provider is

responsible for interpreting and acting upon the lab test results (Schmidt et al., 2016). PaLM

accreditation standards require measurement of physician and patient satisfaction with laboratory

services every two years (CAP, 2014; Hawkins, 2012). Providers are generally satisfied with the

quality and reliability of laboratory testing, the courtesy of the laboratory staff, test menu

adequacy, and indicate a willingness to recommend their laboratory to other physicians (Jones et

al., 2009; McCall, 2016). Published surveys reveal that physicians value being able to provide

precise medical care in a short period of time (Abdallah, 2014) and desire accurate and timely

test results (Inal et al., 2016), especially for stats and esoteric send out tests (Jones et al., 2009;

McCall et al., 2016). Physicians are satisfied with surgical pathology reports (Nakhleh, Souers,

& Ruby, 2008), but would like patient reports to have more information where a risk for

potential false positives or false negatives exist (Kelman et al., 2016).

Patients seek readability, relevance, and next steps from their laboratory and pathology

results report (Kelman et al., 2016; Poczter & Giugliano, 2014). Patients feel empowered with

face-to-face pathology consults for a better understanding of their disease (Booth et al., 2018).

Patients desire convenient service locations with limited wait times (Karuppan et al., 2016).

Some surveys reveal a dissatisfaction with laboratory services relative to specimen collections,

delivery processes, phlebotomy (Koh et al., 2014), and the ease of order entry (McCall et al.,

2016). Physicians and patients express a desire for patient-friendly laboratory reports (Kelman et

al., 2016; Poczter & Giugliano, 2014) and easily retrievable test results (Passiment & Linscott,

2014).

Communicating with Stakeholders.

Communicating value involves understanding how stakeholders perceive value, and

articulating the benefits of services (Raman, 2014). Communication of value to stakeholders

remains a significant challenge in healthcare (Thaker et al., 2016). Understanding key

stakeholder needs and establishing feedback communication channels for feedback is essential to

managing change (Ryan, 2018). Promoting communication and partnerships among stakeholders

is necessary to facilitate engagement and anticipate the impacts of change (Carman et al., 2014).

Managers are responsible for ensuring bi-directional communication with stakeholders

(Passiment & Linscott, 2014). Establishing relationships with stakeholders builds rapport and

improves credibility (Communication, 2016). Articulating the benefits of a service allows

stakeholders to know its value (Raman, 2014) and establishes the identity of the laboratory

profession (Passiment & Linscott, 2014). Clinicians need communication and education from laboratorians to understand the basis for improvement initiatives (Process Improvement, 2017).

Effective Organizational Communication

Effective communication has not occurred until the receiver understands the information (Guo, 2011). Preconceived notions, perceptions, and interests influence messaging effectiveness (Karuppan et al., 2016). Best practices for effective communication channels include openness, a defined channel for all members, short and direct communication lines, and recurrent messaging (Gardner & Winder, 1998). Intra-organizational communication may be formal or informal (Gardner & Winder, 1998), and flow upward, downward, diagonally, or horizontally (Guo, 2011). Managers should communicate to executives interested in their efforts (Karuppan et al., 2016). The importance of internal communication is often overlooked (Kridelbaugh, 2018), despite that effective communication skills by leadership are associated with improved organizational outcomes (Otto, 2017). Senior leaders consistently underestimate the need for communication (Austin et al., 2016).

Strong systems for communication in healthcare improve patient safety (IOM, 2015). High-impact communications influence policy formulation and outcomes (Kerns, 2016). Communication is necessary to improve safety, reduce errors, educate, and disseminate information (Weld et al., 2015). In healthcare, effective communication with education improves error rates and patient safety (Weld et al., 2015). Additionally, employees report an increase in job satisfaction with effective upward communications (Gardner & Winder, 1998).

Communicating Top Down with Feedback.

Top-down communication must be frequent, understandable, and use multiple channels for effectiveness (Salahshor, 2016). Top-down one-way communication is quick and easy, but

disadvantageous for creating an understanding of change initiatives, importance, or functional

roles (Longenecker & Longenecker, 2014). Feedback allows for clarification of assumptions

(Adelman & Stokes, 2012). Feedback, defined as the reaction to the message, permits

clarification from the sender (Guo, 2011). Without feedback, tone-way communication from a

sender is less accurate, and the sender cannot know the message was accepted and accurately

understood (Gardner & Winder, 1998). A lack of two-way communication causes significant

problems in change or improvement initiatives (Longenecker & Longenecker, 2014). Superior

outcomes require two-way, ongoing communication between the leader and those making the

change happen (Longenecker & Longenecker, 2014).

Communicating Upward.

Upward-communication directs messaging toward higher authority, while horizontal (or

lateral) communication transfers information between different departments and supports task

coordination (Gardner & Winder, 1998). Upward communication, typically the most lacking

communication in organizations (Communication, 2016). Upward communication helps

employees contribute to organizational learning and helps administrators gauge the effectiveness

of downward communication (Bennett, 1968). Politics, a reward system, and coercive powers

negatively affect upward communication (Kumar & Mishra, 2017). Suppression of upward

communication occurs relative to negative information (Adelman & Stokes, 2012), especially

regarding failures or finances (Tourish & Robson, 2004). A culture of blame or a lack of

responsiveness inhibits upward communication (Ahmed, 2019). A lack of experience at a

specific business level or a lower education level hinders upward communication (Adelman &

Stokes, 2012; Bennett, 1968). Upward communication may lose impetus without effective action

or if blame is a concern (Gardner & Winder, 1998). It is important to emphasize collaborative

efforts and avoid placing blame for failed efforts (Henricks et al., 2015). Employees tend to filter

upward communication to present a positive image or to impress superiors, resulting in an

inaccurate presentation of issues (Ahmed, 2019; Tourish & Robson, 2004).

Effective upward communication requires that the administrator listen (Bennett, 1968).

Meaningful C-suite communication requires an understanding of how the organization makes

money and how it completes the mission (Agovino, 2019). The executive prefers concise,

relevant information (Communication, 2016) and remains skeptical of bold savings solutions

without details on the time, costs, and the necessary efforts (Øvretveit, 2009). When

communicating with a hospital administrator, the sender should write down the objective of the

message with points of clarity before presentation and avoid medical jargon depending on the

administrator's clinical background (Dhand, 2019). Communication with e-mail, while flexible

and offering time and cost savings, is limited and problematic (Guo, 2011). Information overload

for the executive can present a barrier to effective listening (Communication, 2016).

Communication from Laboratory Leaders.

A concerted effort by laboratory leadership is required to keep senior management

informed of recent developments and accomplishments (Kridelbaugh, 2018). Upward

communication provides status updates concerning department projects, performance results, and

improvement suggestions (Alder et al., 2019). Upward communication allows an opportunity to

coordinate efforts, process information, and reduce ambiguity (Johnson, 1993). Input from below

increases and broadens the information available for leaders to make decisions (Ashford et al.,

2009). Decisions made without lower rank involvement disrupts internal social processes and

creative behaviors (Kauppila et al., 2017).

Laboratory managers should establish favorable and constructive interfaces with hospital administrators (Lippi & Mattiuzzi, 2019). It is the responsibility of laboratory management to provide education and training to laboratory personnel that improves knowledge and verbal communication skills (Passiment & Linscott, 2014). Laboratory managers should encourage laboratorians to share expertise by serving on hospital committees or taking assignments with hospital nursing units as a recognizable liaison (Passiment & Linscott, 2014). Laboratorians that provide knowledge-based services to clinicians improve the laboratory's competitive value (COLA, 2015) and act as knowledge brokers transferring industry knowledge between and across systems (Puddy & Hall, 2017). Dialog between laboratory professionals, clinicians, and patients and their families educates all parties and helps to achieve the goal of right patient, right test, at the right time (Baird et al., 2018).

It is up to leadership to define and communicate the purpose of the organization, and to establish the necessary work practice teams to create value (IOM, 2001). Wagar et al. (2019) discussed the importance of the hospital pathologist, as a laboratory leader, having excellent communication skills and interfacing outside the laboratory. The pathologist ideally plays a major proactive role in performance improvements and the development of the laboratory's value proposition (Wood, 2016).

Communicating Value and Cost Savings with Metrics.

The ability to perform well in a value-based care environment relies on internal organizational processes more than structural features (Miller, 2019). Transparent and frequent communication is central to success when restructuring internal processes (Miller, 2019). Process improvement efforts fail without monitoring progress or communicating with executive sponsors (Karuppan et al., 2016). Performance metrics alone, however, do not necessarily

improve cost or quality "to any meaningful degree" (Miller, 2019, p. 445). Kaplan and Porter

(2011) argued that measuring the wrong things the wrong way is a big problem in healthcare.

The more appropriate measurable indicators are organizational learning and value gains (Nordin,

Kork, & Koskela, 2017).

The development of methods to quantify and communicate value in the medical

laboratory is critically important (Davis et al., 2018). VBHC necessitates chief financial officers

think in terms of value ROI, rather than financial ROI (Green et al., 2018). Thaker et al. (2016)

discuss the use of radar charts to visualize and communicate outcomes and the cost of care.

When exercising strategic measures, administrators may benefit from ROI information

determining intrinsic value and associated costs (Henderson-Carter, 2014). Spreadsheets

communicate the clinical and economic benefits of new technology by combining a variety of

data sources (BaseCase, 2012). The SBAR (Situation, Background, Assessment, and

Recommendation) is a structured communication tool used in healthcare (Marder, 2018).

Communicating cost savings may require that laboratorians isolate costs with time-driven

activity-based costing (TDABC) (Kaplan et al., 2014) or utilize a group purchasing organization

(GPO) to help determine actual supply costs (Maul et al., 2019). Laboratory vendors also aid in

developing reports for new technology implementations that demonstrate improved diagnostic

accuracy and timeliness of reporting (Epner et al., 2017). Laboratory professionals need further

development of programs to document and publish the impacts of new technologies and related

clinical, operational, or economic outcomes (Delvin, 2017; Puddy & Hall, 2017). Laboratory

data on solutions offer evidence that communicate the impacts of new methodologies, instrument

comparisons, and clinical practice changes (Landin, 2013). Managers gain political support

demonstrating with certainty the effectiveness of improvement activities and cost savings

(Øvretveit, 2009). Well-performed public presentations tailored toward the executive level establish credibility (Weinholdt, 2006). Success reports provide a useful communication tool (Hartland, 2018) and regularly prepared promotional materials offer the laboratory marketing collateral (Kridelbaugh, 2018).

Communicating Outcomes with Metric.

Choosing a value-based management strategy triggers process improvements and the measurement of outcomes (Nilsson et al., 2017). A lack of quantification or verbalization of outcomes means some projects may go unnoticed (Passiment & Linscott, 2014). VBHC contributes the structure for the identification and measurement of improvement needs (Kaplan et al., 2014), albeit there is no single set of core metrics universally accepted for the optimal measurement of value (Carmichael, Jassar, & Nguyen, 2016). While healthcare resources and attention are focused on compliance with evidence-based guidelines, ambiguity still exists in new reportable measures for value-based outcomes (Porter, Larsson, & Lee, 2016). Healthcare's value paradigm prompts the need for evidence in operational improvements (Gray, 2012) within the six strategic outcomes - "clinical, financial, process improvement, employee satisfaction, patient satisfaction, and learning and growth" (Tierney, 2017, p. 223). The monitoring of these outcomes enhances patient safety and prevents the underuse, overuse, or misuse of health services (Katz & Baum, 2018).

The importance and urgency of communicating value-based metrics is growing (Tierney, 2017), although many organizations simply do not know where opportunities exist for value improvement (Porter & Lee, 2016). Laboratorians communicate well with metrics for quality improvement projects (Bergeron, 2017; Bixho & Melanson, 2017). The Joint Commission accreditation standards require monitoring of performance metrics for efficiency, timeliness,

effectiveness, continuity, and safety (Bergeron, 2017). Medicare's Total Performance Score

measures lie in four domains: clinical care, engagement, safety, and efficiency and cost reduction

(Centers, 2019a), with two scores in each domain, "one for achievement, and one for

improvement" (QualityNet, 2019, par. 2).

Communicating Performance Outcomes.

There are many motives for measuring activities (see Figure 3). Ideally, the metrics for

diagnostic services demonstrate value as the health outcome achieved relative to cost for an

entire episode of care (European, 2017; Sarwar et al., 2015). Few organizations accurately

measure the costs of care or relate quality to cost (Lee et al., 2016). Some hospital administrators

measure ancillary performances based solely on test volumes and cost-to-charge ratios

(Bergeron, 2017). This method leaves unreimbursed value contributions unaccounted for in the

assessment for resource allocations and staffing decisions (Wilson, 2014). Providing actionable

intelligence useful for reengineering processes offers the best opportunity to lower healthcare

costs without sacrificing quality, safety, or outcomes (Kaplan et al., 2014). Assessments of

internal performance are necessary to identify the needed corrective adjustments (Gambel et al.,

2019) and to develop a corresponding measure (Epner, 2016).

Best practices involve establishing baseline metrics prior to interventions and

continuously reporting of project outcomes to leadership (Brown & Falk, 2013). Best practice

activity measures are those proven to communicate consistency in improving quality,

performance, turnaround time, safety, or another positive operating outcome, or lowering costs

(Gambel et al., 2019). Certain pharmacy activities were found to aid in the achievement of a

hospital's performance metrics (Carmichael et al., 2016) and several papers explore radiology's

value (ESR, 2017). Hallworth et al. (2015) discuss that PaLM value demonstrations need further development for benchmarking improvements and measures of effectiveness.

A performance measure provides a numeric description for analytical performance, turnaround time, availability, support services, or costs (Schmidt & Ashwood, 2015). Performance measures across the organization are useful in coordinating and integrating the activities, services, or functions across operational units (Bergeron, 2017). Balanced measures ensure that improvements in an area of the organization do not negatively influence other areas (Burton, 2016). A benchmark assessment is a numeric description used to evaluate or compare a business goal, target, trend, or performance (Poister, 2003).

Figure 5.

VBHC – Communicating Activities with Metrics

Leadership utilizes metrics to assess, monitor, and respond (Sarwar et al., 2015) (see Figure 5). Dashboard metrics communicate performance using key performance indicators (KPIs) (Azadmanjir et al., 2015). KPIs measure the effectiveness of unit resources, quantifying performance and outcomes (Bergeron, 2017). Department administrators utilize KPIs to monitor utilization and compliance (Bergeron, 2017). KPIs may relate to finance, productivity, regulatory compliance, or processes such as turnaround time, down times, wait times, or staffing efficiency

(Sarwar et al., 2015). Individuals and teams need ongoing performance measures for feedback of the progress made toward the desired outcomes (Longenecker & Longenecker, 2014). Metrics allow leadership to determine the degree of adherence to the organization's mission (Sarwar et al., 2015). Ensuring standardization in processes requires measurement to enforce compliance (Batalden & Davidoff, 2007). Process standardizations lead to quality improvements (Green et al., 2018). Benchmarking the processes compares and evaluates the goals, targets, trends, or performances from one organization against another (Poister, 2003). Benchmarking of service quality and customer value depends on the customer's perspective (Fottler et al., 2002).

Many performance metrics are visible when rolled up into scorecards or dashboards (Green et al., 2018). The laboratory's silo-business-management model is evident in that laboratory performance metrics match like-kind disciplines, rather than capture process improvements (Plebani, 2016; Price et al., 2016). PaLM leaders, collaborating with enterprise warehouse analysts, utilize dashboards to monitor, educate, and communicate improvements (Baird et al., 2018; Ducatman et al., 2018). Laboratory dashboard analytics identify the opportunities for team collaboration (Gupta et al., 2019).

Communication of Knowledge.

Achieving the goal of a good communication system requires laboratory leaders to be involved outside of the laboratory (Passiment & Linscott, 2014). Value creation in healthcare does not occur within specialty silos, but rather in working with teams across the care cycle (Porter & Lee, 2016). Laboratory leaders demonstrate value when interfacing with other healthcare professionals (Wagar et al., 2019) and communicating cross-functionally in hospital meetings (Adelman, 2012). The ability to work collaboratively and effectively across organizational boundaries enhances influence and builds strong allies with institutional leaders

(Henricks et al., 2015). Organizational knowledge improves with shared experiences among and between employees (Nilsson et al., 2018). Interdepartmental communication and collaboration may be the best way to promote organizational learning (Nilsson et al., 2018). Interdisciplinary participation improves diagnostic errors (IOM, 2015), as well as inefficiencies and ineffective processes (Bodenheimer & Smith, 2013; Laposata, 2018b; Raebel et al., 2019). High-performing healthcare organizations promote multidisciplinary decision-making (Smith et al., 2016). Team activities provide opportunities to connect with others, thereby promoting learning, knowledge dissemination, skills enhancement, and employee satisfaction (Carman et al., 2014; Nilsson et al., 2018). Networking in healthcare aids the exchange of best practices and protocols (Spaulding et al., 2018). Distribution of knowledge with integration from differing perspectives refines, updates, and transforms the organization (McFadden et al., 2014). Enhancement of internal skills and capabilities improves an organization's competitive advantage (Gambel et al., 2019). Laboratory leaders ensure skills development when supporting continuous education, networking with local and national healthcare professional groups (Dickerson et al., 2017), and requiring adequately credentialed staff (Delost et al., 2009; Lorenz et al., 2018).

Healthcare's functional structures foster silos, slowing down decision-making and inhibiting communication (Swayne et al., 2006). Effective communication efforts minimize knowledge silos that can undermine an organization's potential (Guo, 2011). Quality improvement researchers highlight the need to recognize the nested nature of healthcare, and to understand the nature of relationships (Carman et al., 2014). Successful improvement initiatives require planning and spreading knowledge throughout the organization, outside the silo of leadership (Graber, 2017). Siloed planning processes result from poor communication, while a shared vision creates a strong alignment and common purpose (Austin et al., 2016). The lack of

collaboration across teams undermines organizational learning and reinforces silence (Adelman & Stokes, 2012; Nilsson et al., 2018). Silos cause communication and knowledge gaps, requiring better processes and more technology to overcome (Lord, n.d.).

Value creation in healthcare does not occur in specialty silos, but rather in working teams across the care cycle (Porter & Lee, 2016). Hospital units could benefit from the knowledge of other units (like the laboratory) with more awareness of other's activities (IOM, 2013). Communicating improvement activities demonstrates the efforts to transform operations (Fusch & Gillespie, 2012).

Communication of Value with Scholarly Evidence.

Evidence-based research is an important, yet an underappreciated aspect of PaLM value (Price & St. John, 2014; Schmidt & Ashwood, 2015). Laboratory authors contribute scholarly evidence, e.g., personalized healthcare, cost effectiveness (Leibach, 2014), utilization and operational improvements (Delvin, 2017; Hauser & Shirts, 2014), new technology implementations (Delvin, 2017; Tan et al., 2017), and patient case studies (Nadder et al., 2018). Evidence-based research curriculums are incorporated into CLS undergraduate programs (Landin, 2013). Incidentally, only 20% of the published laboratory utilization studies are authored by pathologists (Hauser & Shirts, 2014). MLS typically engage in scholarly activities relative to performance improvement, rather than clinical research (Laudicinia et al., 2011). Surveys in 2011 showed that 32% MLS performed applied, clinical, or educational research, although only 18% of surveyed participants were required to do so as a condition of employment (Laudicinia et al., 2011). Pathologists and laboratory scientists publish articles in journals such as the *Archives of Pathology and Laboratory Medicine* (2019), the *American Society for Clinical Laboratory Science* (2017), the *American Journal of Clinical Pathology* (2018), the *Clinical*

Leadership & Management Review (n.d.), the *American Society for Microbiology Journals* (2019), and the *Journal of Applied Laboratory Medicine* (2019). According to a 2010-2014 citation analysis the *Clinical Laboratory Science* journal is the most frequently cited (Delwiche, 2016). Schreiber & Giustini (2019) recommend that pathologists and MLS familiarize themselves with the *h-index* used by university researchers as an evaluation of authorship for professional advancement.

Communication Barriers.

Communication in healthcare is a challenge, requiring ongoing attention, with new and varied approaches (Adelman, 2012). Effective communicators must overcome barriers "to engage in more meaningful and successful communication" (Guo, 2011, p. 72). Effective communication does not happen automatically (Gardner & Winder, 1998). Communication effectiveness depends on the format (Guo, 2011), delivery (Gardner & Winder, 1998), and organizational structure (Passiment & Linscott, 2014; Adelman, 2012).

The alternative interests of administrators may act as a barrier to receiving upward communication messages (Guo, 2011). Information overload (Communication, 2016; Gardner & Winder, 1998) and a lack of interest or focus (Guo, 2011; Karuppan et al., 2016) hinder effective listening. Information overload results in selective screening and discarding of information (Gardner & Winder, 1998). Details are better remembered when the receiver is interested in the topic (Karuppan et al., 2016).

Organizational charts define the intended communication channels (Passiment & Linscott, 2014), although hierarchy inherently filters information (Adelman, 2012; Tourish & Robson, 2004). Power or status can affect the transmission of a message (Guo, 2011). PaLM's hierarchical and sub-disciplines may not always be conducive to information flow (Passiment &

Linscott, 2014). For the scientific personality type, communication does not come easily, nor is

communication routinely addressed in academic science curricula (Passiment & Linscott, 2014).

Communication difficulties within organizational hierarchies require an understanding manager

with excellent people skills.

Successful improvement initiatives require a communication plan for spreading

knowledge throughout the organization (Graber, 2017). Change inevitably results in at least

some level of cognitive dissonance, thus communication should be proactive and intentional to

mitigate resistance (Ryan, 2018). Organizational change requires enough communication with

strong advocacy to overcome internal inertia; yet, too frequent or too strong of communication

has negative effects (Bel, Smirnov, & Wait, 2018).

Themes and Perceptions Tables

Table 1.

PaLM's Value Chain

PaLM topics	Discussion points
PaLM roles & knowledge sharing	Roles for laboratorians are changing (Laposata, 2018; Lippi & Mattiuzzi, 2019; Nadder, 2013; Rutgers, 2017; Wilson, 2015). PaLM leaders have failed to connect PaLM VBAs with the broader value-based strategy (Dixon, 2019). Good hospital communication systems require involvement of laboratorians outside the laboratory (Passiment & Linscott, 2014) with multidisciplinary teams (IOM, 2015; Wagar et al., 2019), serving on committees (Wilson, 2014), offering consultation (Davis et al., 2018; Fydryszewski, 2019; Laposata, 2018), and interacting with physicians and nurses (Unsworth & Lock, 2013; Wagar et al., 2019). Existing reimbursement structures disincentivize hospital-based pathologists from participating outside the laboratory (Hendricks et al., 2015; Laposata, 2018). Collaboration across boundaries enhances influence (Henricks et al., 2015) and organizational knowledge (McFadden, 2014; Nilsson et al., 2018). Laboratory professionals networking exchanges best practices (Dickerson et al., 2017; Spaulding et al., 2018). Credentialing ensures skills enhancement (Delost et al., 2009)

PaLM competitive value & customer service	Improving core competencies enhances value (Fottler et al., 2002; Gambel et al., 2019; Kratz & Laposata, 2002). Continuing education, networking, and requiring credentialed staff improve skills (Delost et al., 2009; Dickerson et al., 2017). Laboratory professionals offer clinical consultation (COLA, 2015), providing expertise on care teams, tumor boards, and infection prevention committees (Davis et al., 2018). Laboratory expertise improves test utilization, antibiotic stewardship, and transfusion management (Davis et al., 2018; Morgan et al., 2017; CCCLW, 2016) and reduces diagnostic error, and avoids unnecessary testing (ASCLS, 2018), improves patient outcomes, reduce infections, increase patient throughput (Gupta et al., 2019). Laboratorians communicate results, clarify interpretations, and liaise with clinicians (Unsworth & Lock, 2013; Wagar et al., 2019). Laboratorians, as knowledge brokers, disseminate information (Price & St. John, 2014) from research into practice (Birken et al., 2018; Thompson & Barcott, 2019), improving skills and methods (Lewandrowski et al., 2018; Grove et al., 2019), transferring knowledge between and across the system (Puddy & Hall, 2017). Dialog with laboratory professionals educates all parties (Baird et al., 2018) and improves the organization's competitive value (COLA, 2015). Laboratorians providing knowledge-based services improve competitive value (COLA, 2015), educate clinicians (Process Improvement, 2017), and enforce compliance. Inter-disciplinary activities allow for knowledge sharing, and improve skills and capabilities (Kim et al., 2012; Nilsson et al., 2018). Team efforts, research projects, consultations add value (COLA, 2015; Davis et al., 2018; Fydryszewski, 2019; Wagar et al., 2019), which improve organizational performance (CCCLW, 2016; Davis et al., 2018; Morgan et al., 2017). Lab leaders improve test selection, utilization, interpretation, diagnostic and errors (ASCLS, 2018)
PaLM utilization, efficiency, & effectiveness	Interdisciplinary participation improves diagnostic errors, inefficiencies, and ineffectiveness (Bodenheimer & Smith, 2013; IOM, 2015; Raebel et al., 2019). Government payor arbitrary cuts on lab services lack consideration of medical necessity, harming patient outcomes (Wilson, 2015; Halstead et al., 2018; Porter et al., 2017). Demand management and utilization strategies more effectively reduce costs (Lewandrowski et al., 2017; Wilson, 2015). Reengineering processes lowers costs without sacrificing quality, safety or outcomes (Kaplan et al., 2014). Productivity improves by eliminating duplication of services and delays (Inal et al., 2018; Krintus et al., 2017). Efficient organizations focus on operations (Schwartz & Pearson, 2013), improve processes, complications, time (Davis et al., 2018; Inal et al., 2018; Schmidt et al., 2016; Worster et al., 2017;), and develop continuous improvement cultures (Hallworth et al., 2015). Effective organizations adopt best practices (Srivastava & Sushil, 2018) and a culture of learning (Swayne et al., 2006) to optimize outcomes

	(Glanzman,2017; Hallworth et al., 2015).
PaLM cost savings	Cost effectiveness improves with operational efficiency and competent management (COLA, 2015). Laboratory cost savings may occur as cost effectiveness, cost containment (COLA, 2015), or operational efficiency (COLA, 2015; Hallworth et al., 2015; Schmidt et al., 2016). PaLM reduces costs by implementing utilization strategies (Lewandrowski et al., 2017), pricing and reimbursement assessments, stewardship programs, and consultations (Birken et al., 2018; COLA, 2015; Halstead et al., 2018). Other strategies for lowing costs include mergers (Knowles & Barnes, 2013), integrations, improvements in operational efficiencies (COLA, 2015), processes, productivity, utilization (Niemeijer et al., 2011), and quality (Kim et al., 2012) and contractual relationships (Harrison et al., 2017; Schwartz& Pearson, 2013). Competent PaLM managers reduce costs with market assessments (Bergeron, 2017; Downs & McMinn, 2017), and analysis of acquisition costs (Bergeron, 2017), and ROI. PaLM leaders improve the total cost of care (Passiment & Linscott, 2014).
PaLM testing quality & data	Standardizations improve quality (Green et al., 2018). Laboratory's people assets contribute high-quality necessary for the diagnosis, prognosis, treatment, and management of human disease (Anonychuk et al., 2012; Davis et al., 2018). The analytical dimension of laboratories is the best performing sector of healthcare (Hawkins, 2012). Laboratory test results offer value (Collinson, 2017; Nam, 2015; Price & St. John, 2014; Schmidt et al., 2016). Value is found in the testing quality performance (Hawkins, 2012; IOM, 2015; Plebani & EFLM, 2017; Schmidt & Ashwood, 2015), and the cumulative testing data (Kroft et al., 2018; Wagar et al., 2019) to benefit the healthcare system (Gross et al., 2019; Nadder et al., 2018; Swanson et al., 2018). PaLM data educates providers (Wagar et al., 2019), generates the data for clinical knowledge (Xu et al., 2015) necessary to improve patient care efficiency and outcomes (Shirts et al., 2015) and to identify at risk populations and comorbidities (Gross et al., 2019).

Table 2.

PaLM Leaders and Stakeholders

PaLM topics	Discussion points

Shared value	A value proposition considers stakeholder's needs and expectations (Austin et al., 2016; Karuppan et al., 2016; Price et al., 2016). Cost improvement strategies need stakeholder buy-in (Henderson-Carter, 2014) to maximum performance (Longenecker & Longenecker, 2014). VBHC requires stake-holder engagement (Carman et al., 2014; Smith et al., 2016), stakeholder alignment, development new roles and technology, and patient inclusion (Glanzman, 2017). The organizational ecosystem consists of the internal staff, interfaces, and external stakeholders as a network of governance (Pfannstiel & Rasche, 2017; Swayne et al., 2006). All healthcare stakeholders agree that costs are high, and outcomes need improved, but *what* is valued and *who* is responsible remains debatable (University of Utah, 2017). The best value is a shared benefit (Austin et al., 2016; Pennestri & Banfi, 2019; Porter 2010).
PaLM stakeholders	PaLM stakeholders include administrators, patients, the government and other insurance payers, suppliers, test manufacturers (Price et al., 2016; Wolcott et al., 2009), and ordering providers (Schmidt et al., 2016). PaLM leaders assess provider and patient satisfaction (CAP, 2014; Hawkins, 2012). Providers act on test results (Schmidt et al., 2016), value timely and precise results (Abdallah, 2014; Inal et al., 2018; Jones, 2009; McCall et al., 2016) and are satisfied with PaLM quality, reliability, courtesy, test menu adequacy, and results reporting (Jones et al., 2009; McCall, 2016; Nakhleh et al., 2008). Clinicians desire improvements in specimen collection and delivery processes (Koh et al., 2014), and ease of use in computer order entry (McCall et al., 2016). Patients desire more information for ambiguous results with next steps instructions (Kelman et al., 2016; Poczter & Giugliano, 2014), and feel empowered with face-to-face consultations (Booth et al., 2018). Patients desire convenient locations and limited wait times (Karuppan et al., 2016).
Hospital administrator's concerns	Administrators are still discovering responses for VBHC initiatives (DeMarco et al., 2016; Spaulding et al., 2018). Hospital administrators focus on many things including quality, safety, efficiency, personnel, cost reductions (ACHE, 2019; Green et al., 2018; Newman, 2018), government mandates, accreditation, financial incentives, and measurable factors (Tierney, 2017; Tinker, 2018). Top improvement areas include clinical, financial, processes, patient and employee satisfaction, and learning and growth (ACHE, 2019; Tierney, 2017). CEOs acknowledge that improvement initiatives help achieve lower cost and better outcomes (Cosgrove et al., 2012). Administrators set goals and objectives, allocate resources, and evaluate performance (Kaplan et al., 2014; Kim et al., 2012). Administrators are responsible for communicating change (Salahshor, 2016), especially when implementing cost control and resource allocations (Madden, 2015).

	Administrators use leadership skills to engage others (Salahshor, 2016) and manage change (Liang et al., 2013). Administrators seek value in laboratory's interactions with the rest of the health system (Schmidt et al., 2016) and need to ensure the necessary partnerships for the laboratory (Warren, 2013). Administrators seeking to improve quality and decrease costs ideally include pathologists (Misialek, 2014) and laboratory management.
Stakeholders undervalue PaLM services	Medical laboratorians are underappreciated (Jordan et al., 2015) and overlooked (Downs & McMinn, 2017; Shrinkman, 2016). Hospital administrators lack an understanding of PaLM VBAs (Branda et al., 2014; Lewandrowski, 2017; Protzman et al., 2015). The paucity of evidence demonstrating PaLM's impact on healthcare cost and outcomes contributes to the under-recognition of services (Anonychuk et al., 2012). The people assets of laboratories are often undervalued (Epner, 2017; Garcia et al., 2019; Tulsi, 2019), under-paid, and underappreciated (Garcia et al., 2019; CCCLW, 2018; ASCLS, 2018). Appreciation and wage equivalence is necessary to resolve recruitment and retention issues among laboratorians (CCCLW, 2018; ASCLS, 2018). Hospital leaders that fail to recognize PaLM's value (Gross et al., 2019) may consider outsourcing laboratory services (Crawford et al., 2017; Downs & McMinn, 2017; Futrell, 2013; Mrak et al., 2018) cutting personnel, or lowering required educational standards (Epner, 2017). Outsourcing tests could improve costs but risk many negative implications (Ferraro & Panteghini, 2017; Lippi & Mattiuzzi, 2019; Rogers et al., 2019; Terese, 2019; Weinert et al., 2015;). Competent lab management weighs sourcing decisions (Weinert et al., 2015).

Table 3.

Effective Communications, Challenges, and Barriers

PaLM topics	Discussion points
VBHC strategies	VBHC implementation requires internal alignment of the business units and effective communication (Fry & Baum, 2016; Wagar et al., 2019) with an intentional leadership agenda (Berwick & Hackbarth, 2012). VBHC strategies involve improving processes and outcomes, while reducing costs (DeMarco, 2016; Porter et al., 2017). Value increases with lower costs, improvements in quality and services, and surpassing rival capabilities (Gambel et al., 2019). VBHC strategies require commitment to reducing waste, improving outcomes, and saving costs (Berwick et al., 2008; IOM, 2013). VBHC requires research (Raman, 2014) and a communication plan (Fry & Baum, 2016). Strong communication systems improve safety (IOM, 2015). The changes

	involved with VBHC require strong advocacy with adequate, effective communication (Bel et al., 2018; Guo, 2011; Ryan, 2018), and an alignment of leadership at all levels (Austin et al., 2016; Fry & Baum, 2016). High-impact communications influence policy formulation and outcomes (Kerns, 2016). The challenges with VBHC implementations should not be underestimated (AHA, 2017; Chatfield et al., 2017; Delmatoff & Lazarus, 2017; Porter & Lee, 2016). The need to communicate is consistently underestimated (Austin et al., 2016; Kridelbaugh, 2018).
Effective communication and teamwork	Effective communication improves organizational outcomes (Otto, 2017). Transformation is a team effort (Chatfield et al., 2017). VBHC requires effective communication, clear objectives, strong stakeholder relationships, and performance improvement incentives (Lemire et al., 2013). Teams create value (Porter & Lee, 2016), although the nature of healthcare is nested (Carman et al., 2014). Multi-disciplinary activities increase awareness (IOM, 2013), draw upon organizational knowledge (Raebel et al., 2019), and promote learning and communication (Nilsson et al., 2018). Silo planning results in poor communication (Austin et al., 2016), while a shared vision strengthens alignment and purpose (Austin et al., 2016; Graber, 2017). Collaborative work crosses boundaries and builds allies (Hendricks et al., 2015). Team activities connect others promoting interdepartmental communication, collaboration, and organizational learning (Carman et al., 2014; Nilsson et al., 2017), social connection, knowledge and skills dissemination, and job satisfaction (Carman et al., 2014; Nilsson et al., 2018;) updating the organization (McFadden et al., 2014).
Integrated systems and communication	Communication networks, team efforts, and better staff satisfaction (Beckett & Kipnis, 2009) help integrated systems to score higher on VBHC performance metrics. Health systems demonstrate better organizational learning and efficiencies with change management. Networking exchanges best practices and protocols (Spaulding et al., 2018). High-performing organizations promote multidisciplinary decision-making (Smith et al., 2016).
Challenges to effective communication	Communication is a challenge (Adelman, 2012). Ineffective communication among service-oriented managers is frequent (Kerns, 2016). Inadequate communication from laboratory leaders is an identified quality gap (Wagar et al., 2013; Weiss et al., 2011), resulting in a failure to connect VBAs to strategic imperatives (Dixon, 2019). Decisions made without input from lower ranks disrupt the organization (Kauppila et al., 2017). Communication mitigates resistance (Ryan, 2018), overcomes inertia (Bel et al., 2018), and provides two-way clarification for change initiatives to avoid problems and produce superior outcomes (Gardner & Winder, 1998; Longenecker &

	Longenecker, 2014).
Communication barriers	Effective communication is not automatic (Gardner & Winder, 1998) or easy (Passiment & Linscott, 2014) and requires overcoming barriers (Guo, 2011). Communication effectiveness is influenced by the format (Guo, 2011), the delivery (Gardner & Winder, 1998), organizational structure (Adleman, 2012; Passiment & Linscott, 2014; Tourish & Robson, 2004), and hierarchy (Aldeman, 2012; Passiment & Linscott, 2014). Effective listening is hindered by alternative interests (Guo, 2011), current focus (Karuppan et al., 2016), and/or information overload (Gardner & Winder, 1998; Communication, 2016). Politics, reward systems, and coercive powers negatively affect communication (Kumar & Mishra, 2017). Negative information is suppressed (Tourish & Robson, 2004), especially in a culture of blame or a lack of responsiveness (Ahmed, 2019). Upward communication is hindered by lower-level education and/or experience (Adelman & Stokes, 2012; Bennett, 1968). Communication is slowed down and inhibited in silos (Swayne et al., 2006).

Table 4.

Communication and Healthcare Administrators

PaLM topics	Discussion points
Communication and the hospital administrator	Leaders define and communicate the purpose (IOM, 2001). Top-down communication must be frequent, understandable, and in multiple ways (Salahshor, 2016). Top-down communication is disadvantageous for communicating change, importance, functional roles, and efforts needed to achieve outcomes (Longenecker & Longenecker, 2014). The CEO plays a key role in fostering upward communication with genuineness, visibility, and approachability (Adelman, 2012; Ashford et al., 2009). Administrators must tap department knowledge to improve organizational deficiencies (Adelman & Stokes, 2012; Salahshor, 2016). Frontline intelligence improves hospital safety, engagement, and other areas of vulnerability (Wolpaw et al., 2018). Input from below increases and broadens the information available for decision-making (Ashford et al., 2009).
	Meaningful C-Suite communication requires understanding the mission and the money (Agovino, 2019). Executives focus on total performance scores in the clinical domains, safety, engagement, efficiency and cost reductions (Centers, 2019a). Healthcare administrators prefer concise, relevant information (Communication, 2016), with details of time, cost, and efforts (Øvretveit, 2009). Upward communication keeps the

	administrator informed of accomplishments (Kridelbaugh, 2018) department results, projects, and recommendations (Alder et al., 2019).
Communication and the laboratory leader	Some administrators measure ancillary services solely on test volume and cost (Bergeron, 2017) missing unreimbursed activities (Wilson, 2014). Laboratory leaders need a concerted effort to keep senior management informed of developments and accomplishments (Kridelbaugh, 2018). The responsibility to improve upward communication falls on managers (Alder et al., 2019) to establish favorable and constructive interfaces (Lippi & Mattiuzzi, 2019). Leaders ensure bidirectional stakeholder communication, oversee change and feed-back (Passiment & Linscott, 2014; Ryan, 2018), influence resistance (Protzman et al., 2015), and build rapport and credibility (Communication, 2016). Leaders define and communicate the purpose and establish the necessary teams to create value (IOM, 2001). Pathologists play a major role in performance improvement and development of the value proposition (Wood, 2016). The non-pathologist laboratorian plays a role promoting patient safety and quality of care (Kim et al., 2011). DCLSs and MLSs lead VBAs and communicate with clinical expertise (Laposata, 2018; Nadder et al., 2018; University of Texas, 2017; Rutgers, 2017; University of Kansas, 2018). Skills for communicating can be improved (Otto, 2017). Management is responsible for educating and training personnel, improve verbal skills and knowledge and encourage staff to participate outside the laboratory (Passiment & Linscott, 2014). Communications in all forms convey the laboratory's image, whose professional identity needs further exploration (Passiment & Linscott, 2014).
PaLM communications	Proactive communication is a quality gap (Dixon, 2019; Wagar et al., 2013), necessary for conflict resolution (D'Andreamatteo et al., 2015), change management (Graber, 2017), culture and climate shaping (Birken et al., 2018; Kim et al., 2011; Glavas & Goodwin, 2013), and organizational knowledge sharing (Nilsson et al., 2018; Birken et al., 2018). Leadership plays an essential role in communication and improvement activities (COLA, 2015; Kridelbaugh, 2018; McFadden et al., 2014; Otto, 2017) shaping behaviors (Boland et al., 2017; Glavas & Goodwin, 2013; Henderson-Carter, 2014). The pathologist needs communication skills to influence decisions and to interface outside the laboratory (Wagar et al., 2019) and to improve the laboratory's value proposition (Wood, 2016). Laboratory leaders interfacing with others demonstrate value when communicating cross-functionally (Adelman, 2012; Wagar et al., 2019). Laboratory managers need favorable and constructive interfaces with hospital administrators (Lippi & Mattiuzzi, 2019).
Benefits of	Upward communications provide status updates or improvement

communication	suggestions (Alder et al., 2019). Input from below increases and broadens information available to decision-makers (Ashford et al., 2009). Demonstrations of improvement activities and cost savings gain political support (Øvretveit, 2009). Well-performed presentations establish credibility (Weinholdt, 2006).

Table 5.

Communicating Value – Performance, Metrics, Costs

PaLM topics	Discussion points
Communicating performance improvements	VBHC triggers the need for improvements in processes and outcomes (Gray, 2012; Kaplan et al., 2014; Nilsson et al., 2017; Tierney, 2017). Communicating VBAs demonstrates transformational efforts (Fusch & Gillespie, 2012). Assessments fuel improvements (Gambel et al., 2019; Kaplan et al., 2014) and discover current state gaps (Gupta et al., 2019; Pynes & Lombardi, 2011). Benchmarking evaluates and compares (Poister, 2003) across industries (Gambel et al., 2019). Metrics assess, manage, and help the leadership respond (Sarwar et al., 2015), as well as gauge improvement outcomes (Burton, 2016). Baseline metrics show prior improvement states for monitoring continuous efforts (Brown & Falk, 2013). Performance measures provide a numeric description (Schmidt & Ashwood, 2015) for coordinating hospital units (Bergeron, 2017). Balanced measures monitor cross-unit influential changes (Burton, 2016). Success reports offer a communication tool (Hartland, 2018). Promotional materials offer marketing collateral (Kridelbaugh, 2018).
Communicating with metrics	Performance metrics roll up into dashboards or scorecards (Green et al., 2018) for communicating KPIs (Azadmanjir et al., 2015; Bergeron, 2017; Burton, 2016), monitoring compliance, utilization, service line integration, or operational functions (Bergeron, 2017). Laboratories tend to benchmark with like-kind disciplines rather than performance improvements (Plebani, 2016: Price et al., 2016). PaLM leaders collaborate on dashboard analytics (Baird et al., 2018; Ducatman et al., 2018).
VBHC metrics	Value based metrics in healthcare are expanding (Tierney, 2017). TPS measures four domains: clinical care, engagement, safety, and efficiency plus cost reduction (Centers, 2019a; Quality Net, 2019). The Joint Commission monitors metrics for efficiency, timeliness, effectiveness, continuity, and safety (Bergeron, 2017). Providers track processes, wait times, productivity, and financial measures (Larsson & Tollman, 2017). Best practice measures are those proven to

	communicate consistency in cost reductions, or improvements in quality, performance, TAT, safety, or another operating outcome (Gambel et al., 2019). Radar charts communicate outcomes with cost of care (Thaker et al., 2016). ROI communicates financial and value advantages (Green et al., 2018; Henderson-Carter, 2014). Spreadsheets communicate changes and benefits (BaseCase, 2012); SBAR communicates problems and solutions (Marder, 2018).
Demonstrating cost savings	GPO reports evaluate utilization and costs (Maul et al., 2019). Vendors assist laboratorians with operational research for implementations (Epner et al., 2017). Lab data provides evidence of new methods, instrument comparisons, and clinical practices changes that affect reimbursements and outcomes (Davis et al., 2018; Landin, 2013). More published research from PaLM is needed (Davis et al., 2018; Delvin, 2017; Epner et al., 2017; Landin, 2013). TDABC isolates true costs (Kaplan et al., 2014), demonstrating reliable cost-savings opportunities (Etges-Eng et al., 2020). TDABC is the gold standard in measuring healthcare's *true costs* (HBS, n.d.)

Summary of the Literature Review

VBHC strategies require identification of improvement opportunities in processes, outcomes, and costs (IOM, 2013; Porter et al., 2017). Implementation of an effective value-based strategy requires linking internal business unit activities to organizational objectives (Bryson, 2018; Gambel et al., 2019). PaLM leadership has failed to link value-based initiatives to the strategic imperatives of the broader organization (Dixon, 2019). Recognition of PaLM's value contributions is critical for achieving a successful evidence-based health policy (Misialek, 2014).

Clinical diagnostics is underappreciated (Beastall, 2013; Jordan et al., 2015) and overlooked by hospital administrators (Downs & McMinn, 2017; Shrinkman, 2016). Hospital administrators and non-pathology physicians remain unaware of the scope of activities and roles within laboratory medicine (Branda et al., 2014; Lippi & Plebani, 2017). Laboratory leaders need a communication strategy (Passiment & Linscott, 2014) that demonstrates the value associated with PaLM efforts to improve costs (Halstead et al., 2018; Price et al., 2016), efficiencies, and outcomes (Kaushik et al., 2018; Schmidt & Ashwood, 2015). An effective communication

strategy requires a credibly perceived information source, competent communicators, and a

clearly defined message (Gardner & Winder, 1998). Laboratory leaders need to encourage

communication on the efforts to improve processes and minimize costs (Sikaris, 2018).

Pathologists need to champion the communication of value to hospital administrators (Gross et

al., 2019).

The mastery and orchestration of value-chain activities, along with core capabilities and

availability of resources, strengthens a value-proposition (Pfannstiel & Rasche, 2017).

Assessment within the value-chain identifies the VBAs of individual healthcare units (Swayne et

al., 2014; Carman et al., 2014) and the services necessary to optimize the value delivery to the

patient (Tierney, 2017). Identification of VBAs provides the information needed to re-engineer

workflows and improve service delivery (Boland et al., 2017). An internal audit of a business

unit's capabilities and deficiencies provides an assessment for leveraging resource capabilities

and a clear understanding of strengths and weaknesses (Karuppan, Dunlap, & Waldrum, 2016).

Linking internal improvement initiatives to an organization's broader objectives provides

decision makers with an understanding of the value contributions and aligns the organization

(Bryson, 2018; Carman et al., 2014).

Summary of Section 1 and Transition

Effective messaging requires constructing information around the interests of the receiver

(Gardner & Winder, 1998). Effective communication with hospital administrators making

strategic decisions requires a communication plan (Graber, 2017). Effective messaging to the

laboratory's stakeholders is necessary for optimizing improvement initiatives (see Figure 4).

While process improvement activities can enhance communication efforts (Carman et al., 2014;

Fusch & Gillespie, 2012), siloed planning inhibits communication and slows down decision-

making (Swayne et al., 2006).

Understanding and communicating PaLM VBAs is vital, especially as hospital

reimbursements now require proof of improved performance (Centers, 2019a; QualityNet, 2019).

Effective demonstrations of value from PaLM leaders may justify the laboratory's share of a

value-based payment (Dixon, 2019). Communication of initiatives demonstrates transformational

efforts (Fusch & Gillespie, 2012), as well as the value associated with those making the

transformation happen, i.e., healthcare's people assets (Tulsi, 2019).

Section 2: The Project

The focus of this applied business study was the significant problem of the failure of

laboratory leadership to communicate PaLM VBAs to healthcare administrators, resulting in lost

opportunities to demonstrate cost savings. Hospital case selections were made based on care

type, service offerings, and CMS star ratings. Interviews were conducted with hospital-based

administrators and PaLM leaders knowledgeable of VBAs to gain a better understanding of the

demonstrations of improvement activities. Research questions were answered by collecting data

from audio recorded semi-structured interviews that were transcribed and coded (Stake, 2010). A

thematic analysis approach was utilized with the NVivo application to support the examination

of the interview data. The Robbins et al. (1994) model of communication provided guidance for

analyzing communication efforts, including the importance of feedback. The mVCM offered

insight into analyzing PaLM's value-chain activities.

Purpose Statement

The purpose of this qualitative case study is to add to the body of knowledge by

exploring laboratory leadership's communication of VBAs to hospital administrators. This larger

problem was explored through interviews with acute care hospital administrators and laboratory

leaders to discover if and how value-based initiatives are communicated. Laboratory leadership

may use this information to improve communication strategies for value-based initiatives.

Communicating value requires research and a well thought plan (Raman, 2014). A concerted

effort by laboratory leadership is required to keep senior management informed of recent

developments and accomplishments (Kridelbaugh, 2018), and to align initiatives with

organizational objectives and strategy (Karuppan et al., 2016; Passiment & Linscott, 2014).

Hospital administrators can use this information to gain further insight into the value

contributions of PaLM services and ensure implementation of cost savings measures. VBHC

strategies necessitate the identification of improvement opportunities (IOM, 2013).

Implementation success requires a clear communication plan and an alignment of leadership (Fry

& Baum, 2016). Successful strategies link internal business unit activities with broader

organizational objectives (Bryson, 2018; Gambel et al., 2019). Optimal success requires an

alignment at all levels of the organization for better understanding, acceptance, and support of

the value proposition (Austin et al., 2016).

Value must increase for the overall cost of care to decrease (Kaplan et al., 2014). VBHC

delivery requires reducing costs and improving processes without sacrificing outcomes (Porter,

Kaplan, & Frigo, 2017). Value increases with lower costs, improved quality and services, and

enhanced capabilities (Gambel et al., 2019). Certain PaLM activities demonstrate value by

directly improving costs (Halstead et al., 2018; Price et al., 2016), while others improve

efficiency, quality, or skills (Kushik et al., 2018; Lewandrowski et al., 2018; Schmidt &

Ashwood, 2015). The literature remains sparse regarding the value contributions of laboratories,

which are under recognized as an essential care component (Davis et al., 2018), and requires a broader perspective assessment (Anonychuk et al., 2012).

Role of the Researcher

The role of a researcher is to present objective research and prevent biases by attempting to control the research design for validity, credibility, and reliability, despite philosophical assumptions (Baxter & Jack, 2008; Burns & Grove, 2007). Qualitative research involves gaining access to a site and permission to collect data (Creswell & Poth, 2018). The role of the researcher in this study was to identify multiple hospital sites with variability factors; evaluate publicly available information for each site; and initiate contact with the site's laboratory leadership and hospital administrator. Interviews were conducted with selected voluntary participants using the interview protocol. The goal was to interview at least one hospital administrator, preferably the CEO or other C-suite representative, and two laboratory leaders at each of the three hospital sites. Audio-recorded interviews were conducted with voluntary participants, documenting the setting, and transcribing the interviews. Case-study protocols were closely followed for collecting, sorting, and analyzing the data. Adequate detail was gathered to enhance the overall quality and trustworthiness of the study (Baxter & Jack, 2008). The data were analyzed from each case using a cross case analysis and the evidence was correlated with the literature (Stake, 2006).

I was responsible for formally soliciting volunteerism, acquiring the informed consent from all participants, alerting participants to the nature of the study (Yin, 2018). Interviews were scheduled catering to the interviewee's availability with an understanding that unanticipated events could change their availability (Yin, 2018). It was important to become an observer when entering the world of the participant, maintaining constraint and respectfulness (Yin, 2018). Each

participant read and signed the informed consent and assurance of confidentiality form (see

appendix A). The IRB of Liberty University authorized this study.

Research Methodology

Qualitative inquiry designs of narrative, phenomenology, and ethnography, involve

themes from interview data, yet are more appropriate for capturing the rich details of stories,

describing the essence of a lived experience, or focusing on a culture exploring issues, beliefs, or

behaviors (Creswell & Poth, 2018). Two qualitative study designs offer applicability for this

research, grounded theory and case study. Grounded theory applies to this study, since no

explanation or understanding in the literature exists (Creswell & Poth, 2018) regarding the

communication of laboratory VBAs, other than analytical testing and performance. The

grounded theory design allows new theories to emerge in data collections within healthcare

settings (Astalin, 2013; Butina et al., 2015; McCrae & Purssell, 2016). However, Creswell and

Poth (2018) recommended that grounded theory studies need 20 to 60 individual interviews, with

clarifying re-interviews, which are not feasible due to the time constraints.

Quantitative study designs include descriptive (nonexperimental), correlational

(experimental), and casual comparative (quasi experimental) (Drummond & Murphy-Reyes,

2018). Quantitative research permits an accurate assessment of cause-and-effect relationships

between variables or seeks an explanation from the causal relationships or variable correlations

for prediction, generalization, or explanation (Creswell, 2013). A quantitative design was not

applicable for this study, as cause-and-effect was not the intent of this research. The mixed-

method study is perhaps the most comprehensive design by expanding inquiry and strengthening

conclusions, yet remaining flexible (Tashakkori & Creswell, 2007). Palinkas et al. (2015) noted

the preferable design is the mixed-method for healthcare research due to the complexities

involved with implementing evidence-based practices and programs. However, as a novice researcher the management of the dual methods is too difficult (Creswell, 2013).

Discussion of the Case Study

The method for this research was the qualitative multi-case study targeting the phenomenon of the communication of PaLM VBAs. The qualitative case study is the design of choice when the problem is poorly understood and needs inductive (data driven) research for a better understanding (Simon, 2011). Case study research aids in an understanding of a simple or complex situation by asking *how* and *why* type questions, while considering the context of the situation (Baxter, & Jack, 2008; Yin, 2014) and exploring the processes or activities (Creswell, 2013). A common example of a multiple-case study involves hospitals, where each hospital represents a single-case (Yin, 2018).

Discussion of Flexible Design

The case study design permits an exploration of programs, events, processes, or activities (Creswell, 2013). Although a single case may yield invaluable insight, the multi-case study is stronger (Yin, 2018). Stake (2006) describes the multi-case design as a collective study, primarily concerned with the quintain or the phenomenon, rather than the individual case. Multiple cases in this study increase the robustness of the research (Hogan et al., 2018; Long & Hollin, 1995). The multi-case study requires gathering data and describing situations to gain a deep understanding of the phenomenon (Leedy & Ormrod, 2015). The collective nature of a multi-case hospital study allows for exploration of the quintain, underlying principles, and identification of commonality across multiple sites (Baxter & Jack, 2008). In a cross-case analysis, the research makes assertions from the evidence of each case, showing either uniformity (agreement) or disparity (non-agreement) across the cases (Stake, 2006). The

collective case study design is appropriate for this contemporary issue that involves several laboratories across multiple sites (Creswell & Poth, 2018).

Summary of Research Methodology

A multi-case design guided the examination of the communication of laboratory leaders with hospital administrators in different environments (Stake, 2006) with an analysis of each case. This multi-case study provided an opportunity to gain insight into each case by audio recording interview responses from participants. This qualitative multi-case case study was designed to investigate the communication and messaging effectiveness allowing for descriptive accounts from multiple perspectives with generalizable results (Creswell & Poth, 2018; Stake, 2006). The case study design provides an in-depth analysis of multiple cases, using the logic of replication in inquiry procedures for each case (Yin, 2014). While the entire study is one case involving the exploration of the communication of VBAs, the boundaries of the multiple participant cases were defined (Yin, 2014).

Participants

Participants were limited to the hospital administrators and laboratory leaders able to supply the necessary information on communicating VBAs by participating in interviews (Creswell & Poth, 2018; Yin, 2014). The solicitation of voluntary participants began by seeking interviews with hospital administrators and laboratory leaders from the purposively selected acute care hospitals. Attempts were made to make initial contact via professional networking sites, targeting identified hospital executives and laboratory leaders, offering information about the study, and requesting voluntary participation. Subsequent recruitment attempts were sent via e-mails to potential hospital participants based on publicly available information obtained from hospital websites. Names of potential participants were identified by referencing the hospital's

website, ACHE, JC, or CAP. Participant referrals were also accepted and found to be the most

effective form of recruitment.

Discussion of Participants

Engaged leaders play a role in the selection and implementation success of VBAs,

ensuring adequate resources and training, role assignments, and performance monitoring

(Carman et al., 2014; Dickerson et al., 2017; Price & St. John, 2014; Wagar et al., 2019).

Leadership authorizes the departmental activities that various disciplines use to create value,

setting the tone for participation (Carman et al., 2014). Wagar et al. (2019) referred to the role of

the laboratory director as an *interface*, or the critical intersect for "differences in needs, values,

interests, and/or knowledge" (p. 13). The laboratory primary interface factor was an unknown

variable determined by correlating the perspectives from interview responses (Denzin, 1989), as

this information was not available at the time of case sampling. The interviews laboratory leaders

sought included the pathologist, DCLS, and clinical laboratory scientist manager as the primary

hospital interface (Nadder et al., 2018). Healthcare administrators included C-suite leaders

(Buchanan, et. al., 2013).

The participants for this study were over 18 years old, knowledgeable of VBAs, and

worked full time at the selected hospital site for more than one year. Participants voluntarily

agreed to participate in a semi-structured recorded interview, responding to an interview protocol

(see appendix C). Each participant was provided with an opportunity for feedback on his/her

interview transcript for clarity. The laboratory director as the administrator served as the site

sponsor, granting support and access for this study (Carman et al., 2014). The hospital

administrator offered a supplemental perspective of the laboratory leadership's effectiveness in

communicating VBAs and strategic alignment.

Ethical Protections

Privacy and confidentiality are important for protecting human participants (Yin, 2018). Participants were provided with an informed consent (see appendix A), alerting them to the nature of the study prior to interviews (Yin, 2018). The data were relevant to the research questions and provided adequate details for analysis and replication (Silverman, 2017). Although the names of each participant and site were collected, confidentiality was protected by redaction of identifiers and use of pseudonyms in published reports and presentations. A confidential paper log, not stored with the electronic files of interview data, links the pseudonyms with the actual participants and sites. Participants received an e-mailed copy of their interview transcript and were afforded an opportunity to provide feedback or clarification. All interviewees were permitted to ask clarifying questions during the interviews or decline to answer questions.

Population and Sampling

The pre-selection of cases in a multi-case study begins with partially identifying cases before the research begins due to the case binding features of the design (Stake, 2006). Selected Texas hospital cases were bound by acute care type, onsite 24-hour emergency care and laboratory services, online access of laboratory results, and publicly reported quality measures. The multi-case study approach does not rely on representative sampling logic, thus the typical criteria regarding sample size is irrelevant (Yin, 2014). General guidelines for a small sample size in qualitative research take into consideration the extensive volume of rich details studied within each case (Creswell & Poth, 2018). More than one case dilutes the level of detail the researcher can provide (Wolcott, 2008), while even a small number of cases bolsters generalizability, notably in qualitative research of professional practices (Stake, 2010).

Purposively selected cases with information from multiple data sources within each case achieved the purpose of this study (Creswell & Poth, 2018).

Discussion of Population

The Medicare Hospital Compare (2019) website aided the purposive selection of cases. Creswell and Poth (2018) pointed out the importance of maximum sampling variation in population selection, noting that differentiation factors increase the likelihood that the findings reflect differing perspectives. Differentiation factors include variation in CMS's star quality ratings, bed size, and laboratory accreditation agency. The bindings of the population type created the commonality necessary to draw generalizations among the cases (Patton, 2002). Initial bindings of Texas acute care hospitals were expanded to hospitals with on-site 24-hour emergency care and laboratory services, patient online access to laboratory results, public reporting of quality measures. Case bindings improve the generalizability of findings (Creswell & Poth, 2018). Specialty hospitals, such as orthopedic or spine centers, pediatric hospitals, heart centers, and outpatient surgical centers were excluded from this study.

Discussion of Sampling

Purposeful sampling, referred to as theoretical sampling in grounded theory, identifies information rich cases (McCrae & Purssell, 2016). Purposive sampling, commonly used in qualitative research, is most effective when resources are limited (McCrae & Purssell, 2016; Patton, 2002). Whereas convenience sampling offers no inclusion criteria and identifies participants wherever convenient (McCrae & Purssell, 2016), purposive sampling entails intentionally selection of cases and participants to yield rich details related to the quintain (Patton, 2002; Stake, 2006). The main criteria in case selections are the inclusion of diversity,

relevancy toward the research goals, and a good opportunity to learn about the context (Stake, 2006).

The sampling variables in this study are determined by assessing Medicare's quality - ratings, which demonstrates the organization's cultural alignment with quality (AHA, 2017; Medicare, 2019). CMS' ratings summarize value with up to 57 publicly reported quality measures that encourage hospitals and providers to reduce unnecessary care and waste (Medicare, n.d.; Medicare, 2019). The number of hospital beds provided a context for capacity, as well as a benchmarking tool (Carman et al., 2014; Harrison, 2010). Laboratory accreditation agencies approved under the federal CLIA laws (Centers, 2019c), represented another sampling variable. The relevant laboratory accreditation agencies were CAP and JC, which also had a searchable website for accredited laboratories (CAP, n.d.; JC, 2018).

Table 6.

Sampling Variability Factors

Hospital Site (case)	Characteristics
Hospital beds	Number
Medicare quality rating*	Star rating system (1-5)
Lab accreditation	CAP / JC / other
Primary hospital interface	PATH / DCLS / CLS / O

* Retrieved from www.medicare.gov/hospitalcompare/About/Hospital-overall-ratings.html

Table 7.

Features of Each Hospital Case

Factor	Hospital 642	Hospital 510	Hospital 750	Hospital 302
Hospital beds	222	352	120+	556
Medicare quality rating	4 Star	3 Star	3 Star	3 Star
Laboratory accreditation	CAP	CAP	CAP	JCO
Identified primary interface	Laboratory Medical Director	Laboratory Medical Director	Laboratory Administrative Director	Laboratory Administrative Director
Participant pseudo names	Dr. Barb	Dr. Mark, CMO Dr. Mick Mary	Larry, Anc. VP Dr. Lem Luke	Tracy, Exec. Terry

Summary of Population and Sampling

Acute care hospitals were targeted to explore the communication of PaLM VBAs. Interviews with three hospital administrators and six laboratory leaders provided data from nine interviews. While the aim of statistical sampling in quantitative research is an inference to the population (McCrae & Purssell, 2016), qualitative study participants are selected for the likelihood of having information about the *quintain* (McCrae & Purssell, 2016; Stake, 2006). The purposive case selections included bindings of acute care hospitals with onsite 24-hour emergency care and laboratory services, electronically available laboratory results, and publicly available quality of care measures from Medicare Hospital Compare (2019). Variations in the case samplings were the key differentiation factors that included the number of hospital beds; the star quality rating (Centers, 2021b); the laboratory accreditation agency; and primary interface.

Data Collection & Organization

The most common methods for gathering data in a case study are observations and interviews with coding and interpretation (Stake, 2006). The interview transcript provides the

primary source of data with rich details describing each participants' experiences and the understood value from those experiences (Rubin & Rubin, 2012). The interviews were primarily concerned with collecting information about laboratory leaders' communication of PaLM VBAs, rather than the interviewee or the hospital site. Probing interview questions invoked comments concerning the phenomenon using open-ended phrasing in a semi-structured interviews format (Castillo-Montoya, 2016; Stake, 2006).

Instruments

Data sources included interview transcripts and journaling notes from meetings with participants (Creswell & Poth, 2018). The interview protocols were the primary instrument of inquiry (Castillo-Montoya, 2016). No supplemental documents were shared by participants as an additional data source (Creswell & Poth, 2018). As the primary data collection tool, the researcher needed to have sufficient resources while working in the field, i.e., a recording device, adequate power supply, pen and paper, and a cell phone in case assistance was needed (Yin, 2018). The researcher as the instrument of analysis made the judgment for coding, themes, and contextualization of the data (Nowell et al., 2017).

The participation packet for prospective participants consisted of Informed Consent (Appendix A), which was e-mailed to participants prior to the interviews. Participants signed the consent prior to interviews. The inquiry-based recorded conversations occurred using the Interview Protocol (Appendix C). Social rules of ordinary conversation were followed with a variety of open-ended questions in quiet settings (Castillo-Montoya, 2016) using guiding scripts and everyday language (Brinkmann & Kvale, 2015).

Data Collection Techniques

There are three types of data collection interviews: the unstructured informal conversation, without interview questions prepared in advance; the semi-structured interview with a list of themes or key questions guiding the conversation; and the structured or standardized pre-determined questions, identical for all interviewees (Barcik, 2016). Interviews occurred face-to-face, although video conferencing with web-based recordings were an option, e.g., Zoom, WebEx, GoToMeeting, or Skype (Creswell & Poth, 2018). The interviewer accommodated the requests of all interviewees for face-to-face meeting locations. The interview protocol included a script to guide the interview processes including introductions, provision of a confidentiality statement and informed consent, and an option to withdrawal from the study (Jacob & Furgerson, 2012).

Interviews stayed within the boundaries of predetermined protocols using guided questions, time limits, and etiquette (Creswell & Poth, 2018). With an interest in the topic, I utilized the literature review to develop interview questions grounded in the literature (Jacob & Furgerson, 2012). The semi-structured interviews allowed for collection of verbal responses to questions, and better acquaintance of the researcher with the site (Creswell & Poth, 2018). Since the semi-structured interview questions were open-ended, follow-up questions could be used for clarity (Creswell & Poth, 2018). The alignment of the interview questions with the research questions (see Table 11) confirmed their purpose and ensured each question's necessity (Castillo-Montoya, 2016). Transition statements between questions, as well as thanking each participant for their responses, were appropriate (Castillo-Montoya, 2016). Audio recorded interviews were transcribed the same day to capture impressions and ensure that the conceptual framework was not limiting exploration (Baxter & Jack, 2008; Stake, 2006). While Yin (2014)

recommended a pilot test to refine the data collection plan and relevant lines of questioning, Stake (2006) noted that meager budgets and time are lost in pilot testing. Obtaining feedback following the interviews did not reveal a need to revise the questions once in the field.

Data Organization Techniques

Data collection began by researching the literature for the applied business problem. Reference literature and study notes were imported, tagged for topics, and stored in Mendeley V.1.19.4. Other computer applications aided with transcription of the audio-recorded interviews and the identification of text segments for code labeling (Creswell & Poth, 2018). Interviews were transcribed ensuring enough conversation detail to enhance the overall quality and trustworthiness of the study (Baxter & Jack, 2008). Systematic management of the data was required including the recorded interviews with same-day transcription.

Although computer programs aid in the organization and retrieval of large data files, expert judgment for conceptualizing and coding the data required human intellect (Nowell et al., 2017). The highly regarded computer-aided qualitative data analysis software Atlas.ti and MAXQDA were not utilized for data coding, aggregation, query, and visualization mapping. All such programs have advantages for optimizing data management and providing the ability to hyperlink references, but do not eliminate the need to develop codes or analyze texts (Creswell & Poth, 2018). The disadvantages of these programs include the extra time investment in learning the program's functionality, manual set up of coded text tables, inability to see prior codes once recoding occurs, limited guidance for the end user, and the financial cost (Creswell & Poth, 2018). NVivo provided a tool for improved validity and reliability.

Summary of Data Collection and Organization

"Knowledge is constructed in the interaction between the interviewer and the interviewee" (Brinkman & Kvale, 2015, p. 4) as the researcher attempts to understand the phenomenon (Stake, 2006). Although data collection relies on the individual interviewee, the unit of analysis is the collective data from all cases, with research conclusions based on multiple perspectives (Yin, 2018). Interview questions were open-ended, thematic sub-questions aligned from the research questions and designed to gather data on the communication of VBAs (Brinkmann & Kvale, 2015; Creswell & Poth, 2018). Interview sessions begin with an explanation of the study's purpose and end with thanking participants for participation and asking additional interviewees referrals (Creswell & Poth, 2018). Data analysis and storage occurred in NVivo. Consent documents, progress reports, and IRB records related to this study will be stored for 3 years by Liberty University in accordance with Federal Regulation 45 CRF 46, then destroyed.

Data Analysis

Research in the health sciences frequently utilizes encoding (Creswell & Poth, 2018). Analysis of coded data involved pulling the data apart, developing categories into established patterns or themes, and then putting the information back together in a meaningful way (Creswell & Poth, 2018). The simplest approach applies a theme-based description of the quintain to each case's findings (Stake, 2006), although procedures for thematic analysis are substantially lacking in the literature (Nowell et al., 2017). Thematic analysis produces a rigorous and high-quality analysis (Clarke & Braun, 2017). Themes surrounding the VBAs, communication of VBAs, and strategic alignment of VBAs emerged within each case's

transcribed and coded interviews. As Stake (2006) recommended a cross-case analysis followed

by a correlation with evidence from the literature was performed.

Coding, Themes, and Emergent Ideas

The first step in data analysis was developing an organized database for the transcribed

interviews and journaling notes (Creswell, 2016). Each transcript was reviewed prior to

beginning the coding process to get a big picture view of each interview and case (Löfgren,

2013). Coding involved determining meaning by bracketing segments of texts and ascribing code

labels to text passages (Creswell, 2016). Direct interpretation of the interview data involved

pulling the data apart and looking at single phrases for meaning (Stake, 2006).

Codes, the smallest units of analysis, capture the information relative to the research

questions (Clarke & Braun, 2017). Groups of codes built the evidence to support themes

(Creswell, 2016; Löfgren, 2013). Aggregated data from each case developed into large clusters

of ideas, which were collapse into themes (Creswell & Poth, 2018). The collapsing of codes,

referred to as reduction, typically consists of 20 to 30 codes reduced to 6 or 7 themes (Creswell,

2016). Bracket resulted in 32 codes that were reduced to 10 overarching themes. The NVivo

software application helped to "store, analyze, report, and visualize the codes and themes"

(Creswell, 2016, p.153). Themes surrounding the types of VBAs, communication, and strategic

alignment emerged within each case's transcribed and coded interviews.

Immersion into the data with repeated readings was vital to search for meanings and

patterns (Nowell et al., 2017). I analyzed each case for clusters of ideas to code, grouped together

themes, and then analyzed across all cases for similarities and differences (see figure 6). The

research design required linking the collected data and conclusions back to the original research

questions through the process of categorical aggregation (Creswell & Poth, 2018; Yin, 2018).

Multi-sourced assertions were made and strengthened with supportive evidence from the literature (Stake, 2006).

Saturation

Thick descriptions allow validation from the reader's perspective (Stake, 2010), enabling them to transfer the findings to other situations by use of strong action verbs and quotes (Creswell & Poth, 2018). Grady (1998) purported that data saturation occurs at the point in which the interviewer begins to hear the same comments again, and again. Code saturation identifies the point at which no additional codes are identifiable in the data set, and the codebook begins to stabilize, which typically occurs with nine interviews (Hennink et al., 2017) as opposed to meaning saturation which may require 16-24 interviews for a rich textured understanding of issues. Yin (2014) recognized that even a small number of cases can achieve data saturation. Nine interviews with rich data from multiple perspectives were adequate to achieve data saturation.

Cross-Case Synthesis

Individual cases were analyzed before beginning the reductive process and cross-case analysis (Stake, 2006). Each case analysis factored in the data from the site's interview with pertinent details (Creswell & Poth, 2018). Cases were summarized for context with descriptive findings. I then returned to the data for the broader cross-case analysis (Baxter & Jack, 2008; Yin, 2003). The main activity when analyzing cross-case data involves applying the findings back to the original research questions (Stake, 2006) (see Figure 6). Intensive analysis of themes and subthemes leads to the development of a theoretical proposition, that when cross-referenced against multiple data sources tests for *trueness* (Silverman, 2017). The cross-case analysis with theme correlations were examined based on evidence from the literature (Stake, 2006).

Evidence-based assertions provide credibility with logical persuasion (Stake, 2006). Cross-case thematic analysis elucidated differing perspectives, highlighting the similarities and differences, and generating unanticipated insights applicable to the population (Braun & Clarke, 2006; Creswell & Poth, 2018; Yin, 2014).

Interpretation and Final Report.

A final report structure consists of an opening vignette, introduction of the cases, research procedures, extensive narrative of the findings with identified issues, integration of the interpretations with the literature, and a closing vignette (Creswell & Poth, 2018). Key assertions were repeated in several ways with illustrations from the interviews improving validity and the reader's interpretation (Stake, 2006). The final narrative report consists of a variety of quotations from the interview data demonstrating multiple perspectives. Pseudonyms protect the confidentiality of participants and anonymity of the hospitals.

Figure 6.

Multi-case Study Coding and Analysis Approach
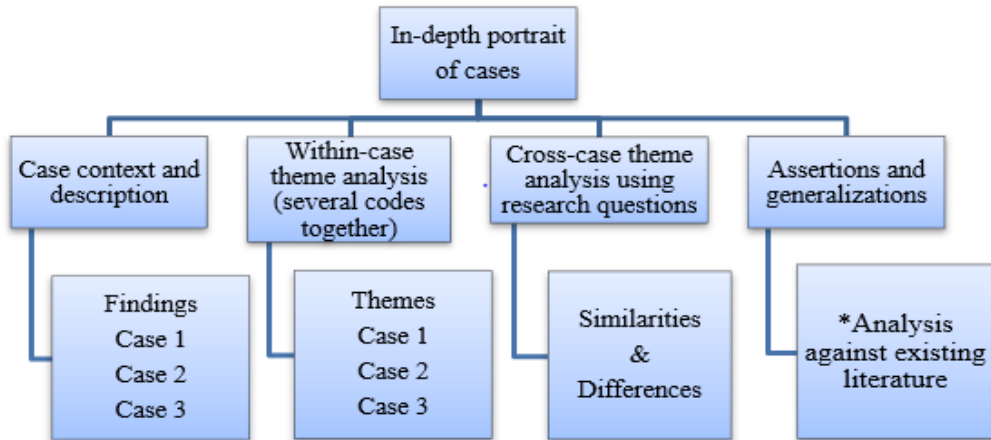
(Creswell & Poth, 2018)

Triangulation.

This study began with consideration for how to use the literature in tandem with the collected data (triangulation), using the researcher's lens (Creswell & Poth, 2018). Triangulation consisted of multiple sources including the literature, to develop a comprehensive understanding (Carter et al., 2014). Corroborating evidence was derived from different sources, multiple case interviews, evaluation across multiple cases, and correlation with the literature (Creswell & Poth, 2018). Controversial and important findings required more than a single source as supportive evidence to ensure that meanings were not overlooked (Stake, 2006). Denzin (1989) advised that triangulation requires a second, third, or even more perspectives for correlation. Triangulation from a variety of sources promotes credibility or the trueness of the findings (Baxter & Jack, 2008). Triangulated evidence is credible and substantiating, although the process reveals that situations are often more complex than initially thought and data disagreements require careful evaluation (Stake, 2010).

Summary of Data Analysis

Audio recorded interviews were transcribed and coded. Coding transcripts manually or with a computer-aided program requires the same effort from the researcher in terms of bracketing of segments, assigning of code labels, and developing themes (Creswell & Poth, 2018). NVivo was chosen for data storage, sorting, retrieval, concept mapping, and visualization of the code networks (Nowell et al., 2017). An orderly database preserves the data in a retrievable format (Yin, 2018).

Interview data was bracketed, coded, and reduced into themes. Nine interviews across multiple cases achieved data saturation. Analysis and summarization of each case was followed by a cross-case synthesis. Aggregated themes were examined against the evidence from the literature which strengthens generalizations. This synthesis plan triangulates the findings for creditable assertations with logical persuasion (Stake, 2006). Triangulation, the preferred validation for a post-positivist researcher, required connecting findings to supporting evidence for corroboration (Creswell & Poth, 2018; Yin, 2014).

Reliability and Validity

LeCompte and Goetz (1982) noted that if quantitative research had a scientific process for reliability and validity, then qualitative research required parallel internal and external validation processes. Lincoln and Guba (1985) refined qualitative research concepts of credibility, transferability, dependability, and confirmability. Reliability in thematic analysis involves the reproducibility of the study and ensuring minimization of error and bias. Reliability involves the case study protocol and the database (Yin, 2018), bringing credibility to the research with confidence in the data and the study's findings (Burns & Groves, 2007). Credibility enhances with prolonged involvement in the setting, triangulation, and peer examination of the

data (Baxter & Jack, 2008). Analysis requires enough detail to enable the reader to determine the credibility of the methods and the interpretations (Nowell et al., 2017).

Validation was essential for the inquiry to be of value to other researchers (Creswell & Poth, 2018). The qualitative case study provides a framework for data collection using a scientific structure for the analysis and validation of findings (Creswell & Poth, 2018). Validity reduces the likelihood of *misinterpretation* (Stake, 2006). Strategies of validation involve several for assessing the *accuracy* of the findings (Creswell, 2016/2018). The researcher's philosophical orientation influences the chosen validation strategy (Creswell, 2016).

Reliability

Reliability occurred within the protocols for the interviews, the participation packet, and the approval of the human relations review board (Creswell & Poth, 2018). Reliability occurred by documenting and following the same protocol for each case and interview, using the same scripts and open-ended questions to ensure credibility and trustworthiness of the data (Stake, 2006; Yin, 2018; Castillo-Montoya, 2016). Additional protocols included the pre-interview analysis of publicly reported value-based measures for each site, identification of site variability factors, and same-day journaling by the researcher (Yin, 2018). Reliability of the interview data was enhanced with a good quality audio recording (Creswell & Poth, 2018) and with the use of NVivo to calculate encoding (Silverman, 2017).

Validity

A validation strategy that encompasses the reader's lens involves rich data or thick descriptions (Creswell & Poth, 2018), that allow the reader to make the decision regarding the transferability of findings (Lincoln & Guba, 1985; Merriam & Tisdell, 2015). Validation from a reader's lens may occur with peer debriefing, allowing others to ask questions about the

methods, meanings, and interpretations (Creswell & Poth, 2018). The participant lens validation

occurred by permitting participants to review his/her own interview transcript and to offer

clarifying statements (Creswell & Poth, 2018), and accepting clarifications as a form of external

accuracy check (Creswell, 2016; Yin, 2018). A researcher's philosophical orientation influences

the chosen validation strategy (Creswell, 2016).

Summary of Reliability and Validity

PaLM practitioners live in a quantitative scientific world, performing experiments, data

collections, and test validations (Butina et al., 2015). Laboratory practitioners understand the

need to define the intended use of a test, examine possible sources of error from sample

variations, and follow appropriate testing procedures (Jennings et al., 2009). Qualitative research

methods, however, remain largely unknown in the medical laboratory profession (Butina et al.,

2015). Reliability occurs in this study by repeating the same procedures for each case, utilizing

quality audio recordings with the interview protocols, and using computer software to calculate

encoding. Multiple data sources enhance the credibility of the findings. Trustworthiness

improves with the open-endedness of the interview questions and participants' review of

transcripts with any clarifications.

Validation in the medical laboratory involves determining wither a test is ready to be

implemented into clinical practice, by identifying and quantifying potential sources of variation,

and analyzing the closeness of agreement between the found value, against the *accepted as*

conventionally true value or the reference value (Jennings et al., 2009). Similarly, validation in

the qualitative study involves analyzing data similarities and differences across cases and

examining of the closeness in agreement with evidence from peer data and the literature.

Creswell (2016) and Creswell and Poth (2018) recommend choosing at least two comfortable

validation strategies considering the perspective of the researcher, the participant, and the reader. For this research, triangulation was used to substantiate the evidence (Stake, 2010) and rich contextual data from purposively selected cases with a minimum of nine interviews was used to reach data saturation (Hennink et al., 2017).

Summary of Section 2 and Transition

This multi-case study utilized confidential audio-recorded semi-structured interviews with laboratory leaders and acute-care hospital administrators to provide evidence of the communication efforts regarding VBAs. The identification of the common PaLM activities within the value-chain provides evidence of the essential activities necessary for value creation and for alignment with VBHC strategies promoting performance improvement, safety, quality outcomes, and cost savings (Carman et al., 2014; Porter, 1985; Swayne et al., 2006). The collective nature of this study allowed for the generalization of findings from multiple perspectives (Stake, 2006; Creswell & Poth, 2018). A maximum sampling variation strategy utilizing the factors in Table 7, improved the likelihood of credibility in the findings by reflecting differing perspectives (Creswell & Poth, 2018). Probing interviews provided the primary data source (Stake, 2006). No other acceptable forms of data were collected in the field including workplace documents, reports, or job descriptions (Creswell & Poth, 2018; Silverman, 2017; Yin, 2014). As the primary instrument for the data collection and analysis, I utilized interview protocols to collect reliable data (Yin, 2018), then transcribed, organized, and coded the information (Creswell & Poth, 2018). Prior to uploading information into NVivo for a cross-case thematic analysis, each participant was provided an opportunity to analyze their own transcript and provide feedback which improved the credibility and validity of the data (Creswell & Poth, 2018; Stake, 2006).

Section 3: Application to Professional Practice and Implications for Change

Texas PaLM leaders identified activities contributing six forms of value. PaLM VBAs improved hospital competitiveness, customer service, efficiency, effectiveness, quality, and costs, i.e., the attributes of the value-chain found in the mVCM framework from Section 1 (see Fig. 2). Although Texas hospital administrators had not requested demonstrations of value from laboratory leaders, measures from patient testing, laboratory data, and turnaround times aided hospitals in the achievement of accreditation and status goals.

Laboratory leaders utilized seven forms of communication when responding to the requests of hospital leaders. As hospital leaders had not requested cost savings information, laboratorians only presented cost savings when actively participating in system-wide contract negotiations. Hospital administrators did not assess PaLM quality or efforts to improve costs. While cost-savings demonstrations were described as desirable by hospital administrators, cost-saving reports were not requested. Hospital administrators acknowledged the value associated with PaLM's high-quality testing. PaLM leaders regularly communicated performance data using a variety of forums, assisting the organization in meeting accreditation and status goals. Quality, however, is not directly related to healthcare costs (Burke & Ryan, 2014). As Wong & Hilborne (2021) pointed out, the laboratory's analytic quality alone is insufficient for achieving appropriate utilization. Laboratory stewardship, a term implying responsible management of resources (Jongeward, 2021), was identified as an import role for hospital laboratorians. Participation on a laboratory stewardship committee brought awareness and support for improvement opportunities.

Overview of the Study

Three executive level hospital administrators, three PALM medical directors, and three laboratory administrative directors were interviewed to gain insight into the communication of PaLM VBAs. Nine interviews from three purposively selected hospitals cases were targeted for the achievement of code saturation (Hennink et al., 2017). Scripted interview questions were designed to capture the details of PaLM leaders' communication efforts and the perceptions of hospital administrators (see Section 2, Fig. 7). Interviews were recorded, transcribed, and uploaded into NVivo software for data organization and coding. Data immersion occurred with multiple exposures to the data, including the face-to-face interviews, transcription of the audio recordings, and reading and coding transcripts. Each hospital case was analyzed individually, followed by cross case categorical aggregation for development of relevant themes and an analysis of the findings. Three overarching themes emerged from the data: PaLM VBAs, PaLM communication efforts, and PaLM VBA strategic alignment.

The Robbins et al. (1994) communication model offered guidance for clarifying the communication sender, message, receiver, and delivery channels (see Section 1, Fig. 1). PaLM leaders as the messenger of VBAs, and hospital administrators as the receivers of PaLM's messaging, were interviewed face-to-face with probing questions aimed at the communication of PaLM VBAs and the discovery of lost cost savings opportunities. VBAs were categorized based on the value attributes identified from the participants. VBAs were then applied to the mVCM conceptual framework (see Fig. 2) and validated with the literature. The identified categories of PaLM VBAs included competitiveness, cost improvement, customer service, effectiveness, efficiency, and quality (see Fig 11). The themes of VBA strategic alignment (see Fig. 12) that emerged were feedback from hospital administrators, assessments for PaLM services, and

hospital goals. Anticipated versus actual findings were considered then applied back to the original research questions.

Presentation of Case Findings

The four hospitals and nine interviewees were pseudo named for anonymity. Three of the hospital laboratories were CAP accredited and one JCO accredited. All four hospitals were JCO accredited and varied in bed size from 120 to 556. All hospitals were part of a larger health system found to utilize system level dashboards for quality and performance improvement reporting. Hospitals H510, H750, and H302 were rated 3-Stars by Medicare, while H642 had obtained a 4-Star status. The primary laboratory interface identified in each case varied between the medical director and the administrative director, and no DCLS was identified (see Table 7). All laboratory participants noted service alterations related to the Covid-19 pandemic. Consistent with recent workforce studies (ASCP & CHW, 2021), the participants reported hardships associated with an increased number of patients and testing, workforce shortages, and workflow changes relative to the Covid-19 pandemic. PaLM leaders discussed the necessity of accurate, rapid, high-throughput testing for SARS-CoV2. H510 improved laboratory productivity by shifting phlebotomy services to nursing and adding a technologist position. H302 shifted nurse-collected nasal swabbing to the phlebotomists. H710 expanded outreach testing. H642 moved Covid PCR testing in house and offered specialized training on blood culture collections.

Findings from Case H642

H642 consisted of one interview with Dr. Barb, the laboratory medical director. Dr. Barb, an engaged physician pathologist, was knowledgeable of PaLM VBAs and communicating with hospital administrators. Dr. Barb identified herself as the primary interface with hospital

administration and commented on attending "an extra three-day course with the College of

American Pathology to improve oversight of the clinical pathology side."

H642 Communication.

Dr. Barb ensured that hospital administration received an annual written report on

pathology activities, and a quarterly report of the clinical laboratory's quality metrics. Dr. Barb

participated on interdisciplinary committees and attended monthly operational meetings with the

laboratory administrative director. A lack of time was identified as hindering VBA

communication. Dr. Barb stated, "My biggest barrier is giving time to putting the reporting

together."

H642 VBAs.

Dr. Barb identified many VBAs within the first few interview questions. For instance, she

described how patients benefitted from the implementation of clinical algorithms and the process

improvements made for resulting positive screening tests. A newly hired blood bank specialist

was described by Dr. Barb as enhancing the core competencies of the hospital and a lab-initiated

training project on sterile technique had improved blood culture quality, avoiding downstream

costs. Dr. Barb used her clinical expertise in the selection and implementation of new testing

platforms, which had improved turnaround time, throughput, and costs. Dr. Barb said that the

decision to insource a test had reduced "the costs to the health system from $65 per test to $25

per test saving both time and money." Dr. Barb also described moving Covid testing in house as

an improvement in efficiency and costs.

H642 VBA Alignment.

No hospital administrator interviews occurred for case H642. Therefore, insights on

hospital strategic goals are limited for this case. Dr. Barb clarified that the laboratory received

organizational direction from the top, adding that "hospital administration determines which of the meetings I should attend." Dr. Barb saw VBHC as an emerging strategy within her health system, which had not yet been fully developed.

Findings from Case H510

Three H510 interviewees participated in this case study. Mary, the laboratory administrative director, was interviewed in a private room away from her busy work atmosphere. Interviews with Dr. Mick, the PaLM medical director, and Dr. Mark, the chief medical officer, occurred in their respective offices. Identified in case H510 was the use of a surveys to evaluate PaLM services. Dr. Mick and Mary were engaged PaLM leaders, eager to share their VBA experiences. Dr. Mark participated with the laboratory on a system level stewardship committee.

H510 Communication.

Mary participated in several multidisciplinary committees, receiving and giving information with other hospital leaders. Mary led daily huddles with her department and routinely met with a "one-up in hospital administration to discuss wins and struggles." Mary mentioned escorting hospital administrators on tours of the laboratory and reporting laboratory quality data, performance improvement data, and "any other requested measures." Mary spoke of satisfaction surveys, noting the "high scores in the outpatient phlebotomy department." Dr. Mick said that customer satisfaction surveys were a primary focus for the organization. Mary explained that the hospital used three types of surveys for physician feedback, patient experience, and employee satisfaction.

Dr. Mick attended the medical executive committee for the purpose of giving and receiving information from physicians and hospital executives. When asked about communication barriers with hospital administrators, Dr. Mick said "only a lack of engagement"

could hinder effective communication. Dr. Mick added, "We have a familiar saying with laboratorians, they tend to hide in the laboratory and very few want to be out there." Dr. Mick and Mary participated on the laboratory stewardship committee, described by Dr. Mick as "a good forum." Dr. Mick added "if a hospital does not have a laboratory stewardship meeting, then I would highly suggest they get one, especially if they are part of a system."

H510 VBAs.

PaLM VBAs were identified by Dr. Mick and Mary. Dr. Mick and Mary monitored quality assurance in the laboratory with measures for testing quality, accuracy, and turnaround times. Dr. Mick mentioned that provider notification of critical findings was an important customer service tool. Mary identified autoverification as an activity that improved efficiency. Mary offered expertise in the assessment and implementation of new equipment, which had improved quality, turnaround times, throughput, and costs. Mary identified that the highly engaged and productive laboratory employees were a value to the organization. When speaking of hospital participation Mary said, "I try to make sure that the laboratory is participating…being out there and participating in many things."

H510 VBA Alignment.

Dr. Mark, the Chief Medical Officer, revealed that the primary assessment of PaLM services was feedback from customer surveys. Dr. Mark said, "how our physicians rate our laboratory and pathology services is from a customer perspective, not from a cost perspective." Mary knew that hospital administrators assessed customer survey responses and acknowledged that cost savings efforts from the laboratory were not requested. Mary said her annual performance evaluation was "based on physician satisfaction and employee retention, the goals set by hospital administration." Mary was uncertain if a budget existed for her department other

than for "the review the lab's units of service, billable tests, and hours worked." Dr. Mark was

aware of VBHC, although H510 had not utilized VBHC as a strategy at the time of this study.

Findings from Case H750

Case H750 consisted of three interviews - Luke the laboratory administrative director;

Dr. Lem the PaLM medical director; and Larry the Ancillary Vice President. Interviews were

uninterrupted and took place in each participant's respective office. Unique to H750 was the

outreach accounts set up by Luke, described as offering "an additional revenue stream and an

expanded market reach." Larry recognized the high quality associated with PaLM testing as a

downstream cost savings for patients.

H750 Communication.

Luke participated on several committees to receive and share information. Luke

submitted PaLM data to the hospital quality department, the infection control committee, and the

emergency department committee. Dr. Lem participated quarterly on "interdepartmental

structures where administration and pathology communicate with each other…" Dr. Lem stated

that hospital administrators determined which committees he should attend. Luke pointed out

that hospital administration determined if a new laboratory service or assay was needed based on

feedback from "senior leaders and doctors who speak at Med-Exec committee." Dr. Lem

acknowledged his participation on the hospital's medical executive committee.

Luke's primary form of communication with senior leadership was via e-mails. Luke

said, "some senior leaders do come to the laboratory quite often to see the bench work and speak

to the techs." Luke felt it important to clarify that "the laboratory does hear a lot of support from

hospital administration." Luke said, "I want to brag on my senior leadership because they are

very supportive", adding "My staff know who they are, they say hello in the hallways, and they

know our names, which I think this is really important." However, issues on VBA

communication and feedback were identified at H750.

H750 VBAs.

Luke identified many PaLM VBAs, including a laboratory outreach that he set up after

seeking input from hospital administrators. Small (2016) recognized that hospital administrators

were unconvinced of the value in a hospital-based laboratory outreach. Shrinkman (2016), on the

other hand, stated that "a successful hospital laboratory outreach could furnish more than half of

a hospital's pre-tax earnings while accounting for less than 10 percent of its overall cost." Luke

had developed contracts with clients, established a fee schedule, and implemented processes for

reporting results and issuing client bills. While Luke had not determined the actual revenue from

this outreach project, he felt value had been provided to the hospital in terms of new patients and

satisfied physician partners. Luke identified pre-analytical VBAs including employee training

and monitoring of customer service skills, handwashing protocols, and AIDET. Luke recognized

the value associated with safety protocols, patient identification, and bedside labeling. Luke

noted the post-analytic value associated with calling of critical values and the information

displayed with test result for patients and providers.

Dr. Lem recognized PaLM expertise and utilization efforts as value-adding. Dr. Lem said

that the clinical expertise of the laboratorians was a necessity for improving blood product

wastage and for educating providers. Larry recognized the value associated with competent

laboratory staff performing high-quality testing, emphasizing the value of cost avoidance and an

improved length of stay. Larry offered an example of how the laboratory accurately and quickly

identifies catheter-associated urinary tract infections, which "impact hospital quality and length

of stay, tying into our hospital's profitability."

H750 VBA Alignment.

When asked about how the laboratory's services align with hospital goals, Larry emphasized that quality alignment *is* the hospital goal. Larry said, "It is about the right patient, getting the right treatment, and the right antibiotics, at the right time." When speaking of PaLM's analytical quality, Larry noted "the laboratory has things they report…and it rolls up into the quality meeting for the hospital." Larry was uncertain about other PaLM VBAs, stating that the laboratory, "does a good job, I guess…I think that we get what we need from the laboratory, so the laboratory must do a good job." Larry clarified that he was unaware of laboratory examples "that directly affects a value-based topic" other than quality. Larry had not heard of VBHC as a strategy.

Findings from Case H302

Case H302 consisted of two interviews – one with Terry, a laboratory administrative director, and another with Tracy, a hospital executive officer. Tracy said that "the primary interface for laboratory tends to be the laboratory administrative director." Terry agreed, adding that the ancillary VP communicated with "finance, revenue, and the CMIO." The H302 hospital system had separated the governance of laboratory services, laboratory informatics, and laboratory revenue and finance from the rest of hospital system

H302 Communication.

Terry noted that the laboratory "works very directly, hand-in-hand with the Risk and Quality departments." Terry purposefully placed employees from the laboratory on hospital committees "to share the data for reporting to Medicare." Terry offered an example of the laboratory reporting on the adherence of bedside patient identification and labeling, and data on compliance with sepsis protocols. H302 PaLM employees regularly attended interdisciplinary

meetings. Tracy noted that laboratorians responded with specific data when asked by hospital administration. Terry said his laboratory "most recently offered information related to labor and delivery and Covid infections." Terry communicated with hospital executives via e-mail and recalled an e-mail response stating, "as usual I agree with your recommendations."

H302 VBAs.

Terry felt that systemwide reporting structures and processes were in flux at the time of his interview. Terry participated in a system-wide laboratory collaborative with RFPs which "resulted in a million dollars a year in operational cost savings." Terry spoke of other systemwide collaborations that resulted in new equipment, automation, and operational workflow improvements. Terry stated a laboratory goal was to improve value by "inventory optimization and combined purchasing power" with system integration efforts.

Terry identified laboratory test results as valuable to pharmacy in choosing medication therapies, Xray in performing contrast dye procedures, and infection control in opting for isolation precautions. Tracy identified the value associated with accurate and timely laboratory test results and the oversight of point of care testing. Tracy also identified the value associated with the laboratory's data reports shared with a variety of hospital groups. Terry saw value in the laboratorian's expertise participating on "hospital pharmacy and therapeutics committee. … and discussion groups related to things like quality metrics and blood utilization." Terry added that H302 laboratorians participated in data analysis for Medicare reportables by "pulling out numbers for turnaround times, positivity rates, and other metrics." Terry recognized value with test utilization efforts and in participation "on ordering pathway groups…playing a big role" in establishing order sets and offering clinical expertise. Terry ensured that PaLM employees were integral to hospital committees and clinical care teams, expressing that visibility and

multidisciplinary participation were essential for the future of medical laboratorians.

H302 VBA Alignment.

Tracy, when asked about the strategic objective of the health system, was "not sure that the ancillary service lines were directly involved with strategic objectives." Her perception was that "the services lines follow the lead of the decisions made at the executive level." Terry admitted to "waiting for administration to reach out" and at times "deploying other corporate groups to trigger needed conversations." Tracy acknowledged that the laboratory's performance metrics helped the organization achieve desirable status goals. Tracy said, "I would say that if the laboratory is providing accurate and timely information, then our hospital is more able to meet regulatory standards." Tracy offered examples of VBAs with the laboratory's informational prompts in computer systems intended to guide physicians toward the achievement of core measures. Terry felt that PaLM services helped other departments like the ICU and the emergency room to meet their goals.

Themes Discovered

I assigned code labels to the texts of the interview transcripts, then organized codes into themes (Creswell & Poth, 2018). The NVivo software application aided in the coding and organization of the data. Creswell and Poth (2018) recognized that counting references and codes was a contentious matter since "not all qualitative researchers feel comfortable counting and reporting" (p. 192). However, the NVivo application automatically performed the code counts, as seen in Figures 7, 8, and 9. The column labeled *files* represents the nine interviews, and the reference column represents the number of times a code appears in the transcripts. Seven forms of communication emerged, as well as issues with communication (see Figure 7). Six types of PaLM VBAs were categorized based on the mVCM conceptual framework. The theme of PaLM

VBA strategic alignment developed from the responses of hospital administrators, assessments

utilized for PaLM services, and strategic goals identified of hospitals. The findings from each

case were analyzed, along with a broader cross-case analysis.

Interpretation of Themes

The typical format for a multi-case study is to present a detailed description of each case

followed by a cross-case analysis of identified themes (Creswell & Poth, 2018). Themes of

communication developed from the methods utilized by PaLM leaders to communicate with

hospital administrators. Themes of PaLM VBAs developed from the responses of hospital

administrators and laboratory leaders that identified PaLM services. The theme of alignment

with hospital goals developed from coding the feedback offered by hospital administrators,

assessments utilized for PaLM services, and identification of hospital strategic goals.

PaLM communication themes encompassed the ways in which PaLM leaders communicate

VBAs, the issues identified with communication, and the channels used for sharing information

(see Figure 7, 10). Communication from PaLM leaders occurred in a variety of formats including

verbal or written reporting, data analysis, e-mails, texts, and presentations. PaLM leaders

communicated VBAs with quality metrics, data reports, data on system dashboards, and

presentations at meetings.

Figure 7.

NVivo Database, Communication Files and References Frequency

Name	Files	References
Communication Issues identified	0	0
Communication Barriers	9	16
Communication culture	2	5
Communication Lacking	9	18
Communication of Quality	5	12
Communication with data	2	3
Communication with email or text	4	6
Communication with primary interface	8	11
Communication with demonstrations	3	3
Communication within hospital systems	4	6
Communication within meeting attendance	7	23

Themes of PaLM VBAs developed from coding the value attributes of activities within the interview texts. The mVCM conceptual framework (see Section 1, Fig. 2) guided the identification of the VBAs. Themes of PaLM value included competitiveness, cost improvement, customer service, effectiveness, efficiency, and quality (see Section 2, Fig. 8 & 11). As noted by Carman et al. (2014) many activities offered more than one type of value. Thus, VBAs were first categorized based on the value described by the participants, then aligned with the literature. The identified PaLM activities that impacted cost improvements included efforts to cut costs, avoid costs, and contain costs. Themes of customer service were derived from coding the activities that impacted the patient experience and physician satisfaction. Activities improving effectiveness included the optimization of resources and utilization efforts. Efficiencies were derived from multi-disciplinary actions, standardization efforts, turnaround time optimization, and technologies and testing platforms. VBAs associated with quality and performance

improvements were identified in the pre-analytic, analytic, and post-analytic phases, and

included expert consultations and data analytics.

Figure 8.

NVivo database, VBA Codes File and References Frequency

Codes		
Name	Files	References
Competitiveness	0	0
Core Competency & skills development	7	11
Costs	0	0
Test Cost Improvement	4	5
Test Insourcing Decision	3	6
Test Outsourcing Decision	3	7
VBA Cost Avoidance in Healthcare	4	8
Customer Service	0	0
Patient Experience	2	5
Physician Satisfaction	3	5
Effectiveness	0	0
Resource optimization	3	3
VBA Test Utilization	6	14
Efficiency	0	0
Intradisciplinary Actions	5	21
Standardization	4	4
TAT Optimization	6	20
Technology	4	6
Test platform evaluations	5	11
Quality	0	0
Analytic Quality	4	5
PostAnalytic Quality	2	4
PreAnalytic Quality	3	5
VBA Clinical Consultation	2	3
VBA Data Analytics	2	10

The theme of VBA alignment with hospital goals developed from the coding of feedback

from hospital administrators, identification of hospital strategic goals, and assessments utilized

for PaLM services (see Figure 9). Interview questions 1, 2, 7, and 17 were the primary source of information on alignment with hospital goals.

Figure 9.

NVivo Database, Hospital Goals Alignment, Files and References Frequency

○ Alignment with Hospital Goals	0	0
○ Feedback from Hospital Administration	6	10
○ Hospital Goals	8	14
○ PaLM Assessments	7	13

Representation and Visualization of Data

Multiple exposures to transcript data were essential for data immersion (Thomas, 2006). Audio recorded interviews were transcribed which required listening to the audio recordings repeatedly for accuracy. The transcription process increased familiarity with the raw data, aiding in the identification of connections or themes for coding. The coding was based on repeating concepts or phrases, using an inductive approach. The findings developed by categorial aggregation; a form of data analysis discussed by Stake (1995) where collections of instances form relevant meanings.

The categories for PaLM communication efforts are displayed in Figure 10. PaLM VBAs are displayed in Figure 11. Themes of VBA alignment with hospital strategic goals are displayed in Figure 12. Creswell and Poth (2018) note that researchers typically develop 25-30 tentative codes. Three distinct themes emerged from this study.
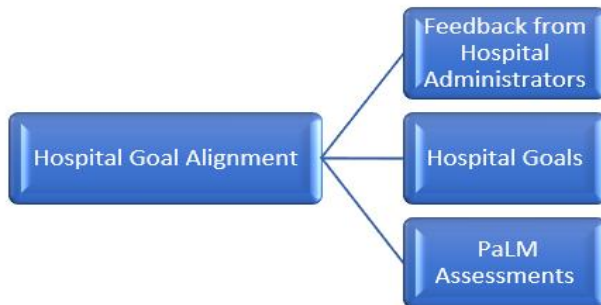
Figure 10.

Themes of PaLM Communication

Figure 11.

Themes of VBA

Figure 12.

Themes of PaLM VBA Alignment with Hospital Goals

Relationship of the Findings

Data collection relied on participant responses to interview questions; however, the unit

of analysis was the collective data from all cases with the conclusions based on multiple

perspectives (Yin, 2018). Thematic analysis examines differing perspectives, highlighting the

similarities and differences, generating unanticipated insights (Braun & Clarke, 2006; Creswell

& Poth, 2018) for naturalistic generalizations applicable to the population (Yin, 2014). The main

activity analyzing the cross-case data involved applying the findings back to the original research

questions (Stake, 2006). The intensive analysis of themes and subthemes led to the development

of assertations and generalizations, that when cross-referenced against the multiple data sources

from the literature, tested for *trueness* of the findings (Silverman, 2017). A summary of

anticipated versus the actual research findings are listed in Table 8.

Relationship to the Research Questions

RQ1. What value-based cost savings opportunities have laboratory leaders presented to

hospital administrators? PaLM leaders presented to system level leaders' information on

successfully negotiated RFPs for new testing platforms, automation, and standardizations which

had resulted in significant operational cost savings. PaLM leaders knew of other potential cost

savings relative to improvements in blood product and test utilization, testing algorithms, and

reference test gatekeeping. Details of these cost savings had not been presented by laboratorians

to hospital administrators due to a lack of time and knowledge on how to present, and conflict

avoidance. Dr. Lem felt that "conversations regarding physician's want versus costs…" were

associated with risks and at times a conflict of interests.

H302 and H510 hospital administrators expressed that PaLM leaders were not

forthcoming with cost savings initiatives and laboratorians tended to offer only the information

requested. While one hospital executive expressed that financial savings or "cost avoidance

reports would be nice," laboratorians stated they were not specifically asked to provide cost

savings information. Laboratory leaders felt that demonstrations of cost savings were too

difficult due to a lack of access to per unit cost information, a lack of time necessary to put

together a financial presentation, and the need to avoid conflicts of interests.

RQ2. What value-based opportunities are perceived as effectively communicated by

laboratory leaders to hospital administrators? Hospital administrators had difficulty identifying

any PaLM VBAs other than high-quality test results, productivity, and performance data. Two

hospital administrators noted a reliance on physician satisfaction surveys to measure PaLM

services. The H510 hospital executive said, "If the physicians believe that PaLM provides a good

service with timely and accurate results, then the (survey) score will be high. The higher the

score, the more likely we are to know that the physicians will make the hospital a place to

practice."

Hospital administrators perceived value in PaLM's accurate and timely test results, which

the H750 hospital administrator described as "improving patient care, helping patients to get well

sooner and go home sooner." The H510 hospital administrator noted assessing the laboratory's

productivity, a measure of ancillary performance recognized by Bergeron (2017). Although, as

Wilson (2014) pointed out, productivity as a performance measure fails to capture the

unreimbursed value contributions. Nordin and Kork (2017) suggested that the more appropriate

indicators to measure performance were organizational learning and value gained.

The H302 and H750 hospital administrators expressed that the laboratory's cumulative

data helped the hospital meet reportable measures and accreditation goals. The M510 hospital

administrator remarked that after attending a laboratory stewardship meeting, he learned that "a

lot of physicians over order lab tests" and interventions could improve utilization. Terry had

presented to H302 hospital executives his laboratory's efforts to streamline services across the

health system. Dr. Mark knew that such efforts improved value with economies of scale savings

for maintenance, contracts, and testing supplies.

H510 and H302 laboratory leaders recognized the laboratory's participation on hospital

committees was essential. However, PaLM leaders also noted that hospital administrators did not

typically attend interdisciplinary hospital meetings where the laboratory's information was

reported. All PaLM medical directors noted attending medical staff committees as requested by

hospital administrators. The H642 PaLM medical director mentioned offering a focused annual

report on pathology services as stipulated in her contract.

RQ3. How do hospital-based laboratory leaders communicate PaLM VBAs to hospital

administrators? Laboratory directors verbally reported at monthly meetings with a *one-up* in

hospital administration. PaLM medical directors participated in medical staff forums which were

attended by hospital administrators. Laboratorians participated on committees and hospital

events communicating testing data, order volumes, and turnaround times at various forums.

Laboratory leaders communicated regularly with hospital physicians and department managers

on patient's clinical testing needs. Laboratory administrative directors communicated capital

expenditure needs to the chief financial officer. Hospital administrators with access to system

level dashboards could see PaLM's reportable performance data.

RQ4. What PaLM VBAs do administrators perceive as aligning with value-based

objectives? The results of this study cannot confirm alignment with VBHC strategies. The H302

hospital administrator said that ancillary service lines were not directly involved with strategic

objectives. However, due to the soft descriptives of value (Kirkpatrick et al., 2015), many VBAs

were identifiable from participant interviews, some of which aligned with hospital accreditation

and status goals.

Hospital administrators assessed PaLM services based on satisfaction surveys. H510 and

H750 laboratory directors noted that a clean safe environment with skilled and courteous

phlebotomists improved patient satisfaction. H510 laboratory leaders identified that pre-

admission and pre-employment laboratory testing improved hospital workplace safety. Hospital

administrators generally recognized as desirable the laboratory test result and analysis of results.

Tinker (2018) and Tierney (2017) also recognized these attributes as value adding. However,

hospital administrators did not identify PaLM VBAs as aligning with a VBHC strategy or cost

savings.

Table 8.

R*esearch Questions, Findings, and Insights*

Research Questions	Anticipated Findings	Actual findings	Insights
RQ1. What value-based cost savings opportunities has the laboratory leadership presented to hospital administrators?	PaLM leaders fail to present cost savings opportunities to hospital administrators.	PaLM leaders presented opportunities to hospital administrators when negotiating system level contracts. Texas hospital administrators had not implemented VBHC strategies and had not requested PaLM leaders to present cost savings opportunities.	Defining cost savings takes on many forms including cost avoidance, operational cost savings, cost containment, and cost effectiveness. Demonstrating cost savings in healthcare presents challenges due to the lack of access to information, a clear way to demonstrate cost, and the time report. Cost savings, cost avoidance, and cost effectiveness demonstrations were not requested by nor presented to hospital administrators.
RQ2. What value-based opportunities are perceived as effectively communicated by PaLM leaders to hospital administrators?	Hospital administrators are unaware of PaLM VBAs. PaLM leaders fail to effectively communicate VBAs.	Hospital administrators identified value with high-quality, accurate, and timely PaLM test results. Value was perceived in productive FTEs as a form of cost containment. Value was perceived in the efforts to improve patient and physician satisfaction.	Texas healthcare administrators had not requested value-based information from PaLM leaders at the time of this study. Hospital administrators perceived the laboratory's quality, volume of testing, and rapid turnaround time as valuable. Hospital administrators participating on system level stewardship meetings heard about other types of laboratory value-based opportunities such as utilization and cost avoidance.

RQ3. How do hospital-based laboratory leaders communicate Palm VBAs to hospital administrators?	PaLM leaders fail to communicate PaLM VBAs to hospital administrators.	PaLM leaders report as requested by hospital leaders. PaLM leaders reported performance data to quality committees and dashboards; attended multidisciplinary meetings; shared requested information via e-mail, text, written reports; provided department tours; and communicated verbally with physicians and nurses.	E-mail was the most frequently used form of communication and PaLM leaders shared information while attending multidisciplinary meetings. Barriers to communicating cost savings and cost avoidance included a lack of access to per unit cost, a lack of knowledge on how to present cost avoidance, and a lack of time. Other identified communication barriers included adequate information, organizational layers, perceptions of insignificance, a desire to avoid of conflicts, and a culture of sharing only what is requested. PaLM leaders acknowledged that information not requested was not offered.
RQ4. What PaLM VBAs do hospital administrators perceive as aligning with value-based objectives?	Customer service and efficient turn-around times align with value-based pursuits.	VBHC strategies were not implemented in Texas hospitals. Assessments of PaLM services were based on survey responses and productivity measures.	Participants failed to recognize the full value chain of PaLM services. Cost improvements were not an objective for laboratories. Value optimizations using PaLM's expertise were identified within test algorithms, testing platform evaluations, & sourcing decisions.

Relationship to the Conceptual Framework and Anticipated Themes

The primary conceptual framework by Robbins et al. (1994) offers simplistic structure for message transference (see Fig. 1). The sender of PaLM's value message was identified as the primary laboratory interface to hospital administration. The hospital administrator's primary interface for the laboratory was the laboratory administrative director and/or medical director. No cases utilized a DCLS at the time of this research. The message analyzed was PaLM VBAs and the receiver of information was the hospital administrator. Guo (2011) pointed out that effective communication more likely occurs with feedback as a reaction to the message, which permits an opportunity for clarification. Without feedback, one-way communication from the

sender is less accurate, and the sender cannot know the message was received or accurately

understood (Gardner & Winder, 1998). While the H750 medical director felt the laboratory

"received feedback, in terms of the hospital goals set for the department", other feedback on

PaLM VBAs had not been recognized by hospital administrators. Dr. Mick said that the primary

source for feedback was from the physician satisfaction surveys. Mary said, "I'm not sure that

we've gotten a lot of feedback from administration about our activities. It would have been nice

to have some recognition…" PaLM leaders identified the barriers to communication as

organizational layers, lack of adequate information, conflicts of interest, perceptions of

information or sender insignificance, conflicting priorities, lack of time, and a culture of sharing

only requested information.

A secondary conceptual framework on value in service delivery and support activities

combined the concepts of Porter (1985), Swayne et al. (2006), and Carman et al. (2014) as a

strategic thinking map. Swayne et al. (2006) purported that value increases when primary

production activities improve efficiency and effectiveness, quality, safety, satisfaction, and costs.

Porter (1985) and Burns et al. (2001) suggested that value also enhances from the support

activities that improve an organization's culture, structure, and strategic resources, i.e.,

improvements regulatory compliance, culture, skills development, and partnerships. Similarly,

Medicare's Hospital Value Based Payment program (Centers, 2019c) incentivizes improvements

in safety, patient outcomes, engagement, efficiencies, and cost reductions.

The PaLM value adding themes emerged from this study within the service delivery and

environmental support tracks, aligning with the mVCM conceptual framework (see Table 9).

While interview questions were not specifically designed for the identification and classification

of PaLM VBAs, themes did emerge for competitiveness, cost improvement, customer service,

efficiency, effectiveness, optimization of technology, and quality. Many PaLM VBAs overlapped in value attributes. Some mVCM concepts were not overtly apparent, i.e., PaLM VBAs improving cultural support, collaborative partnerships, and regulatory compliance, merely because this study was not designed as an in-depth analysis of PaLM's value chain. Interview questions were not designed to explore all the value endeavors within PaLM's entire value creating ecosystem and the identified PaLM customers in this study included only the patients and hospital care providers.

Table 9.

mVCM Conceptual Framework and VBA Themes Alignment

Activities that improve value	mVCM Conceptual Framework	PaLM VBA themes identified in this study
Skills Development	Competitiveness – Core Competencies enhancement	Competitiveness – Core Competencies & Skills Development
n/a	Profitability / Cost Containment	Cost Improvement
Satisfaction	Customer service - Partnerships & Collaboration	Customer Service - Patient experience & Physician Satisfaction
Efficiency	Efficiency	Efficiency – Standardization, Optimization, & Technology
Effectiveness	Effectiveness	Effectiveness– Interdisciplinary Actions
Standardization	Standardization	Optimization / Technology
Quality	Quality / Safety	Quality
Technology	Technological Advancement	(See Optimization)
	Cultural support / policy and procedures and regulations	(See Effectiveness)

Relationship to the Literature

The findings were evaluated in relationship to the literature review from section 1. The findings were analyzed for similarities and differences with the literature. The information obtained from the PaLM leaders and hospital administrators was examined relative to strategic alignment, value classification, and communication efforts, including barriers and feedback.

PaLM Alignment with VBHC.

VBHC strategies contribute a structure for the identification and measurement of improvement needs (Kaplan et al., 2014). Optimal success in strategic alignment endeavors requires linking internal business unit activities with broader organizational objectives (Bryson, 2018; Gambel et al., 2019). Alignment at all levels of the organization delivers a better understanding, acceptance, and support of the value proposition (Austin et al., 2016).

This research did not confirm that VBHC strategies were selected for Texas acute care hospitals. Dr. Barb acknowledged that her facility was only in the beginning stages of VBHC planning. Dr. Mark said that "Texas hospitals have been slow to adopt a value-based strategy." Larry had not heard of VBHC as a strategy for his facility. At the time of this study, however, Texas Health and Human Services had implemented a VBHC focus on the quality of care and holding providers accountable for the cost of care (Texas, 2021).

Marlow et al. (2016) noted that hospital CEOs typically focus on the patient experience, customers satisfaction, clinical quality, and costs. Hospital administrators also focus on safety, efficiency, personnel shortages, and cost reductions (ACHE, 2019; Green et al., 2018; Newman, 2018), as well as government mandates, accreditation requirements, and reportable measures (Tinker, 2018; Tierney, 2017). Collectively these numerous goals improve value, despite any ambiguity in the reporting of value-based outcomes (Porter, Larsson, & Lee, 2016).

Sarwar et al. (2015) noted that metrics allow leadership to determine the degree of adherence to organizational goals. The PaLM metrics identified in this study were relative to organizational performance goals, quality efforts, and satisfaction survey scores. H302 Terry said that PaLM contributed data for a variety of hospital status recognitions, which Tracy confirmed included Joint Commission accreditation, Magnet Status, LeapFrog status, and Primary Stroke

Center designation status. Tinker (2018) and Tierney (2017) remarked that accreditation requirements, government mandates, and financial incentives determine which reportable measures were chosen by hospital leadership. Tracy and Larry acknowledged that PaLM's performance metrics helped the organization to achieve desired status goals.

Wagar et al (2019) noted that laboratorians were data driven. Laboratorians communicate well with quality metrics (Bergeron, 2017; Bixho & Melanson, 2017). Sarwar et al. (2015) and Schmidt and Ashwood (2015) recognized that laboratories used performance indicators for many things, including finance, productivity, regulatory compliance, and processes such as analytical performance, turnaround times, down times, wait times, or staffing efficiency. Sarwar et al. (2015) said that leaders utilized these types of metrics to assess, manage, and respond. H510 Mary said that she reported laboratory quality and performance improvement measures on a system operational dashboard. Visible performance metrics roll-up into system dashboards (Green et al., 2018), revealing the opportunities for team collaboration (Gupta et al., 2019). H510 Dr. Mick noted that laboratory metrics could reveal a need for a change in a process or the need for new equipment. Ducatman et al. (2018) recognized that laboratory dashboards effectively monitor, communicate, and educate. H750 Larry noted that laboratory quality measures were viewed on system-level dashboards. H750 Luke discussed monitoring laboratory dashboard metrics for workflows and efficiencies. Assessments of internal performances aid in the identification corrective adjustments needed (Gambel et al., 2019). Passiment and Linscott (2014) point out that unmeasured or unverbalized outcomes lead to many projects going unnoticed.

PaLM Value Chain (VBAs).

Kirpatrick et al. (2015) defined value with *soft* descriptives such as effectiveness, efficiency, safety, and satisfaction. Davis et al. (2018) described value as the clinical care process improvements in efficiency, patient experience, outcomes, and cost reductions that affect Medicare reimbursements. Kim et al. (2012) recognized quality enhancements as value improving. Together, these healthcare related value attributes make up the categories of a value chain. VBAs emerging from the coded interview transcripts were categorized into themes using the mVCM framework as guidance (see Table 9). These included six value improvements, e.g., competitiveness, customer service, efficiency, effectiveness, quality, and costs (see Fig. 8)

PaLM Competitiveness – Core Competencies, Skills Development.

Value enhancements improve strategic resources and core competencies, i.e., internal skills, capabilities, and technologies (Fottler, Ford, & Heaton, 2002; Kratz & Laposata, 2002; Swayne et al., 2006). Gambel et al. (2019) noted that internal resources and capabilities require development and nurturing for a sustained competitive advantage. This study found no evidence of Texas hospitals supporting the internal strengthening of laboratorians. Yet, hospital laboratorians with clinical expertise and adequate skill sets (University of Kansas, 2019; Wagar et al., 2019) were identified as educating others. Terry identified the importance of laboratorians "participating on most hospital committees." Terry said, "Our lab leadership felt strongly that the laboratory needed to be represented at the table. We know that laboratorians are often invisible, but by our participation on committees…we bring back information to the laboratory for ways we can help. If our laboratorians did not attend these committees, important information would be missed."

Ahmed (2019) pointed out that higher-level directors tend not see the value insights from lower-level employees. Luke bragged on his "senior leadership because they are very supportive of the laboratory… My staff know who they are, say hello in the hallway, and they know our names." Mary identified a major issue as a lack of laboratory employee retention and wage equivalence. Mary and Luke mentioned that employee retention was an evaluation goal for laboratory leaders. CCCLW (2018) and ASCLS (2018) noted that laboratory's retention issues required professional visibility, workforce appreciation, and wage equivalency with similarly educated professions.

Gross et al. (2019) noted that strong laboratory leadership is a necessity to highlight the laboratory as a core asset and to communicate the laboratory's value to healthcare administrators. Strong leaders require an understanding of the factors affecting employees, as well as their employees' contributions to good hospital citizenship (Glavas & Goodwin, 2013; Henderson-Carter, 2014). The concept of hospital citizenship, also discussed by Boland et al. (2017), refers to the roles and responsibilities of *all* staff contributing to improving patient care. A laboratory's people assets contribute the high-quality work necessary for the diagnosis, prognosis, treatment, and management of human disease (Anonychuk et al., 2012; Davis et al., 2018). Dr. Barb recognized that her "well-trained team of phlebotomists with a competitive ratio reporting" as "very focused on supporting the mission of the hospital." Dr. Barb also recognized that adding a blood bank specialist enhanced the hospital's core competencies. Stroh (2015) pointed out that ideally, the entire organization keeps a watchful eye on opportunities, risks, and trends. Dr. Lem spoke of the importance of the "blood bank supervisor attending meetings: that are inter-departmental and identified the importance of the laboratory's clinical expertise in "gatekeeping test orders, improving blood product wastage, and educating providers."

Laboratorians offer an intangible asset. Kaplan and Norton (2004) pointed out that highly educated and competent staff are an intangible resource, difficult for competitors to imitate and offering a sustainable competitive advantage. Swayne et al. (2006) warned that such intangible resources should not be underestimated.

PaLM Customer Service – Provider Satisfaction and Patient Experience.

Fottler et al. (2002) recognized that benchmarking service quality and customer value depends on the customer's perspective. PaLM customers in this study were identified as the patient and care providers. Surveys ranked phlebotomy services and the physician satisfaction of laboratory services at H642, H510, and H750 as a condition of CAP accreditation (CAP, 2014). Mary at H510 said that a 3rd party surveyed staff physicians annually. Dr. Mick said that surveys were "sent out for anonymous response… with a variety of questions to be rated on a scale of 1 to 5, or poor, fair, good, satisfactory, excellent, etc." Dr. Mark said that "If the physicians believe that the laboratory provides a good service with timely and accurate results, then scores will be high. The higher the score, the more likely we are to know that the physicians will make our hospital a place to practice." Generally, as McCall (2016) and Jones et al. (2009) noted, providers are satisfied with the quality and reliability of laboratory testing, the courtesy of the laboratory staff, and the adequacy of test order menus. H750 hospital administrator Terry said that hospital surveys found that the laboratory added value to patient care by "ensuring that our test results are accurate and timely." Inal et al. (2016) noted the value associated with accurate and timely laboratory test results to healthcare providers.

A key aspect in any value-proposition takes into consideration the stakeholder's needs and expectations (Price et al., 2016). Tracy remarked that meeting Medicare's quality star rating required ancillary services to "understand strategic decisions from the needs of the customer, our

patient's perspective." A hospital's value is defined by Medicare in Quality Star ratings (Centers,

2021). Passiment and Linscott (2014) noted that patients appreciate easily retrievable test results.

Luke spoke of improving the patient experience with online access in real time to laboratory test

results and identified patient satisfaction stating, "patients have access to their test results and

know what questions to ask before the provider arrives". Luke said, "We encourage patients to

use the portal and we tell them the results will be available in a few hours. It is usually pretty

quick and saves a lot of phone calls." Luke identified the interfacing of laboratory results to an

online portal as a VBA that improves satisfaction and efficiency.

Nilsson et al. (2017) recognized the multiple understandings of value exist for the patient.

Larry discussed the patient laboratory experience in terms of quality. Larry tied laboratory

quality to profitability, citing laboratory high-quality testing aids "patients in getting the right

treatment, getting well sooner, and going home sooner." Karuppan et al. (2016) recognized that

patients desire convenient service locations with limited wait times. Mary remarked that the

H510 outpatient satisfaction surveys were good and said that patients appreciated the

convenience of the draw station inside the hospital. Mary spoke of defending the outpatient

phlebotomy location as an advocacy for the patients. Luke described an aesthetic overhaul of the

outpatient phlebotomy area as necessary to improve the patient's experience. Luke said, "I think

we've really brought value to the hospital by doing improvements in that [phlebotomy] area."

Koh et al. (2014) stated that some patient surveys reveal a dissatisfaction with specimen

collections and phlebotomy services. While participants did not directly discuss the patient's

venipuncture experience, Luke described value to the patient with the preanalytical quality that

ensured by "AIDET, patient safety, and hand hygiene embedded in our employee training."

PaLM Efficiency - Process Improvements, Turnaround Times, & Standardizations

Sustainable cost reductions require the identification and modification of inefficient and ineffective processes (Porter et al., 2017). Dr. Barb identified a process improvement relative to HIV screening and confirmatory testing. Dr. Barb's efforts to standardize resulted in patients experiencing less delays and appropriate treatment. Karuppan et al. (2016) recognized that internal activities are part of the larger processes, needing to be designed and managed for optimal value delivery. Mary's laboratory had streamlined and consolidated testing, implementing new equipment and adding autoverification of test results, which improved turnaround times and subsequently the emergency room's throughput. Mary also implemented process changes to help her staff visually recognize and prioritize "STAT specimens from the emergency room patients." Likewise, Dr. Mick recognized the need for a process change that prioritized "stroke patient testing over all other routine or random test orders." Schmidt et al. (2016) and Worster et al. (2017) recognized that efficient laboratories utilize a managerial focus on projects that improve processes, time, and complications.

Swayne et al. (2006) recognized that standardizations add value. Dr. Mark recognized value as associated with "standardizing and streamlining services so that everyone across the system uses the same measures and equipment". Standardizations within the supply chain, according to Dr. Mark, add value "with an economy of scale in the purchase of maintenance contracts and testing supplies." Similarly, Terry noted that standardizations of systemwide RFP processes had resulted in major technology upgrades with significant cost savings.

Standardizations leads to improvements in quality (Green et al., 2018). Terry noted that systems integrations and order set standardizations improved quality. Luke identified standardization with bedside patient identification and labeling, a quality process required by the

Joint Commission. Batalden and Davidoff (2007) recognized that some standardizations require measurement to enforce compliance. Larry recognized that the laboratory's "hardwiring processes and continual monitoring" shortened the patient's length of stay in the emergency room.

Efficient organizations adopt best practices (Srivastava & Sushil, 2018). Laboratory autoverification, recognized by Krintus et al. (2017) as a best practice, was implemented at H510. Dr. Mick and Mary noted that autoverification had replaced the manual release of test results and greatly improved processes and turnaround times. Luke was "looking into" how his laboratory might implement autoverification. Larry recognized that new equipment with interfaced results had eliminated the need for manual results entry. Larry said, "Consistently, we are looking to invest in better equipment that improves our turnaround times and makes it easier." Dr. Mick identified that relocating the pathology frozen section room to "just outside the operating room would reduce operating time for the patient…" Efficient organizations strive for continuous improvement to optimize outcomes (Hallworth et al., 2015).

All interviewed laboratory leaders mentioned reporting out measures for STAT turnaround times. Mary reported monthly STAT turnaround times at an emergency room meeting and on a system dashboard. Gambel et al. (2019) recognized the reporting of turnaround times was a best practice proven to communicate consistency. Hainen and Coberly (2018) identified STAT turnaround times as a visible performance measure. Dr. Mick knew that new instrumentation with a specimen track system had improved efficiency. Tracy stated that her organization purchased better equipment to improve STAT turnaround times. Mary spoke of an automated track system as a "hands free improvement, allowing technical staff to focus on critical thinking tasks." Larry recalled switching from laboratory testing to point-of-care testing

in the past but said that now "newer technology with instrument interfaces were outperforming

point of care devices." Turnaround times offer a measurement of efficient processes (Sarwar et

al., 2015).

PaLM Effectiveness – Utilization, Optimization, & Interdisciplinary Participation

ASCLS (2018) recognizes that medical laboratorians offer valuable expertise in test

selection and results interpretation, that reduces diagnostic error and avoids unnecessary testing.

Wilson (2015) and Lewandrowski et al. (2017) discussed that effectiveness of care was improved

with test order demand management approaches and test algorithms. Engaging laboratory leaders

can optimize organizational resources, identify improvement opportunities, and improve care

effectiveness

Utilization. Terry recognized value in the utilization dimension saying, "We play a big

role and nobody outside the laboratory puts that into play except us." Laboratory leadership

drives utilization improvements by analyzing data and communicating with physicians

(Lewandrowski et al., 2017). Dr. Lem described test utilization as a needs analysis ensuring "the

appropriate utilization of high-end testing". Noting healthcare's limited resources, Dr. Lem

added, "We have to make sure there is a clinical necessity to run that test since these state-of-the-

art tests are quite expensive. We want to make sure they are done for the appropriate reason." Dr.

Lem had "eliminated low-volume, high-cost tests" which he described as "a poor utilization of

resources." Dr. Mick had taken steps to remove tests from computer order sets to ensure the

appropriateness of test orders. Dr. Lem noted that effective utilization required identification of

"tests that are not warranted anymore or had fallen out of favor clinically." Standardizing order

menus and eliminating unnecessary testing was a project Dr. Lem described as highly effective

"especially in terms of batch testing and order sets, to make sure that physicians were ordering only the tests required and getting rid of tests that are not clinical useful."

Resource optimization. Healthcare administrators implementing VBHC strategies must carefully consider the specific internal strengthening actions and resource allocations necessary for success (Bryson, 2018). High performing organizations enable all stakeholders to engage in optimization and resource allocation decisions (Carmen et al., 2014). Luke saw an opportunity to optimize existing resources and enhance revenues by performing outreach testing. Larry recognized that a new laboratory analyzer with high throughput and rapid turnaround times was optimal over "the expensive point of care testing platforms used by nursing." Mary participated in resource optimization efforts "by combining purchasing power with sister laboratories" for significant cost savings.

Raebel et al. (2019) pointed out that PaLM expertise is instrumental in the identification, prioritization, and selection of improvement initiatives. Dr. Barb and Terry recognized the laboratory's informational prompts on electronic test orders and helpful comments on test results reinforced transfusion guidelines and stroke measures. Terry offered the example: "If the hospital stroke measures state a targeted goal for LDL is less than 100, or if best practice for transfusing is only when hemoglobin is less than 7, the [laboratory] informational prompts help our organization meet these goals."

Interdisciplinary Participation. Laboratorians demonstrate clinical expertise participating on multidisciplinary teams (IOM, 2015; Wagar, Eltoum, & Cohen, 2019). Aldeman (2012) and Wagar et al. (2019) recognized the value of laboratory leaders interfacing with other healthcare professionals and communicating cross-functionally in hospitals. Dr. Barb recognized the value of her clinical expertise during the Covid pandemic as she participated in daily and

weekly interdisciplinary meetings. Mary reported Covid testing results information daily during multidisciplinary incident command calls. Medical technologists at H510 and H750 presented convalescent plasma education. Wagar (2019) recognized the importance of laboratorians liaising with physicians and nurses. Nilsson et al. (2018) recognized that interdisciplinary meetings improve organizational knowledge.

Dr. Mick described "presenting information to committees or… discussing cases at grand rounds or tumor boards" as an "opportunity to educate others." Terry, noting PharmD's integration with clinical care teams, commented that "The laboratory may not be doing integration at the nursing floor level yet, but we are doing it [integrating] at the hospital infrastructure level, within IT, quality, and finance. We' re getting out there, into all of these various settings." Laboratory professionals add value in healthcare as clinical consultants, sharing clinical expertise on care teams, tumor boards, infection prevention committees, clinical utilization and antibiotic stewardship committees, performance improvement teams, and transfusion management programs (CCCLW, 2016; COLA, 2015; Davis et al., 2018; Morgan et al., 2017).

Terry shared that multidisciplinary meeting attendance allowed laboratory leaders to bring back valuable information "to laboratory leadership who can help determine the feasibility of requests." McFadden (2014) noted that organizational operations were refined and updated with the dissemination of knowledge. "If our laboratory did not attend these committees, they would miss important information. For instance, if the ER has a goal of 1 hour for results, the laboratory can help meet that goal," said Terry. Likewise, Mary recognized the importance of multidisciplinary meeting attendance for educating and sharing change information. Terry was hopeful that hospital administration would say "how can we survive without laboratorians being

part of the team?" Terry sought to "lock the laboratory in place at different levels of the organization." Such visibility, supportive efforts, consultation, and information sharing improves value and recognition (COLA, 2015).

PaLM Quality – Specimen Phases, Safety, & Data

Hawkins (2012) stated that the analytical dimension of laboratories was the best performing sector of healthcare. Price and St. John (2014) identified the value associated with the laboratory test as the information communicated from the result. The "laboratory data is an integral part of patient care decisions throughout the hospital," said Terry who offered examples of assisting pharmacy in medication therapy options, Xray in contrast dye procedures, and infection control in isolation precaution needs. The ASCLS (2005) recognized that laboratory test results offered value for determining the effectiveness of nutritional and medical treatments, drug or cancer therapies, and optimal antibiotic therapies.

Hawkins (2012), MacMillan (2014), and Waibel et al. (2018) mentioned that quality and cost savings were associated with the extra-analytical phases of laboratory testing. Laboratory quality begins with specimen collection quality, described by Larry as "ensuring the right patient is getting the right treatment." Terry and Luke identified the laboratory's role in clinical procedures such as finger and heel sticks, venous and therapeutic phlebotomy, and nasopharyngeal specimen collections. Mary identified the laboratory's participation in bone marrow aspirations.

Luke had requested capital for bedside label printers as "a safety improvement project." Dr. Barb noted that customer service surveys with HCAHPS asked, "How is the courtesy of the person who drew your blood?" Luke recognized specialized teaching and the monitoring of "AIDET, handwashing, and labeling" as value adding. Dr. Barb also mentioned specialized

training in blood culture collections that improved the patient's quality of care. At Dr. Mick's

hospital, where nurses performed most specimen collections, the laboratory contributed value by

educating nurses on specimen collection timeliness, technique, and transport. Plebani & EFLM

(2017) noted that optimal analytical performance depends on the quality assurance of extra-

analytical phases.

       Palm Data. Laboratory test results provide the data necessary to improve healthcare's

utilization, quality, outcomes (Shirts et al., 2015), and costs (Xu et al., 2015). Dr. Mick identified

the importance of laboratorians analyzing and sharing test data information. Dr. Mick said, "We

attend a quality committee, where laboratory data is reviewed, and offer feedback … our data

goes to collaborative and the medical executive committee…or may be used in informal

meetings with physicians." Terry noted that data from the laboratory was reported to the

"quality management group, infection prevention group, and risk management group." Terry

acknowledged that "the laboratory controls an unbelievable amount of data" and "instead of just

knowing how to perform a glucose test, we know the answers to a million questions from our

data, relevant to the treatment of populations." Terry felt strongly that the laboratory must

"maintain its own laboratory informatics group, separate from the hospital informatics group...

because the laboratory is so complex that nobody, nobody except a laboratorian, will have the

answers to those questions." Downs and McMinn (2017) stressed that the value of laboratory

would become more transparent as health systems delve into population health. Medical

laboratorians have adequate skill sets and expertise for the management of population health

strategies (Swanson et al., 2018).

PaLM Cost Improvements –Sourcing, Cost per tests, and Cost Avoidance.

COLA (2015) pointed out that laboratory cost savings occur in the forms of cost effectiveness, cost containment, and operational efficiency. Cost effectiveness involves assessing competitiveness, pricing, and profitability (Downs & McMinn, 2017). Luke used his laboratory expertise to determine the best sourcing options for testing. Luke determined the potential profitability of an outreach market stating, "If we grew our outreach test revenue on a larger scale, we could potentially make a lot of money." Luke determined laboratory pricing and mark-up based on Medicare's laboratory fee schedule. Dr. Barb considered a different sourcing decision by assessing the cost effectiveness of insourcing Covid testing. Dr. Barb clarified that her decision had "reduced turnaround times in half… and the cost per test" by 62%. While Rogers et al. (2019) stated that outsourcing low volume tests may improve hospital laboratory costs, this study finds no direct evidence to support outsourcing as a cost-effective measure.

COLA (2015) noted that cost effectiveness requires improvements in operational efficiencies, quality, and per unit costs, guided by competent laboratory management (COLA, 2015). Passiment and Linscott (2014) stated that competent laboratory management was essential to identify cost improvement opportunities. Mary worked with system level laboratory directors to "determine how best to streamline services" and identify cost savings "on maintenance, contracts, and testing supplies". However, hospital administrators had not asked Mary to demonstrate her cost savings efforts. Lewandowski et al. (2017) recognized that laboratorians play a significant role in the investigation of testing methods and new tests. Terry had assessed contracts for laboratory equipment and supplies optimization that combined system purchasing power for significant operational cost savings. System level contractual relationships minimize costs (Harrison, Harrison, Howey, & Schwartz & Pearson, 2013).

Appropriate utilization improves the effectiveness of care, while demand management decreases direct and downstream costs of care (Lewandrowski et al., 2017; Wilson, 2015). Dr. Mick stated that the laboratory stewardship committee functioned to improve utilization and "the provision of value-based laboratory services and quality." Dr. Mark spoke of avoiding costs with the "judicious use of transfusions." Dr. Mick discussed a *C. difficile* test orders as inappropriate, i.e., without liquid stool or a history of antibiotics. "Good stewardship", said Dr. Mick, "required us to remove this test from the standard order set…avoiding the delay of results and the unnecessary testing." Laboratory stewardship, per Halstead and Sautter (2018) eliminates waste, and ensures the right tests are ordered for the right patient care. Dr. Mick felt that a laboratory stewardship committee sought "to deliver an entire value – or in other words an appropriate utilization, with quick turnaround, quality results, and cost savings."

Larry emphasized that the laboratory's high-quality assurance efforts avoided costs because "the quality of care and length of stay directly ties to the hospital's profitability." Larry clarified that "accurate information on blood cultures, urine cultures, and throat cultures, specifically determines the correct antibiotics necessary to treat the patient." Dr. Barb emphasized cost avoidance with a reduction in blood culture contamination rates. PaLM leaders expressed a lack of access to per unit cost information and the knowledge to present cost avoidance efforts.

The Hospital Administrator.

The executive level administrator, as the primary decision maker, owns the strategic formulation and planning responsibility, while lower-level employees implement activities and support customer service relationships (Davis et al., 2012). Tracy articulated this point when she said, "I'm not sure that the ancillary service lines are directly involved with the strategic

objectives of the health system. Rather these services lines follow the lead of the decisions made at the executive level." Tracy added that if hospital administration asked a specific question of laboratory leaders, then an answer would be provided. Terry corroborated that waiting "for administration to reach out" was common before offering information. Mary said, "The laboratory helps by providing what administration asks for." Adelman and Stokes (2012) noted that leaders who establish trust, build relationships, and remain visible encourage feedback from employees.

Texas hospital administrators utilized metrics to assess PaLM services for quality, turnaround times, and customer satisfaction. H710 and H510 hospital administrators evaluated PaLM services by physician and employee satisfaction. Mary's annual performance was graded on physician satisfaction, and employee engagement and retention measures. Concerning physician satisfaction, Dr. Mark said, "If the physicians believe that laboratory and pathology services provide a good service with timely and accurate results… they will be more likely to practice at this hospital." While uncertain how H642 hospital administrators analyzed PaLM performance, Dr. Barb concluded that "they recognize we have some opportunities." These opportunities were not elaborated. Texas hospital administrators did not use value-based performance measures for assessments – i.e., competitiveness, efficiency, effectiveness, and cost improvement. Nordi and Kork (2017) expressed that more appropriate measurables should be organizational learning and value gains.

Effective communication requires feedback, defined as the reaction to the message, which permits clarification (Guo, 2011). Feedback offered by Texas hospital administrators was limited to the customer satisfaction scores for laboratories. Feedback on other types of VBAs were not offered by hospital administrators. When asked about feedback from hospital

administration, Mary said, "What feedback have I gotten? From administration? I'm not sure that

I have gotten a lot of feedback from administration about our activities…I am not sure that there

were any kudos for the laboratory even during Covid. It's all about nursing."

Longenecker and Longenecker (2014) discussed that a lack of two-way communication

regarding improvement initiatives causes significant problems. An ASCP survey found that the

lack of appreciation was a dissatisfier among laboratorians (Garcia et al., 2019). Passiment and

Linscott (2014) wrote that "The mystery of the laboratory is perpetuated by the lack of an

organized, systematic, flexible, and bi-directional exchange of information, ideas, standards, and

beliefs between the laboratory and its customers, i.e., effective communication." (p.451).

PaLM's Messaging.

The laboratory's primary interface with hospital administrators was the laboratory

administrative director and the PaLM medical director. No DCLSs were identified in this study.

Wood (2016) noted that ideally the hospital-based pathologist plays a major proactive role in the

development of the laboratory's value proposition. Wagar et al. (2019) discussed the importance

of the hospital pathologist having excellent communication skills, interfacing outside the

laboratory, and being involved in clinical laboratory activities. However, Dr. Barb identified

inadequate "time for putting together reports" as a barrier in involvement and in demonstrating

the laboratory's VBAs. While success reports offer a powerful communication tool (Hartland,

2018), Hendricks et al. (2015) noted that most hospital pathologists already have a day job with

little time left to devote to outside of pathology reporting.

Lippi and Mattiuzzi (2019) pointed out that the laboratory manager establishes favorable

and constructive interfaces with hospital administrators. Passiment and Linscott (2014) felt that

laboratory management owned the responsibility for improving communication skills. Alder et

al. (2019) posited that education and training was necessary for reporting upward on improvement projects and departmental results. Successful initiatives require a communication plan that shares knowledge with the organization (Graber, 2017). Terry expressed that PaLM's value messaging should help hospital administrators "stop and think because they're really good people, but sometimes the (laboratory) message gets washed out." Information overload does hinder effective listening for the hospital administrator, resulting in the selective screening and discarding of information (Communication, 2016; Gardner & Winder, 1998).

Tracy noted the importance of having "a trusted relationship between hospital administration and ancillary directors." Establishing relationships builds rapport and improves credibility (Communication, 2016). Tracy discussed the laboratory's "credibility, accountability, and responsibility," a phrase also used by Terry. Effective communication requires a credibly perceived information source, competent communicators, and a clearly defined message (Gardner & Winder, 1998). Karuppan et al. (2016) noted that managers should communicate with the executives interested in their efforts, since details are better remembered by interested receivers.

PaLM's Communication Barriers.

Lord (n.d.) noted that improvements in communication are essential for the delivery of VBHC. While organizational charts define the intended communication channels (Passiment & Linscott, 2014), Tourih and Robson (2004) recognized that hierarchy inherently filters information. Terry said that "Organizational layers, with many differing cultural thought processes, present a challenge for delivering a cohesive message of value." Both Tracy and Terry recognized that organizational layers presented a challenge for effective communication. Tracy stated that another communication barrier "…could be that laboratory leaders lack an

understanding of the premise to our questions on improving value", adding that "questions about improving value tend to be thought of as cutting costs, suggesting a loss of funding, or FTE's." Guo (2011) warned that positions of status can affect messaging.

Communication on improvement activities demonstrates the efforts to transform operations (Fusch & Gillespie, 2012). When asked about the laboratory's value message, Dr. Mark said, "I do not think that laboratory overall does a great job of reporting their initiatives to the global c-suite." Dr. Mark wished "the laboratory could take one of its initiatives … add a cost avoidance measure over the past year with it and demonstrate savings." Dr. Mick knew that many laboratory VBAs "improved all three aspects of a value strategy - shortening time, providing quality care, and reducing the cost of care." However, when asked about sharing this information, Dr. Mick suggested this "might occur if we had time and could justify what the changes are doing." Dr. Mark, Dr. Mick, and Terry expressed that a lack of access to information was a barrier for laboratorians reporting. Terry identified the challenge of calculating per unit costs, while Dr. Barb was uncertain how to express cost avoidance.

PaLM's Communication of Value.

Laboratory leaders need an effective value-presentation message (Gross et al., 2019) and recognition of value is the critical first step (Misialek, 2014). Terry suggested that PaLM's value message needed to be presented as "a business case." Terry described his efforts with other system laboratory leaders in the negotiation of laboratory equipment contracts. Terry presented to system executives a new corporate purchasing agreement with projected savings, expected outcomes, and a six-month monitoring plan for actualized savings. Hospital administrators prefer such concise and relevant information (Communication, 2016). A well-performed public presentation tailored toward the executive level establishes credibility (Weinholdt, 2006).

Demonstrations with a certainty of the cost savings and effectiveness of improvements, help to gain political support (Øvretveit, 2009). Terry understood that credibility was important in his presentation. Terry said that hospital administrators were "approached many times in a day with false promises of better quality and monetary savings". Terry was aware that hospital executives are skeptical of bold savings solutions without details on the time, costs, and the necessary efforts (Øvretveit, 2009).

Touring hospital administrators around the laboratory offered laboratory leaders an opportunity for Show-and-Tell. Luke said that H750 hospital administrators visited his laboratory to see the work-in-progress. A finance executive at H510 visited Mary's laboratory to see the new specimen track system after implementation. Such Gemba walks improve a senior leader's accessibility to line-level employees and demonstrate their commitment (Protzman et al., 2015).

Multidisciplinary forums offer laboratorians a platform to present VBAs. Mary presented data on process improvements and quality at the hospital's quality meetings, although she noted that hospital administrators did not attend this type of meeting. Dr. Mick also recognized that hospital administrators rarely attend clinical meetings, and missed the information shared at clinical forums. Larry felt that since all hospital quality information rolled up into one large report for hospital administration, then hospital executives were aware of the laboratory's data presentations. Tracy noted that data from the laboratory was reported to "quality management, infection prevention, and risk management" committees. Terry added that laboratorians presented at the hospital's pharmacy and therapeutics committee. "We've developed a whole discussion group related to things like laboratory quality metrics and blood utilization," Terry said.

Wagar et al. (2019) noted that laboratorians demonstrate value by interfacing with others in healthcare. Organizational value is delivered communicating cross-functionally in hospital meetings (Adelman, 2012). Porter and Lee (2016) pointed out that value creation in healthcare does not occur in specialty silos, but rather in the teams working across the care cycle. Good communication systems require laboratory leadership to be involved outside of the laboratory (Passiment & Linscott, 2014). The networking of physicians with administrators aids in an exchange of healthcare best practices and protocols (Spaulding et al., 2018). Dr. Mick gave knowledge-based information when attending "tumor boards, collaboratives, and the medical executive committee." Dr. Lem attended quarterly blood transfusion meetings. Dr. Mick attended system-level laboratory stewardship meetings. Dr. Barb attended hospital operational meetings. Interdisciplinary participation improves diagnostic errors (IOM, 2015), inefficiencies, and ineffectiveness (Bodenheimer & Smith, 2013; Laposata, 2018b; Raebel et al., 2019). COLA (2015) recognized that laboratorians offer a knowledge-based service to clinicians that improves organizational competitive value. Terry assigned laboratory supervisors to attend most of the hospital interdepartmental meetings. Terry said laboratorians at H302 were "put in front of these groups to provide answers and bring back information...". Regarding the conveyance of value, Terry said, "We don't attempt to structure a time to convey that message, we attempt to be where the questions are being asked." Working collaboratively and effectively across organizational boundaries enhances PaLM's influence and builds strong allies with institutional leaders (Henricks et al., 2015). Nilsson et al. (2018) recognized that interdepartmental communication and collaboration are the best ways to promote organizational learning.

PaLM's Communication Methods.

Laboratorians presented information to hospital administrators via e-mail and text messages. Luke estimated that 95% of his communication occurred via e-mail. Luke added, "I don't like verbal communication for anything official because I don't have a record of it." Dr. Lem also communicated with emails, saying "…we e-mail a letter to administration, and administration in turn sends it out the medical staff." Guo (2011) pointed out that communication with e-mail, while flexible and time saving, could be problematic. Mary chose texting for daily communication with Dr. Mark. Mary also met monthly with Dr. Mark for a face-to-face meeting. Dr. Lem and Dr. Mick met quarterly with the hospital administration for information sharing.

Laboratorians communicated on system level dashboards for performance improvement projects and developed written reports for a variety of committee meetings. Mary tracked H510 PaLM performance data on a spreadsheet. Spreadsheets can demonstrate the clinical and economic benefits of new technologies (BaseCase, 2013). Mary and Dr. Mick noted the performance improvements made with a new track system were monitored with turnaround times in a spreadsheet. Dr. Barb reported pathology quality and performance metrics to hospital administration annually but said "on the clinical side (of laboratory), I don't know that we do as good of a job turning in a written report." Miller (2019) warns that simply reporting performance metrics does not necessarily "improve quality or costs to any meaningful degree" (p. 445). Mary was uncertain how hospital administration assessed her laboratory's quality efforts. Mary said, "they [administration] do not ask us for anything, we just try to give our assistance with the hospital quality measures by offering blood culture contamination rates."

Relationship to the Problem

The general problem addressed in this study was the failure of laboratory leadership to

communicate PaLM VBAs to healthcare administrators, resulting in lost opportunities to

demonstrate cost savings. This research finds that laboratory leaders regularly communicate with

hospital administrators but not about cost savings. Luke and Mary met monthly with a one-up in

administration. Dr. Barb, Dr. Lem, and Dr. Mick met quarterly with hospital administrators at

medical staff meetings. PaLM leaders regularly met with multidisciplinary committees.

Marlow et al. (2016) noted that the typical interests of a hospital CEO is on the patient

experience, satisfaction, and cost reductions. Luke disclosed to hospital administrators that his

remodeling project had improved patient experience. Dr. Mick, Dr. Lem, Luke, and Mary

discussed satisfaction surveys responses with hospital administrators. Employee engagement,

retention, and physician satisfaction were part of Mary's and Dr. Mick's annual performance

goals. PaLM cost savings activities, other than participation in system level contract

negotiations, had not been discussed with hospital administrators.

Improving costs and processes without sacrificing patient outcomes is the strategy for

VBHC delivery (Porter et al., 2017). Dr. Lem noted that conflicts occur regarding costs vs.

physicians wants. Dr. Lem said, "Issues arise when physicians want to order a multitude of

testing that may not be required." Conversations about costs relative to a patient's care were

described by Dr. Lem as "difficult" and "associated with risks to the patient." Value discussions

were described by Tracy as "raising defenses" and "ill-perceived as cutting positions." Epner

(2017) warned that linking cost savings to reductions in personnel or educational requirements

leads to negative impacts on patients and outcomes. Dr. Mark described point-of-care testing as

"a way to reduce FTEs and demonstrate cost savings" with nursing performing this type of

testing. Administrator Larry, with a nursing background, viewed point-of-care testing as a higher-cost, jeopardizing the use of laboratory's higher-quality test, with risks associated with a "longer patient length of stay and downstream costs."

COLA (2015) noted the importance of cost effectiveness in healthcare, which requires competent management and operational improvements. Davis et al. (2018) and Thakkar et al. (2015) discuss value from the consultative services of laboratorians. Improvements in efficiencies and costs were realized by Dr. Barb moving Covid testing in house and developing a test order algorithm. Dr. Mick discussed cost effectiveness with order algorithms for emergency room patients. Passiment and Linscott (2014) pointed out that competent laboratory management is a necessity for the identification of cost improvement opportunities. Dr. Mark, Dr. Mick, and Mary identified cost and efficiency improvements while working with laboratory leaders on the system stewardship committee. Dr. Mark described system level efforts as streamlining services and saving costs on "maintenance, contracts, and testing supplies".

Gross et al. (2019) discussed the need for value-defending conversations from laboratory leaders, championing the laboratory as core asset offering data "to vast array of enterprise strategies" (p. 616). This study found that laboratory leaders presented data to various committees including infection prevention, blood management, sepsis and stroke, hospital quality, risk, and pharmacy and therapeutics. Laboratory data was useful in assisting hospitals in meeting department goals. Dr. Mick described laboratory data as useful for the quality, collaborative, and medical executive committees. Tracy, Mary, and Luke identified the quality, infection prevention, and risk management groups as utilizers of PaLM data. Terry identified pharmacy and therapeutics committee, and radiology using laboratory's data.

PaLM leaders connected their department's activities with the measures recognized by

Marlow et al. (2016) i.e., the patient experience, physician satisfaction, and clinical quality.

Activities for laboratory data with analysis support hospital accreditation and status goals with

the publicly reportable measures identified by Tinker (2018) and Tierney (2017). However,

PaLM leaders in this study did not connect the value of their activities to a VBHC strategy.

Spaulding et al. (2018) pointed out that healthcare administrators were still in the discovery

phase of VBHC. B642 hospital administrators were "just beginning to look at VBHC," according

to Dr. Barb. H750 hospital administrators had not discussed VBHC as a strategy. Dr. Mark

pointed out that Texas hospitals "were slow to adopt VBHC strategies." Tierney (2017) noted

that hospital administrators establishing value-based management offices remained "unable to

articulate or demonstrate value" (p.22).

Tessier (2018) proposed that laboratorians need a comprehensive annual report detailing

value delivery with time studies, year-end accomplishments, committee attendance, process

improvements, patient experience scores, and even social media reviews. While Dr. Barb had

developed a year-end pathology summary for hospital administration according to the terms of

her pathology contract, she recognized the report as inadequate for detailing the clinical

laboratory's activities. Dr. Barb expressed the importance of not merely telling "a story and then

moving on" but rather "presenting and bragging about ourselves." Kridelbaugh (2018) noted that

regularly prepared promotional materials offered a form of marketing collateral for the

laboratory. PaLM leaders expressed barriers to reporting VBAs as a lack of time, competing

priorities, conflicts of interest, and a culture of presenting only what is asked for.

The specific problem addressed in this study was that laboratory leaders in acute care

hospitals fail to communicate VBAs to healthcare administrators, resulting in lost opportunities

to demonstrate cost savings. PaLM leaders were responsive to the requests of hospital

administrators and aligned certain PaLM activities with hospital goals. Although Texas based

hospitals were not following VBHC strategies at the time of this study, PaLM leaders identified

many value contributions to the organization and recognized laboratorians as a core competency

for success. Cost savings were not shared because as Dr. Mark stated, "We rate our laboratory

and pathology services from a customer perspective, not from a cost perspective." Likewise,

Mary commented "Our administrators have not asked for cost improvements." Terry responded

with "We really do not offer information unless specifically asked."

Some cost improvement ideas were not shared with hospital administrators due to the

perceptions of PaLM leaders. Some process improvement initiatives with test order algorithms,

preliminary reports, and instrument functionality were deemed as too difficult to explain to non-

clinical hospital administrators. Luke said, "even if I explained they may still not understand."

Dhand (2019) recommended avoiding medical jargon when communicating with hospital

administrators, depending on their clinical background. Luke had not shared a financial report on

his outreach program because he felt it was too insignificant. Luke also noted that administrators

had not requested cost savings information.

PaLM leaders presented quality data on system dashboards and at committee meetings

but avoided presenting cost savings. PaLM leaders expressed barriers in reporting cost savings as

a lack of per unit costs information and a lack of knowledge on how-to present cost avoidance.

Dr. Mick explained that "sharing of VBAs would require proof that we can provide a better

value." Dr. Barb complained of a lack of time to develop such a report. Maul et al. (2019)

recognized that group purchasing organizations aid presentations by providing per unit cost

reports for supplies. Kaplan et al. (2014) recommended time-driven activity-based (TD-ABC)

costing to demonstrate cost savings.

COLA (2015) states that cost savings occur in the forms of cost effectiveness, cost

containment, and operational efficiencies. Dr. Barb identified that a new test would reduce the

empirical use of anti-fungal medication as a cost-effective measure and training on the sterility

techniques for blood cultures would result in down-stream cost savings. Similarly, Fletcher

(2018) demonstrated cost effectiveness with a 3-hour reflexive troponin order to rule out

myocardial infarction which avoided $2000 per admission. Cost improvements and efficiencies

require the guidance of competent laboratory management to optimize cost effectiveness and

minimize waste (COLA, 2015). Larry described the H750 laboratory director as "constantly

looking for better ways and better machinery to improve patient testing." Price et al. (2016)

recognized that PaLM expertise is associated with cost reductions. As Larry noted, "The optimal

cost avoidance improves the patient's length of stay."

Utilization activities for laboratory testing improve direct and downstream costs (Schmidt

& Ashwood, 2015). Appropriate utilization improves effectiveness of care and avoids

downstream costs (Lewandrowski et al., 2017). Dr. Lem identified appropriate test utilization as

eliminating "low-volume, high-cost tests that were not cost-effective or necessary…and were a

poor utilization of resources." Dr. Lem described laboratorians as the "expert gatekeeper, making

sure that tests are required" and "setting parameters for ordering and spending." Dr. Mick and

Dr. Mark recognized PaLM expertise as necessary for educating providers on appropriate

utilization and waste improvements. Shirts et al. (2015) discussed prospective and variable types

of cost savings in efforts to develop electronic alerts for duplicate orders, prompts on

unnecessary orders, rules for combining and canceling orders, and results with comments with

instruction. Such systems-based interventions aim toward appropriate laboratory test utilization

offering a sustained cost savings (Sadowski et al., 2017). PaLM leaders at H302, H642, and

H510 noted utilizing systems-based utilization initiatives.

Summary of Research

RQ1 was designed to provide insight into the communication of cost savings by PaLM

leaders to hospital administrators. It was anticipated that PaLM leaders had failed to present cost

savings opportunities to hospital administrators (see Table 8). However, PaLM leaders

participating in system level contract negotiations demonstrate cost savings to hospital

administrators. PaLM participants in this study knew of VBAs and cost savings opportunities

that had not been communicated and noted that discussions of cost savings could be problematic.

RQ2 sought to identify from hospital administrators' perceptions, the effectively

communicated PaLM VBAs by laboratorians. It was anticipated that hospital administrators were

unaware of PaLM VBAs (see Table 8). However, hospital administrators perceived that PaLM's

high-quality testing improved the patient's length of stay and downstream patient care costs.

Hospital administrators measured PaLM's value with productivity metrics, and with physician

and patient satisfaction surveys. They recognized potential value associated with improving test

utilization and the streamlining of services and equipment. Laboratorians identified other types

of value, such as knowledge sharing by participation on multidisciplinary committees, hospital

quality, medical staff, and ad hoc discussion groups.

RQ3 delved into the communication of VBAs by PaLM leaders. It was anticipated that

PaLM leaders failed to communicate VBAs with hospital administrators (see Table 8). PaLM

leaders noted directly communicating with physicians and nurses, and hospital leaders in finance,

revenue, and other ancillary departments. Laboratory leaders developed and analyzed electronic

reports for test data, test volumes, and testing times which were accessible to hospital leadership. Quality departments utilized the laboratory's data to monitor efforts toward the achievement of hospital goals and reporting of performance measure to Medicare. Laboratory leaders communicated with system dashboards for testing information. PaLM leaders presented verbally at quality and clinical forums, medical staff meetings, and one-on-one meetings with hospital administrators. They utilized texting and emailing as a primary form of communication and provided tours of the department to hospital administrators.

RQ4 was designed to assess the alignment of PaLM VBAs with value-based objectives. I anticipated that hospital administrators would be pursuing value-based objectives and that phlebotomy customer service and turnaround times were monitored (see Table 8). VBHC strategies however, had not been implemented in Texas acute care hospitals at the time of this study and thus PaLM services were not aligned with value-based objectives. Nevertheless, PaLM leaders sought activity alignment with hospital goals for the patient experience, physician satisfaction, hospital accreditation, and status designation. Hospital administrators were unable to identify PaLM activities contributing to cost savings or a VBHC strategy.

Summary of the Problem.

The problem explored in this study was the failure of PaLM leaders to communicate VBAs to hospital administrators. While hospital administrators described PaLM leaders as not forthcoming with cost savings information, laboratory leaders expressed that hospital administrators had not requested cost savings information. Texas hospital administrators had not implemented VBHC strategies, nor requested demonstrations of VBHC activities. They assessed laboratory services based on physician and patient surveys, productivity, and turnaround time.

Laboratory leaders responded to requests for data and reported-out information that contributed toward the hospital's accreditation and status goals.

Porter et al. (2017) noted that healthcare cost reductions require the identification and modification of inefficient and ineffective processes. While some activities directly improve costs (Halstead et al., 2018; Price et al., 2016), other activities indirectly improve costs with improvements in efficiency, quality, or skills (Kushik et al., 2018; Lewandrowski et al., 2018; Schmidt & Ashwood, 2015). This study identifies PaLM cost savings within the service and support tracks of the mVCM (see Figure 2).

Laboratorians demonstrate value in the provision of direct patient care with bone marrow aspirations, thyroid biopsies, nasal swabs, and phlebotomy services. Laboratorians demonstrate value in activities to interface test results; optimize results information; ensure accurate and timely results; improve preanalytic, analytic, and post analytic quality; streamline and standardize processes; and consolidate system level purchasing. Laboratory leaders optimized hospital networks by establishing outreach testing that improves hospital revenue, continuity of care, and access to patient testing results. Laboratory leaders recognize value in activities that ensure appropriate utilization of testing, which subsequently offers cost savings and improves effectiveness of care.

Summary of the Purpose.

This qualitative case study adds to the body of knowledge by exploring the communication of PaLM VBAs. The interviews with PaLM leaders and hospital administrators identified a misalignment between the laboratory assessments utilized by hospital administrators and the value-based contributions of laboratorians. From the responses to scripted interview questions, themes emerged of PaLM VBAs, PaLM communication efforts, and PaLM strategic

alignment. Interviews with leaders in Texas acute care hospitals offered insights into the

communication efforts of laboratory leaders. PaLM leaders primarily shared requested

information via e-mails, departmental tours, dashboards, and by liaising with hospital nurses and

physicians at multidisciplinary meetings. The barriers for communicating PaLM VBAs were

identified as a lack of access to information, organizational layers, perceptions of information

insignificance, avoidance of conflict, a lack of time, and a culture of sharing only what is

requested. PaLM leaders identified difficulty obtaining per unit cost information, developing cost

avoidance reports, and finding time to develop presentations.

VBHC strategies necessitate an identification of improvement opportunities (IOM, 2013).

Improvements require a clear communication plan and an alignment of leadership (Frye &

Baum, 2016). The information obtained in this study offers insight into improvement

opportunities, communication forums, and PaLM's value contributions. This information

furthers the understanding of PaLM VBAs for hospital leaders implementing a VBHC strategy.

Laboratory leaders seeking to align with VBHC strategies will find insights to identify value and

the activities that contribute value. This study promotes the value contributions of laboratorians,

described by Davis et al. (2018) as essential but under-recognized. This study contributes the

need described by Anonychuk et al. (2012) for a broader perspective assessment of the

laboratory's value contributions.

Summary of Findings

The purpose of this study was not an exploration of the degree to which Texas hospitals

had adopted VBHC strategies. However, Texas Medicaid contracts were implementing value-

based payment models at the time of this research (Texas HHS, 2021). Spaulding et al. (2018)

noted that a hospital's ability to score well under a VBHC reimbursement model depended on

the organization's ability to learn and implement change. While VBHC strategies had not yet

been adopted in Texas hospitals, hospital administrators desired laboratory leaders to be more

forthcoming with value improvements and cost savings information. Likewise, PaLM leaders

expressed a desire for more appreciation of their knowledge and efforts. Kirkpatrick et al.

(2015) discussed that value increases as quality and costs improve. This research identified

some PaLM activities that directly reduced costs, while other PaLM activities improved quality,

efficiency, and/or effectiveness for an indirect cost savings. PaLM leaders also described VBAs

that offered enhancements to customer service and organizational competitiveness.

Hospital administrators recognized that high-quality laboratory testing is vital for the

diagnosis, prognosis, treatment, and management of human disease (Anonychuk et al., 2012;

Davis et al., 2018). While hospital administrators recognized the value of PaLM's high-quality

testing as improving patient care and length of stay, they assessed the laboratory's services based

on productivity and physician satisfaction surveys. Hospital-based laboratorians offer valuable

expertise that can improve test and transfusion utilization, test results interpretations, and

diagnostic accuracy.

Hospital administrators gained insights from the data presented by laboratorians.

Laboratorians communicated data on system level dashboards. Laboratorians offer other value-

adding contributions such as disseminating clinical information, attending multidisciplinary

meetings, direct patient care, providing expert consultation, and educating others in the

organization. PALM leaders recognized the value of well-trained phlebotomists, qualified

medical technicians, and highly educated clinical scientists as a core competency for hospitals,

which were not identified by hospital administrators.

Hospital administrators were unaware of PaLM leader's efforts to align with hospital goals and Medicare reportable measures. Laboratory data and interpretive expertise contributed to the hospital's achievement of Joint Commission accreditation, Magnet status honoring nursing value (Brennan, 2019), and Leapfrog recognition of patient safety (Leapfrog, n.d.). However, the lack of feedback from hospital administrators on the laboratory's contributions was a source of frustration for laboratorians, one of whom expressed, "It's all about nursing."

Laboratory leaders communicated operational challenges with hospital administrators using texting, emails, and verbally. Laboratorians communicated clinical information to patients, nurses, and physicians. PaLM leaders communicated hospital business leaders and offered departmental tours. While pathologists provided an annual report to administrators on pathology services, these reports did not communicate clinical laboratory VBAs.

Laboratory leaders utilized expertise and business skills in negotiating equipment and supply contracts and expanding outreach services. Some hospital administrators recognized this value., however they did not request cost savings demonstrations from laboratory leaders. Cost discussions were perceived as a potential risk rather than a desired value. COLA (2015) recommended that laboratory management present cost improvements as a form of cost effectiveness and/or operational efficiency. PaLM leaders acknowledged difficulty ascertaining per unit cost information and presenting cost avoidance efforts. While laboratory leaders could describe VBAs that avoided costs, improved downstream costs, and optimized efficiency and effectiveness, communication barriers presented a challenge. They identified these barriers as a lack of time and knowledge and perceptions of insignificance. PaLM leaders did describe their efforts to improve test utilization, however these utilization efforts were not necessarily benchmarked or presented as a cost savings to hospital administrators.

Conclusions

PaLM leaders have yet to fully explain their full range of clinical and management activities (Burns, 2018). Laboratory professionals have the necessary skill sets to generate and interpret data, establish reference ranges, present test results with clinical information, improve order menus, assess laboratory data for health disparities and reduce healthcare costs (Wheeler et al., 2021). Hospital laboratorians involved with data analysis, process improvements, and the dissemination of knowledge improve patient outcomes (Howanitz & Howanitz, 2001). Organizational knowledge, skills, and methods improve with cross functional communication (Grove et al., 2019; Lewandrowski et al., 2018; McFadden, 2014).

The delivery of VBHC with process improvements and cost reductions (Porter et al, 2017) requires an understanding of the value streams and the value within healthcare (Miller, 2019; Protzman et al., 2015). Hospital administrators seeking to implement the rich objectives of a VBHC strategy (Larsson & Tollman, 2017) need awareness and inclusion of the laboratory for optimal success (Misialek, 2014). Recognizing value is a critical step for success (Misialek, 2014). As Kridelbaugh (2018) pointed out, a concerted effort by laboratory leadership is necessary to keep senior management informed of recent developments and accomplishments. Hospital administrators cannot fix organizational deficiencies without tapping into departmental knowledge (Salahshor, 2016). Perhaps convincing others of the need for change is a step in the right direction (Green et al., 2018).

Application to Professional Practice

During the two years taken to complete this multi-case study, national healthcare expenditures in the United States grew 9.7% to $4.1 trillion, accounting for 19.7% of GDP in 2020 (Centers, 2021a). Healthcare systems around the world continue to struggle with rising

costs (Porter & Lee 2013). While Porter and Teisberg offered theoretical guidance in 2006 for

VBHC, the associated complexities with value have presented barriers to implementation

strategies (Zanotto et al., 2021). The work of solving healthcare's unsustainability and

inefficiencies (Cosgrove et al., 2013; IOM, 2013) guided by a triple aim (Berwick et al., 2008)

has evolved into a quadruple aim, adding the goal of improving the lives healthcare workers

(Bodenheimer & Sinsky, 2014).

PaLM's innovative testing technologies proved pivotal during the Covid-19 pandemic for

achieving more accurate and efficient diagnosis and improved patient outcomes (Arshoff, et al.,

2021). However, the reported vacancy rates for laboratory professionals reached critical highs

(ASCLS, 2020). Subsequently, nearly 2.8 million healthcare workers quit their jobs in what has

been dubbed the Great Resignation (Wallask, 2022). As the demand for laboratory testing

increases, the number of qualified personnel to perform laboratory testing continues to decline

(ASCP & CWH, 2021). Laboratory leaders continue to report the need for qualified personnel,

solutions to staffing challenges, and wages commensurate with education and experience (Garcia

et al., 2021).

Improving General Business Practice

Hospital administrators need to recognize the value contributions from laboratorians and

need to "provide opportunities career progression, increased pay, and elevated titles" (ASCP &

CWH, 2021, p.5). Hospital administrators need awareness and inclusion of laboratorians

(Misialek, 2014) offering unique solutions that improve healthcare's inefficiencies,

ineffectiveness, costs, and outcomes (Ashoff et al., 2021). Laboratorians with advanced

education play an important role in improving patient safety and care (Zaucha, 2021).

Implementation of a VBHC strategy requires engaged healthcare managers and experts like the laboratorian in data collection and technological advances (Tsai, Porter, & Adams, 2018). To achieve the goals of VBHC, laboratorians must communicate and be involved outside of the laboratory (Passiment & Linscott, 2014). Value creation in healthcare does not occur in specialty silos, but rather in the working teams across the care cycle (Porter & Lee, 2016). Organizational leaders must encourage the building of trusted relationships and effective communications (Aldeman & Stokes, 2012) with PaLM services. Laboratorians need to share their expertise by serving on hospital committees, taking on assignments with nursing units, and being a recognizable liaison (Passiment & Linscott, 2014). Such interfacing with other healthcare experts enhances professional influence and demonstrates value (Wagar et al., 2019). Additionally, interdisciplinary participation improves diagnostic errors (IOM, 2015), inefficiencies, and ineffectiveness (Bodenheimer & Smith, 2013; Laposata, 2018b; Raebel et al., 2019). Organizational knowledge improves with shared experiences among and between employees (Nilsson et al., 2018) and the differing perspectives refine, update, and transform the organization (McFadden et al., 2014).

Laboratorians offer knowledge-based services to clinicians that improve competitive value (COLA, 2015). Organizations that commit to knowledge sharing and skills improvement enhance the hospital's competitive advantage (Gambel et al., 2019; Swayne et al., 2006). Surveys indicate that most executives believe the laboratory offers an important function in healthcare delivery (Economist, 2018). Texas hospital administrators perceived the value of PaLM's high-quality testing efforts but were unaware of other roles and the scope of activities (Branda et al., 2014), and overlooking the laboratory when seeking value improvement opportunities (Downs & McMinn, 2017; Shrinkman, 2016). Hospital administrators did not

identify the PaLM VBAs improving organizational knowledge, care effectiveness, patient

outcomes, quality, safety, and profitability. Protzman et al. (2015) noted that hospital

administrators lack a clear understanding of the value streams and the interconnectivity of

processes.

Potential Application Strategies

The need for healthcare and the consequent care delivery expenses continue to rise

exponentially. VBHC strategies offer theoretical guidance, however presenting value has proven

complex, and the communication value has many variables. The Covid-19 pandemic drew

attention to the laboratory's value contributions toward accurate and timely diagnoses (Linder,

2020, ASCP & CWH, 2021). Yet the laboratory profession continues to struggle with staffing

challenges, qualified personnel, and wages equivalence (Garcia et al., 2021). This study offers

recommendations for hospital administrators seeking to improve value in the patient experience,

employee satisfaction, and costs. Hospital administrators reviewing this study have access to the

PaLM concepts that improve value with process improvements, outsourcing, equipment

contracts, supplies standardizations, revenue generation, cost saving, improved utilization, and

knowledge sharing. Transparency and analysis of the value chain is necessary if value is to

increase (Schmidt, Flores, & Montgomery, 2020). The categories within the value-chain are the

proven essentials of value creation (Swayne et al., 2006).

PaLM Assessments.

Texas hospital administrators assess laboratory services based on turnaround times,

productivity, and customer survey responses using relatively easy-to-access data measures

(Nilsson et al., 2018). Such volume and structural assessments, while vague on the provision of

value (Lazar et a., 2013), improve with higher educated employees, technological advances, and

capital investments (Sheiner & Malinovskaya, 2017). However, siloed performance assessments

fail to capture organizational improvements (Plebani, 2016; Price et al., 2016) or to facilitate

behavioral changes from the patient perspective (Nordkin, et al., 2017).

This study identified a misalignment between the assessments utilized by Texas hospital

administrators for PaLM services and the value contributions recognized by laboratory leaders.

There is no single set of core metrics universally accepted for the measurement of value

(Carmicheal et al., 2016). Process compliant track-and-trend measures distract from the "more

significant goal of improving health outcomes" (Teisberg et al., 2020, p. 682). Although as

Orefield (2000) points out, patient outcomes are really a measure of process results. Ideally,

selected value measures judge in a manner consistent with the main goals of the health system

(Sikaris, 2017) with guidance by the quadruple aim of improving the patient experience, health

outcomes, costs, and the team's well-being (Arnetz et al., 2020).

Hospital administrators seeking to improve organizational efficiency (Vrijsen et al.,

2020) may adopt different assessments for laboratory services, such as a measurement for the

number of inpatient laboratory tests per patient day, the volume of laboratory orders cancelled, or

the number of specimens rejected as measures of process errors (Stottler & Kratz, 2012;

Hawkins, 2012). Since most laboratory failures occur in the pre-analytic phase (McCray, 2009)

improving process defects would facilitate better productivity (Hallworth, 2015) and quality

(Chawla et al., 2010). Identifying and correcting errors consumes inordinate resources (Carlson,

2012), while reducing errors improves organizational efficiency (Tsai et al., 2019).

Hospital administrators utilize patient satisfaction surveys to assess laboratory services.

Surveys have shown that patients value access to their own health information (COLA, 2019b)

and easily retrievable laboratory test results (Passiment & Linscott, 2014). Thus, patient centric

feedback could clarify the laboratory's discussion of access to the online patient portal for test results. Since patients want readability, relevance, and next steps from PaLM test reports (Kelman et al., 2016; Poczter & Giugliano, 2014) and feel empowered with face-to-face consultations (Booth et al., 2018), patient surveys should assess these attributes.

Measuring ancillary services solely on test volume and cost (Bergeron, 2017) misses other important unreimbursed activities (Wilson, 2014). Optimal assessments avoid siloed performance measures, rather focusing on organizational learning and partnership development (Johannessen, 2021). Networking for example, could be viewed as unproductive but facilitates the exchange of best practices and protocols in healthcare (Spaulding et al., 2018). Hospital administrators promoting team activities provide connection opportunities, promote learning and the dissemination of knowledge and skills, and seek to enhance employee satisfaction (Nilsson et al., 2018; Carman et al., 2014). Assessing PaLM leadership's involvement with hospital committees and stewardship programs offers an actionable form of intelligence.

PaLM Involvement & Communication of Value.

Patient care improves when laboratorians are involved with decision support systems, order sets, algorithms (Sarkis, 2017), utilization efforts, electronic demand management, and reference test gatekeeping (Lewandowski & Sluss, 2017). Utilization efforts enhance the patient's experience by eliminating unwarranted testing, unnecessary downstream follow ups, prolonged hospital stays, and iatrogenic anemia (Gupta et al., 2017). Clinical outcomes improve when laboratorians partner with clinicians (Patel & Fang, 2018). Interdisciplinary participation improves diagnostic errors (IOM, 2015). Surveys indicate that 60% of healthcare providers would appreciate clinical laboratorians offering diagnostic related education (Economist, 2018).

Organizations that commit to knowledge sharing and skills improvement enhance their

competitive advantage (Gambel et al., 2019; Swayne et al., 2006).

Laboratory leaders demonstrate value by interfacing with other healthcare professionals

(Wagar et al., 2019) and communicating cross-functionally (Adelman, 2012). Communicating

PaLM VBAs to hospital administrators demonstrates the efforts that transform operations (Fusch

& Gillespie, 2012). PaLM leaders need an improved communication strategy (Passiment &

Linscott, 2014) with more involvement in hospital operations, and more publishment of evidence

regarding their efforts to improve clinical, operational, and economic outcomes (Davis et al.,

2018; Delvin, 2017; Epner et al., 2017; Landin, 2013). Well-performed presentations establish

professional credibility (Weinholdt, 2006).

PaLM's Role in Healthcare Costs.

Laboratorians play a vital role in cost-effectiveness, error reduction, and improved patient

outcomes (Nadder, 2013). Competent laboratory management guides improvements in

operational efficiencies and per unit cost savings (COLA, 2015). Consultation with doctorate

level CLSs results in improved care and significant cost savings (Hendren & Gunsolus, 2018).

Costs improve by eliminating orders variations and low-value testing that generates waste (Wong

& Hilborne, 2021). Healthcare costs needlessly increase without the judicious use of laboratory

resources (Lewandrowski et al., 2017). Sustainable cost reductions are found in the identification

and modification of inefficient and ineffective processes (Porter et al, 2017). Implementing waste

elimination measures reduces healthcare costs (Shrank et al., 2019).

VBHC necessitates thinking in terms of value ROI, rather than financial ROI (Green et

al., 2018). Value metrics for diagnostic services ideally demonstrate outcomes achieved relative

to the cost of care (European, 2017), although few organizations accurately measure costs in

healthcare (Lee et al., 2016). PaLM professionals use a variety of cost descriptives including cost

containment, cost effectiveness, cost reductions (COLA, 2015), downstream costs, cost

avoidance (Schmidt & Ashwood, 2015), cost savings, cost improvements, (Halstead et al., 2018;

IOM, 2013; Price et al., 2016), prospective cost, variable costs (Shirts et al., 2015), and cost

effectiveness (Misialek, 2014). Most agree that true costs in healthcare depend on the actual

resources involved in care delivery (HBS, n.d.). The cost reducing activities of this study were

identified within the activities of the value chain. PaLM leaders need a better understanding of

the value-chain and a better presentation of cost savings efforts for hospital administrators. Time-

driven activity-based costing seems well suited to capture the effects of process changes on cost

variation (Kaplan & Price, 2011).

Summary of the Applications to Professional Practice

VBHC strategy implementations necessitate the need for field experts, like laboratorians.

Hospital administrators studying VBHC need an awareness of the value from PaLM experts.

Healthcare value does not occur in specialty siloes (Porter & Lee, 2016), but rather in interfacing

and interdisciplinary participation (IOM, 2015) with shared experiences. The hospital

administrators in this study did not perceive the PaLM value associated with improvements to

organizational knowledge, profitability, safety, or costs. As Protzman et al. (2015) pointed out,

hospital administrators lack a clear understanding of PaLM's value chain. Mismatched

assessments need to be redirected (Arnetz et al., 2020) toward the quadruple aim and the goals of

the health system (Sikaris, 2017). PaLM professionals have failed to connect the laboratory's

critical value-adding activities to strategic imperatives (Dixon, 2019). Rather than faulting either,

collaborative efforts should be emphasized (Henricks et al., 2015) and tapping into the

laboratory's value chain.

Recommendations for Further Study

The value offerings of PaLM improve health care, enhance organizational performance, and reduce costs (Orfield, 2000). PaLM expertise is instrumental for VBHC strategies that require the identification, selection, and prioritization of improvement initiatives (Raebel et al., 2019). The contributions of laboratorians improve outcomes and lower costs, albeit these contributions have been ineffectively communicated to hospital administrators. Monitoring continuous improvement targets within the value chain aims for operational excellence (Gambel et al., 2019). Hospital administrators need more awareness of PaLMs value chain and incentives to remove barriers for laboratory professionals. Laboratorians need further exploration of their profession's value chain and a well thought out communication plan.

Value Chain Development

The value chain is utilized by business analysts to evaluate the opportunities that maximize profitability and competitive advantage (Gambel et al., 2019). The current climate in healthcare requires a justification of activities and expenditures from every sector as a demonstration of value (Nadder et al., 2018). PaLM leaders need to further explore the laboratory industry value chain. Developing methods to quantify and communicate a laboratory's VBA is critical for the profession (Davis et al., 2018). The PaLM industry has not fully explained their range of clinical and management activities (Burns, 2018). PaLM's value-chain contributions require further investigation (Hallworth et al., 2015) with more research delving into the laboratory's value creating ecosystem (see Fig 4.0). Effective value frameworks need to be accessible to stakeholders, as each stakeholder has differing perspectives and priorities (Thaker et al., 2016). The value-adding services from hospital laboratories (COLA, 2015) need to be communicated to hospital administrators making strategic decisions.

Cost Recognition

Laboratory leaders need further clarity on how to demonstrate value and cost savings with published articles and peer reviewed literature. Laboratorians need examples for sharing their knowledge on how-to implement VBAs, chronicling obstacles and successes. The value-adding skills and methods utilized by laboratorians need to be communicated outside the laboratory profession, demonstrating the magnitude of cost savings lying within PaLM's value chain (Kiechle et al., 2014; Reedy & Procop, 2019). Likewise, healthcare administrators need more understanding of the cost producers within their facility (Schmidt et al., 2020).

Implementation of value-based initiatives depends on cost-assessment methods like TDABC to demonstrate reliable information on cost-savings opportunities (Etges-Eng et al., 2020). TDABC is rapidly becoming the standard measurement for healthcare's true costs replacing surrogate measurement based on procedural charges and reimbursement rates (Thaker, 2016). TDABC enables an accurate cost estimation (Kaplan, 2017) and provides cost data details with process maps for attributing costs to resource utilization and for motivating hospital departments (Kaplan & Porter, 2011). TDABC allows for detailing direct and indirect costs by identifying patient-specific resource consumption (Etges-Eng et al., 2020), and making visible the high cost of redundant processes (Kaplan & Porter, 2011).

Communication and Appreciation

Ineffective communication is the most frequently reported deficiency among service-oriented managers (Kerns, 2016). Effective communication begins with a desire to communicate (Guo, 2011), the skills for which can be learned and improved (Otto, 2017). The development of methods to quantify and communicate the laboratory's value offerings are critically important (Davis et al., 2018), requiring research and well thought out plan (Raman, 2014).

PaLM leaders communicate using e-mails, departmental tours, dashboards, and face-to-face conversations, but remain challenged with barriers for communicating value-based initiatives. Laboratory leaders need a tailored persuasive message that aligns their VBAs with the concerns and priorities of the hospital administrators (Gross et al., 2019). The transformational efforts of hospital laboratorians need to be communicated to the healthcare administrators responsible for setting the goals and objectives, monitoring performance, and allocating resources.

Laboratorians are data driven (Wagar et al., 2019) and communicate well with metrics on quality projects (Bergeron, 2017; Bixho & Melanson, 2017). Metrics that reflect performance improvements can highlight areas of need (Sarwar et al., 2015) and offer insights to hospital administrators. Equipment vendors implementing new laboratory technologies can aid laboratory leaders with demonstrating cost savings and the value associated with improving diagnostic accuracy and timeliness (Epner et al., 2017). Success reports provide a useful communication tool (Hartland, 2018). Radar charts within Excel provide a visual framework for integrated outcomes with cost information (Thaker, et al., 2016). Laboratory professionals need further development of how to document and publish VBAs (Delvin, 2017; Landin, 2013). Well-performed public presentations tailored toward the executive level establishes credibility (Weinholdt, 2006) and well-prepared promotional materials offer a form of marketing collateral (Kridelbaugh, 2018). Demonstrating with certainty the effectiveness of VBAs and the gains in cost savings provides the necessary political support (Øvretveit, 2009).

Reflections and Final Thoughts

According to Church and Naugler (2020), PaLM is a service business focused on operational efficiency and quality testing. They posited that organizing hospital laboratories into

factories performing chemistry, hematology, microbiology, pathology, and genetics testing with

siloed performance measures of productivity devalues the essential clinical offerings of

laboratorians as partners in patient care. Improving evidence of PaLM's professional and

industry value aids in the recognition and appraisal of laboratory services. Laboratory

"professionals are poised to contribute to more effective and efficient diagnostic and therapeutic

protocols and should be invited to be part of guideline development panels" (AACC, 2017,

par.6.). However, as the demand for laboratory testing increases, the number of qualified

personnel to perform laboratory testing declines (ASCP & CWH, 2021). Hospital administrators

must recognize the value contributions of laboratorians with pay equivalence and "provide

opportunities for career progression, increased pay, and elevated titles" (ASCP & CWH, 2021,

p.5).

Demonstrations of the laboratory's value contributions is essential to resolving workforce

shortages (ASLCS, 2018). Appreciation, professional visibility, and wage equivalency are

necessary to address the laboratory's recruitment and retention issues (ASCLS, 2018; CCCLW,

2018; Han, Carter & Champion, 2018). Optimization of skill sets, and professional

acknowledgement improves employee satisfaction (Carman et al., 2014; Nilsson et al., 2018).

High-performing organizations seek to ensure the engagement of all stakeholders when

optimizing value (Carmen et al., 2014), empowering the entire organization to keep a watchful

eye on the organization's transformation (Stroh, 2015).

Personal & Professional Growth

I have longed for more knowledge on the value contributions of my profession. As with

most long-term laboratory professionals, my scientific knowledge and clinical training are quite

extensive. However, this research has afforded me two years to focus solely on communicating

PaLM VBAs, and to reflect on my own responsibilities as a laboratory leader. I own the responsibility to ensure skills development, continuous learning, professional networking, and adequately credentialed staff (Delost et al., 2009; Dickerson et al., 2017; Lorenz et al., 2018) and to advocate for the publishment of articles by laboratorians.

This research has broadened my understanding of the perceptions of hospital administrators concerning the laboratory's value, and the perceptions of PaLM leaders concerning the barriers to communicating value and cost savings. I have gained an understanding of what it will take to improve value in healthcare, and to strengthen the laboratory profession. I strongly recommend with evidence that hospital administrators implementing VBHC strategies include laboratory professionals in hospital improvement activities. Connecting laboratorians with other healthcare professionals promotes organizational learning and knowledge dissemination.

Biblical Perspective

All humanity is inherently hard-wired to create and to desire meaningful work (Genesis 2:15; VanDuzer, 2010). The work of this research, as a culmination of my life's work, has brought me great satisfaction. I am reminded that God defined the value of His work as very good in Genesis 1:31. Being created in God's image, we are inherently gifted to perform excellent work (Keller & Alsdorf, 2012) and to be good stewards of His resources. As a reflection of His image, all healthcare workers are designed and assigned to create value, to bring order, and to communicate with others (Van Duzer, 2010; Genesis 1:27). Our instructions for Paradise on this earth are to work, and to keep working, maintaining the garden given to us (Keller & Alsdorf, 2012; Bohlin, 2016). And when our work is done, we rest, even as God rested (Genesis 2:2).

Laboratorians are exhausted as the toll of the two-year Covid-19 pandemic nears an end. It seems little wonder the triple aim of VBHC morphed a fourth objective, i.e., to improve the lives of healthcare workers. But we are built for this work and to perform it with dignity (Keller & Alsdorf, 2012). I pray that as a PaLM leader I will help others to identify value in their work and to achieve their optimal potential. May our work one day be viewed as well done.

Summary of The Study and Conclusions

This study involves interviews with three Texas hospital administrators and six PaLM leaders from four purposively selected hospitals. All hospitals were acute care and JCO accredited with variations in bed size and laboratory accreditation agencies. All laboratory participants noted service alterations related to the Covid-19 pandemic. Data collected from the nine interviews, followed by a coding of case themes and in-depth cross-case categorical analysis, revealed that while operational challenges were regularly communicated to hospital administrators, demonstrations of PaLM VBA and cost savings were lacking.

The data indicated that Texas laboratories contribute many activities that improve value in healthcare. However, hospital administrators did not request value demonstrations or cost savings from laboratory leaders. Laboratory leaders communicated regularly with hospital leaders on the information needed to achieve hospital accreditation and status goals, but PALM VBAs and cost savings information were not part of these objectives. Integrated system activities, equipment and supply contracts negotiations, multidisciplinary interactions, and stewardship committees offered opportunities for laboratorians to demonstrate value.

The findings of each case are discussed with quoted examples for the three overarching themes that emerged: PaLM VBAs, PaLM communication, and PaLM's strategic alignment with hospital goals. Seven forms of communication with hospital administrators were identified. Six

forms of value were categorized based on the interviewee responses, then evaluated against the

literature and the mVCM framework in section 1 (see Fig. 2). The laboratory's alignment with

hospital objectives was distinguished by the feedback from hospital administrators, the

assessments utilized for PaLM services, and the identified hospital goals (see Section 2. Fig. 9,

11). The actual versus anticipated findings are summarized in section 3 (see Table 8). A

communication model by Robbins et al. (1994) identifies the components necessary for effective

communication (see Fig. 1). This study identified that PaLM leaders have an opportunity to

clarify the profession's value message to hospital administrators and to demonstrate value

contributions and cost savings. It is noteworthy that none of the four hospital cases had

implemented VBHC strategies or utilized a doctorate level CLS as an interface for hospital

administrators. Perhaps VBHC and this new doctoral role for laboratorians will advance the

effective communication of PaLM's value.

The need for healthcare and the associated rising costs continue to expand exponentially.

The complexities and barriers for demonstrating value must be conquered for VBHC strategies

to be effective. The Covid-19 pandemic occurring during this study highlighted the value of

hospital laboratorians and the need for a quadruple aim. Inadvertently, the data revealed that a

lack of qualified laboratory personnel without wage equivalence to similar educated

professionals lowers value in healthcare. Hospital administrators need recognition of PaLM's

value. Laboratorians need "opportunities for career progression, increased pay, and elevated

titles" (ASCP & CWH, 2021, p.5). Hospital administrators need an awareness of the value chain

and the interconnectivity of process to implement VBHC strategies. VBHC will present leaders

with an opportunity to clarify value and to demonstrate cost savings. Active engagement from

PaLM leaders outside the laboratory, participating on teams across the care cycle, interfacing

with other healthcare professionals, providing influence, and presenting value demonstrations is

essential to improving healthcare value and lowering costs.

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Appendix A: Informed Consent for Participation in Research

Communicating the Value Contributions of
Pathology and Laboratory Medicine (PaLM)
to Healthcare Administrators,
Evidence from a Multiple Case Study

You are invited to be in a research study on the communication of Pathology and Laboratory Medicine's value. You were selected as possible participant because you are 18 years of age or older, currently employed or contracted full time as either a hospital administrator or laboratory leader at an acute care hospital with on-site laboratory services, and knowledge of value-based activities. You have been in your position for at least 1 year. Please read this participation form and ask any questions you may have before agreeing to be in this study. A doctoral candidate in the School of Business at Liberty University, is conducting this study.

Background information: The purpose of this study is to provide evidence of the communication between hospital laboratory leadership and hospital administrators concerning value-based activities (VBAs) – i.e., the activities that improve value, generally, referred to as improvement approaches. VBAs result in improvements in quality, the patient experience, efficiency, and ultimately cost. A value-based strategy lowers costs, improves quality or provision of service excellence, or surpasses rival capabilities. The current climate in healthcare requires a justification of the activities and expenditures from every sector, demonstrating value to the patient and the health system. This study explores the communication of value-based activities to better understand the effectiveness of value demonstrations and the alignment of these activities with value-based strategies promoting performance improvements, quality & safety, and cost reductions.

Procedures: If you agree to be in this study, I will ask that you do the following:
- Participate in an audio-recorded interview. This should take approximately 50 minutes to complete.
- Review your post interview transcript for accuracy and provide a response. The transcript will be emailed to you within a few days after the interview and should take less than 20 minutes to review.

Risks: The risks involved in this study are minimal, which means they are equal to the risks you may encounter in everyday life.

Benefits: Participants should not expect to receive a direct benefit from taking part in this study. Benefits are to society and include an increased knowledge of value demonstrations for healthcare professionals.

Compensation: Participants will not be compensated for participating in this study.

Confidentiality: The records of this study will be kept private. In any reports that I might publish, I will not include any information to make it possible to identify the subjects. Research records will be securely stored, and only the researcher will have access to the records. I may share the data collected in published literature or with researchers of future research studies.

However, if I share collected data, I will remove any identifying information that could identify participants or sites prior sharing the data.

- Participants will be assigned a pseudonym. I will conduct the interview in a location where others will not easily overhear our conversation.
- Data will be stored on a password locked computer and may be used in future presentations. After three years, all electronic records will be deleted.
- Interviews will be recorded and transcribed. Recordings will be stored on a password locked computer for three years and then erased. Only the researcher will have access to these recordings.

Voluntary Nature of the Study: Participation in this study is voluntary. Your decision to participate or not to participate will not affect your current or future relations with Liberty University. If you decide to participate, you are free to decline answering any questions or to withdraw from the study.

How to withdrawal from the study: If you choose to withdraw from this study, please contact the researcher at the email address / phone number included in the next paragraph. Should you choose to withdraw, the data collected from you will be destroyed immediately and will not be included in this study.

Contacts and Questions: The researcher conducting this study is a doctoral student. You may ask any question you have now. If you have questions later, you are encouraged to contact the researcher. You may also contact the researcher's faculty chair.

If you have any questions or concerns regarding this study and would like to speak with someone other than the researcher, please contact the Institutional Review Board.

Please notify the researcher if you would like a copy of this information for your records.

Statement of Consent: I have read and understand the above information. I have asked questions and received answers. I consent to participate in this study.

☐ The researcher as my permission to audio-record my responses as participation in this study.

Signature of Participant: _____Date: _____

Signature of Investigator: _____ Date: _____

Appendix B: Participant Recruitment Letter

[date]
[Recipient]
[Title]
[Company]
[Address]
[City, State, Zip]

Dear Hospital Administrator or Laboratory Leader,

I need your help. As a doctoral student in Healthcare Administration at Liberty University's School of Business, I am conducting research as a requirement for my degree.

The purpose of my study is to provide evidence of the communication between hospital laboratory leaders and hospital administrators concerning value-based activities (VBAs) – i.e., activities that improve value, generally referred to as improvement approaches. Value based activities result in improvements in quality, the patient experience, efficiency, and ultimately cost. A value-based strategy lowers costs, improves quality or the provision of service excellence, or surpasses rival capabilities. The current climate in healthcare requires a justification of the activities and expenditures from every sector, demonstrating value to the patient and the health system. This study explores the communication of PaLM VBAs to better understand the effectiveness of value demonstrations and the alignment of activities with value-based strategies that promote performance improvements, quality & safety, and cost reductions.

Participants will be asked to participate in an audio-recorded interview. This will take approximately 50 minutes to complete. Participants will also be asked to review their interview transcript for accuracy. Interview transcript will be emailed to participants after the interview. It should take less than 20 minutes to complete the review and provide feedback. This study may benefit the healthcare industry and laboratorians by increasing the knowledge of value demonstrations.

Participants sought for this study must currently be 18 years of age or older and be a hospital administrator and laboratory leader knowledgeable of value-based activities (VBAs). Participants must be full-time employed or contracted with an acute care hospital for at least one year. Participant names and other identifying information requested as part of this study will remain confidential information.

For participation, please e-mail _____to schedule an interview. A consent document attached to this message will also be available at the time of the interview. The consent document contains information about this research. Please review the consent document as it will be signed at the time of your interview.

Appendix C: Interview Protocol

Participant Pseudonym / Title Length of employment	Date/time of interview: Interview start time: Interview stop time:	Hospital Pseudonym:

Introduction

[Script] Hello. My name is _____. Thank you for your willingness to participate in the interview aspect of my study. I am a doctoral researcher working on my required dissertation. The purpose of my study is to provide evidence of value communications between hospital laboratory leaders and hospital administrators.

If you have not already done so, please take a moment to read and sign the **Informed Consent for Participation in Research.** Feel free to ask me any questions you may have about this study, or the processes involved. [Collect Informed Consent signature]

Verbal Explanation of the study	**Please allow me to read a few statements concerning this study**
	The purpose of my study is to provide evidence of the communication between hospital laboratory leaders and hospital administrators concerning value-based activities (VBAs). VBAs improve value and are generally referred to as improvement approaches and include activities that result in improvements in quality, the patient experience, efficiency, and ultimately improve costs.
	     A value-based strategy lowers costs, improves quality or provision of services, or surpasses rival capabilities. The current climate in healthcare requires a justification of the activities and expenditures from every sector, demonstrating value to the patient and the health system.
	     This study explores the communication of VBAs by pathologists or laboratory leaders to better understand the effectiveness of value demonstrations and the alignment of these activities with VBHC strategies that promote performance improvements, quality & safety, and cost reductions.

Allow response	[Script: Allow for unstructured discussion] **My use of the term lab or laboratory refers to hospital services provided by either pathology or laboratory medicine departments. Kindly respond to the following questions. It's okay if you don't have or know an answer.**
Introductory question	[Present publicly available information and allow open discussion for how laboratory might fit into these public scores] **How does hospital administration assess laboratory and pathology services?** **How does this information align with the hospital's performance goals?**
TABLE 10	[Proceed with questions in Table 10 according to interviewee type]
Closing statement	**Thank you for your time today. I'll be sending you a copy transcript of our interview in a few days. Please review it and either confirm its accuracy or add further comments or clarifications.** [Script: Review e-mail address accuracy]
End	**Who else would you recommend that I interview for this study? Please send an introductory email on my behalf.** [Script: Gather referral name and e-mail address, and assign pseudonyms]
Notes	[Researcher journals thoughts / impressions]

Table 10.

Case Study Interview Questions

Task	Case Notes
Laboratory Leadership Interview Questions	
	Describe for me several activities implemented by the laboratory to improve services.
	How have you communicated these activities to administration?
	Describe some initiatives of laboratory that improve value for the hospital
	How have you shared these value-based activities with hospital administration?
	How might these activities align with a value-based strategy?
	What feedback has hospital administration provided to you concerning these activities?
	When you discuss these activities with administration, how do you present your message?
	What feedback has administration provided regarding these recommendations?
	What barriers do you perceive in communicating lab's value-based activities to administration?
[Differentiation factor]	Who would you say is the primary interface from Pathology and Laboratory services to the hospital? Path / DCLS / CLS Manager / other
Hospital Administrator Interview Questions	
	Describe how laboratory leadership communicates initiatives with you
	How does laboratory leadership make you aware of cost savings opportunities?
	How have other value-based activities been presented to you?
	What are some examples of effective initiatives presented by the laboratory?
	How do the lab's value-based activities align with the strategic objectives of the hospital?
	How might the laboratory improve communication of value-based initiatives to you?
	What barriers do you perceive for the laboratory being able to effectively communicate their value-based initiatives?
[Differentiation factor]	Who would you say is the primary interface from Pathology and Laboratory services to the hospital? Path / DCLS / CLS Manager / other

Table 11.

Research Questions alignment with Interview Questions

Research Questions / Interview Questions	What value-base cost savings opportunities has laboratory leadership presented to hospital administrators?	What value-based opportunities are perceived as effectively communicated by laboratory leaders to hospital administrators?	How do hospital-based laboratory leaders communicate PaLM VBAs to hospital administrators?	What PaLM VBAs do hospital administrators perceive as aligning with the value-based objectives?
Laboratory Leadership Interview Questions				
Describe for me several activities implemented by the laboratory to improve services.	X			
How have you communicated these activities to administration?			X	
Describe some initiatives of the laboratory that improve value for the hospital	X			
How have you shared these VBAs with hospital administration?	X		X	
How might these activities align with a value-based strategy?				X
What feedback has hospital administration provided to you concerning these activities?		X	X	
When you discuss these activities with administration, how do you present the message?	X	X	X	
What feedback has administration provided regarding these recommendations?		X		X
What barriers do you perceive in communicating lab's value-based activities to administration?		X		

Hospital Administrator Interview Questions				
Describe how laboratory leadership communicates initiatives with you		X	X	X
How does laboratory leadership make you aware of cost savings opportunities?	X		X	
How have other value-based activities been presented to you?	X		X	
What are some examples of effective initiatives presented by the laboratory?	X	X		
How do the lab's VBAs align with the strategic objectives of the hospital?		X		X
How might the laboratory improve communication of value-based initiatives to you?			X	
What barriers do you perceive for laboratory being able to effectively communicate their value-based initiatives?		X		