ESSAYS ON THE ORGANIZATION AND DELIVERY OF CANCER CARE

A Dissertation in
Health Policy and Administration

by

Christopher J. Louis

© 2015 Christopher J. Louis

Submitted in Partial Fulfillment
of the Requirements
for the Degree of

Doctor of Philosophy

May 2015
The dissertation of Christopher J. Louis was reviewed and approved* by the following:

Jonathan R. Clark
Assistant Professor of Health Care Management
Dissertation Advisor
Chair of Committee

Diane Brannon
Professor of Health Policy and Administration

Marianne Hillemeyer
Professor of Health Policy and Administration and Demography
Department Head, Department of Health Policy and Administration

Barbara Gray
Professor Emeritus of Organizational Behavior

Eugene Lengerich
Professor of Public Health Sciences

*Signatures are on file in the Graduate School.
Abstract

This dissertation is comprised of three empirical studies that examine the organization and delivery of cancer care. The first study entitled “Spanning Boundaries: System Dynamics, Externalities, and Patient Navigation,” creates a theoretical framework for why the need for cancer patient navigation has emerged. Using qualitative data to assess cancer patient navigation, we found that navigators commonly functioned in boundary spanning roles and leveraged their social networks to overcome negative externalities in the health system. The second study entitled “The Effects of Organization-level Characteristics on Delays in Breast Cancer Diagnosis: A Population-based Study,” uses a population-based sample of breast cancer patients to assess whether certain types of hospitals diagnose breast cancer in a more timely way than others. These findings suggest that for-profit hospitals and those with comprehensive oncology services had shorter diagnosis delays than their counterparts while system membership and size did not reveal significant differences. The third study included in the dissertation is entitled, “How Structural Design Relates to Attention in Three Health Systems: A Comparative Case Study.” This study uses exploratory evidence from three health systems to understand how the structural design of health care organizations influences where health systems focus their attention. Three distinct foci of attention (tactical-focused attention, patient-focused attention, and provider relationships-focused attention) emerged from the data and provide insights as to how the placement of organizational boundaries (i.e., physician contracting paradigm used, the extent of inter-organizational coordination, clinical structure, and location of breast cancer services) can create situations where an organization’s structural design distributes the focus of attention across different types of issues.
Table of Contents

List of Figures ........................................................................................................................................ v
List of Tables ......................................................................................................................................... vi
Acknowledgements ............................................................................................................................. vii

Chapter 1. Spanning Boundaries: System Dynamics, Externalities, and Patient Navigation .... 1
References ............................................................................................................................................... 28-31

Chapter 2. The Effects of Organization-level Characteristics on Delays in Breast Cancer
Diagnosis: A Population-based Study ................................................................................................. 32
Footnotes ............................................................................................................................................... 52
References ............................................................................................................................................... 53-57

Chapter 3. How Structural Design Relates to Attention in Three Health Systems:
A Comparative Case Study .................................................................................................................. 58
References ............................................................................................................................................... 101-103

Chapter 4. Conclusion .......................................................................................................................... 104
**List of Figures**

Chapter 1 .................................................................................................................................................................................................................................................. 1  
   Figure. The Antecedents and Functional Role of Patient Navigation ........................................... 24

Chapter 2 .................................................................................................................................................................................................................................................. 32  
   Figure. Study Inclusion and Exclusion Criteria ............................................................................. 38

Chapter 3 .................................................................................................................................................................................................................................................. 58  
   Figure. First-order Categories and Second-order Themes ............................................................ 79
List of Tables

Chapter 1 ..............................................................................................................................1
  Table 1. Summary of Key Informants by Informant Type ................................................11
  Table 2. Theoretical Themes and Characteristics ..............................................................13
  Table 3. Average Frequency of Coded Themes by Informant Type ..................................15
  Table 4. Frequency of Coded Themes in Rank Order ......................................................16

Chapter 2 .............................................................................................................................32
  Table 1. Descriptive Characteristics of the Study Sample ................................................42-43
  Table 2. Baseline Regression Results .............................................................................44-45
  Table 3. Regression Results using Propensity Score Matched Sample ..........................46-47

Chapter 3 .............................................................................................................................58
  Table 1. Key Informant Interview Questions by Category ...............................................73-74
  Table 2. Structural Characteristics by Health System ....................................................78
  Table 3. Focus of Attention Types as Referenced by Key Informants by Health System ..............................................................................................................................96
  Table 4. Structural Characteristics by Health System with Focus of Attention ............98
Acknowledgements

“It's what you learn after you know it all that counts.”
~John Wooden~

I am forever grateful to my dissertation committee chair, Dr. Jonathan Clark. His relentless pursuit in challenging my ability to think well beyond my current capacity has undoubtedly transcended this dissertation from a series of empirical studies into a living document with meaning well beyond its boundaries. Moreover, his guidance and concern for my personal happiness proves that he genuinely cares not only for my scholarly advancement, but for my well-being as a person.

“We can complain because rose bushes have thorns, or rejoice because thorn bushes have roses.”
~Abraham Lincoln~

I would like to thank my dissertation committee members, Drs. Brannon, Gray, Hillemeier, and Lengerich, for their overarching lesson that there is much to be learned from people with perspectives that differ from my own. I also express my sincerest appreciation for their countless hours of work, thoughtful feedback, and patience as I navigated this dissertation.

“No man will make a great leader who wants to do it all himself, or to get all the credit for doing it.”
~Andrew Carnegie~

I would like to express my gratitude to Dr. Roger Anderson, the Susan G. Komen Foundation, the Appalachian Regional Council, the National Cancer Institute, and key informants from three unnamed health systems for their support of this dissertation. Their participation and financial support of this research was a critical part of enabling this work to be done.

“You beat cancer by how you live, why you live, and in the manner in which you live.”
~Stuart Scott~

I am eternally grateful to my team of cancer care providers at the University of Florida who cured my Hodgkin’s disease in 2006. Without your skill, compassion, bravery, and unbiased teamwork throughout the course of my care, I would not be here today. Moreover, I may not have found the curiosity and drive to begin and complete this doctoral program.

“The times when you have seen only one set of footprints, is when I carried you.”
~Mary Stevenson~

Most of all, my sincerest appreciation goes to my family. My wife, Erin, my daughter, Adelynn, my son C.J., my mother and father, my brother, Jason, and my four loving grandparents (Grandpa, Papa, Grammy, and Grandma) have carried me with tremendous love, support, patience, and compassion throughout my life and while I pursued one of my loftiest goals yet. I am forever indebted to you for your selflessness and will keep in my heart that above all else, family always comes first…
Chapter 1

SPANNING BOUNDARIES: SYSTEM DYNAMICS, EXTERNALITIES, AND PATIENT NAVIGATION

(This manuscript has been published in the Journal of Oncology Navigation & Survivorship)

Citation
Abstract

**Background:** Patient navigation (PN) has emerged as a possible strategy to bridge gaps, overcome barriers, reduce delays and improve outcomes across the cancer care continuum. However, the literature lacks an explicit theoretical lens through which to view the emergence of patient navigators and the resulting roles they play.

**Purposes:** To view PN through the lens of systems theory and the related theoretical themes of boundary spanning and social networks, and, drawing on these perspectives, to evaluate their usefulness for explaining reported patterns of behavior and to present a framework for understanding PN.

**Methodology:** Non-probability discriminative snowball sampling was used to identify 29 key informants in 6 contiguous Appalachian states. The final sample consisted of 3 groups of informants: health system informants, community-based organization informants, and university-affiliated informants. I used directed content analysis to examine the extent to which patient navigator roles reflect the use of boundary spanning and social networking.

**Findings:** Each group of informants discussed similar themes and characteristics with relative frequency. Patient navigators were found spanning boundaries and using their social networks to overcome negative externalities resulting from a variety of sources. I elaborate on these findings in my theoretical framework.

**Practice Implications:** These findings suggest that cancer patient navigators should build and use their social networks to span boundaries and overcome the negative externalities in the system. This framework suggests that the need for these capabilities among navigators derives from four primary sources—the nature of patient problems, external influences, organizational boundaries, and individual behavior—and how they interact. Addressing the negative externalities associated with these issues reflects an ability to understand and respond to both macro- and micro-level issues across the care continuum. These findings provide insights both for managers attempting to address underlying health system issues and for navigators who desire to be more effective.
Introduction

Coordinating care, overcoming patient, provider, and health system barriers, and reducing delays across the care continuum have been long-standing challenges for health care managers. Recent research suggests that patient navigation (PN) has emerged as a growing organizational and community-based strategy to combat these issues (Wells et al., 2008). Prior research has conceptualized PN programs primarily in terms of the activities patient navigators engage in and the functional roles they play to ensure smooth transitions across the continuum of care (Wells et al., 2008; Parker et al., 2010; Parker & Lemak, 2011). It has been postulated that the value of PN programs may be tied to their ability to fit their approach to the characteristics and complexities of local systems (Parker et al., 2010; Parker & Lemak, 2011). This perspective implies that the emergence of patient navigators is closely tied to the characteristics and complexity of the health system itself. Despite this implication, prior literature lacks an explicit theoretical lens through which to view the emergence of patient navigators and the roles they play.

Simon (1973) has argued that the way organizations are structured and organized may result in “negative externalities” (e.g., miscommunication, errors, barriers, and delays) that arise from the inherent interdependencies that exist between the elements of an often complex system. While part of the administrative task is to minimize these externalities, organizations often fall short, and health care organizations are no exception. Indeed, there are substantial negative externalities that exist throughout health care processes (Vargas et al., 2008; Paskett et al., 2011). Accordingly, patients may benefit from entities that can not only make better sense of the patterns of interdependence across the care continuum, but also bridge gaps and overcome the barriers arising from the complexity of the health care system. Such capabilities are the object of prior research on boundary spanning (Tushman, 1977; Ancona & Caldwell, 1992; Tsai, 2000) and social networking (Shortell & Rundall, 2003; Burt, 2004).
In this study, I view PN through the lens of systems theory and outline the connection between systems theory, boundary spanning, and social networking within the context of cancer care. Further, I evaluate the extent to which these perspectives characterize PN programs. Based on this exploratory evidence, I propose a framework describing both the antecedents of PN programs and the functional roles played by patient navigators.

**Background and Theoretical Framework**

The concept of PN was initially introduced at Harlem Hospital Center in New York City in 1990 as an intervention to reduce inequities in cancer mortality (Freeman, 2004; 2006). Following promising results, which suggested that navigated patients completed a breast biopsy and received a diagnosis in a significantly shorter time than did non-navigated patients, a large and growing number of organizations have employed PN as a strategy to combat various types of cancer and other diseases (Paskett et al., 2011). For example, Wells and colleagues (2008) found that many health care organizations across the United States have instituted PN to minimize delays in breast and cervical cancer diagnosis and treatment, but the paradigms deployed vary greatly from site to site. Meanwhile, national attention has also honed in on PN, and many public (e.g., Centers for Medicare and Medicaid Services; Health Resources and Services Administration) and private (e.g., American Cancer Society, Avon Foundation for Women, Susan G. Komen for the Cure) funding agencies and publicly-traded companies (e.g., Pfizer, Inc.) have allocated resources toward implementing the PN intervention model across the United States (Paskett et al., 2011). Moreover, the Patient Protection and Affordable Care Act (PPACA) has broadly identified PN as a useful strategy to help coordinate services and provider referrals, improve access to health care services through community and organization partnerships, assist patients in overcoming barriers to care, and coordinate patient financial support (H.R. 3590, 2009). Patient navigation networks have also emerged on the national
and local level, serving as conduits for communicating best practices and other successful PN strategies to broader audiences.

**The Role of System Interdependence**

Given that barriers to care as well as poor patient outcomes have long served as the impetus for PN programs, I begin by attempting to explain the system drivers of these problems. While other factors that may be important, I will focus on issues with particular relevance to the organization and delivery of health care services, doing so through the lens of systems theory.

Systems theory—and its practical application in systems thinking (Senge, 1990)—characterizes the complexity of a system based on the extent to which it is "dealing simultaneously with a sizable number of factors which are interrelated into an organic whole" (Weaver, 1948, p. 539). In the US delivery system, such complexity may be seen in the differentiation of providers (e.g., the number of specialties and subspecialties) and provider organizations (e.g., physician groups, hospitals, long term care) and the degree to which they are interdependent. Prior research and my own observations suggest that in health delivery systems such interdependence derives from at least 2 categories of factors: (1) the nature of the patient’s problem to be solved (Clark, 2012), and (2) external influences (Simon, 1973; Tushman & Scanlan, 1981). With respect to the latter, external influences (e.g., regulatory agencies, payment systems, institutional pressures) may complicate relationships across the care continuum. As an example, administered pricing systems (e.g., the diagnosis-related group system) can create payment disparities across service types, impacting the relative profitability of those services (Horwitz, 2005) and creating financial interdependence between service providers. For example, research suggests that obstetric services are generally reimbursed at a level that makes providing these services relatively unprofitable, while the provision of cardiovascular and orthopedic care is generally profitable (Horwitz, 2005). Accordingly, the sustainable provision of obstetric care may depend on coupling it with more profitable services, such as cardiovascular or orthopedics, in
the same organization. Thus, interdependence between otherwise independent service providers (e.g., obstetricians and cardiologists) may derive from influences originating outside the health delivery system.

While such interdependence is real and relevant, it may seem peripheral to the importance of the patient’s problem itself. Patient conditions are often characterized by a high degree of uncertainty and necessitate a substantial degree of interaction between a diverse set of health care providers and other agents, such as physicians, hospitals, and therapists. For instance, cancer manifests itself in patients in varying degrees of severity, with accompanying implications for how treatment will proceed (e.g., surgery, chemotherapy, and radiation therapy) and what specialists and subspecialists will be involved. Moreover, patients with cancer often suffer from multiple comorbidities, requiring coordination across several different medical specialists. These characteristics of the patient’s underlying condition define the problems to be solved and the task of solving these problems generates interdependence between care providers across the continuum of care.

What are the organizational implications of such underlying interdependence? Simon (1973) suggests that, within such interdependent subsystems, any organizational configuration (i.e., division of decision-making responsibilities and labor) “creates externalities that arise out of the interdependencies among the subsystems that are ignored” (pg. 270). While the object is to minimize these negative externalities, organizations often fall short. In health care, these negative externalities may include anything from inconsequential miscommunication, to diagnosis and treatment barriers, to medical errors (iatrogenesis) and even death.

Simon (1973) emphasizes that, because of the underlying interdependencies in the system, the location of organizational boundaries (e.g., between tasks, people, units, and organizations) plays a defining role in the extent of the externalities observed in the system. In addition to organizational
configurations, individual behavior can also serve to exacerbate the boundaries in the system (Ashkenas, 2007). Even under the impossible scenario whereby the perfect organizational configuration exists, behavioral inconsistencies by otherwise interdependent providers may result in poor coordination and barriers to diagnosis and treatment. In short, boundaries placed between otherwise interdependent subsystems—whether by configuration or individual behavior—may compromise the effectiveness and efficiency of their coordinated activities.

It is no wonder that so much of the US health care debate revolves around the location of organizational boundaries, including the extent of specialization (Herzlinger, 1997; Porter and Teisberg, 2006) and the degree of system integration (Enthoven and Tollen, 2005; Enthoven, Crosson and Shortell, 2007). These debates are fueled by the negative externalities in the system (e.g., problems related to cost, quality, access). These externalities—in part derived from the misplacement of organizational boundaries, and in part by individual behavior—may ultimately provide both an explanation for why PN programs exist (i.e., PN as a boundary spanning mechanism) and the capabilities one might expect to find in effective patient navigators.

Boundary Spanning

Consistent with the Simon (1973) perspective on complex systems, empirical work suggests that as system complexity and externalities arise, boundary spanning behaviors become more prevalent (Dollinger, 1984). This idea is intuitive—where there are more boundaries, more boundary spanning will occur. Boundary spanning has been described as a bridging of intra- and inter-organizational boundaries “by individuals who understand…both sides of the boundary, enabling them to search out information on one side and disseminate it on the other” (Tushman & Scanlan, 1981, pg. 291-292). Such boundary spanning behavior is reflected in the work of Parker & Lemak (2011) who suggest that patient navigators play an important role in communicating information that is then used to accomplish individual- and system-level goals. Indeed, such boundary spanning
behavior has been shown to improve organizational performance (Ancona & Caldwell, 1992; Tsai, 2000).

Boundary spanning roles typically incorporate the following 3 characteristics: (1) information selection, processing, translation, and transfer across organizational boundaries, (2) external representation and communication, and (3) internal representation and communication (Aldrich & Herker, 1977; Tushman, 1977; Tushman & Scanlan, 1981). The first characteristic—information selection, processing, translation, and transfer—refers to the full spectrum of cognitive and relational aspects involved in creating knowledge from information and the ability to communicate that knowledge across organizational boundaries (Aldrich & Herker, 1977). The second characteristic—external representation and communication describes “all boundary roles that involve resource acquisition and disposal, political legitimacy and hegemony, and a residual category of social legitimacy and organizational image” among external agents (Aldrich & Herker, 1977, p.220), whereas the third characteristic—internal representation and communication reflects similar boundary roles within one’s own organization (Tushman, 1977; Tushman & Scanlan, 1981).

Social Networking

Research suggests that individuals in boundary spanning roles, such as patient navigators, use their social networks as a conduit for communicating information across internal and external organizational boundaries (Manev & Stephenson, 2001), as described above. Organizations with agents who have networks that bridge structural holes (i.e., separations between non-redundant contacts) have been found to learn faster and adapt quicker to changing circumstances (Burt, 2004). Conversely, boundary spanning activities have also been linked to overcoming structural holes within social networks (Friedkin, 1982). Social networks are, in themselves, subsystems and have been referred to as a sophisticated “…system of objects (e.g., people, groups, organizations) joined by a variety of relationships” (Tichy et al., 1979, pg. 507). Implicit in this definition is the idea that
social networks may span all sides of organizational boundaries. The management of such relationships is essential in enabling the transfer of knowledge between agents (Reagans & McEvily, 2003) and dealing with the complexities and interdependencies inherent in organizations.

Social networks have also been tied to individual and group-level performance (Sparrowe et al., 2001). Inkpen & Tsang (2005) found that establishing more intimate, stable, and long-lasting relationships among agents within a network facilitates knowledge transfer across boundaries, a key component of organizational success. Moreover, Parker and colleagues (2010) suggest that patient navigators are engaged in a range of tasks and behaviors with a variety of agents in their social networks. For example, patient navigators were routinely found to be communicating and integrating information across organizational boundaries between internal and external agents (Parker et al., 2010).

Behavior within social networks typically relates to the following 4 characteristics: (1) network size, or number of contacts in a network, (2) range, or diversity, of contacts, (3) scope of contacts, such as contacts in a single industry or social group, and (4) stability of contacts, which reflects the strength of ties, or the “closeness of social ties,” between agents in a network (Burt, 1982; Shortell & Rundall, 2003; Parker et al., 2010). To this list of network characteristics I add agent behaviors, which relate to “how” agents use their relationships within social networks (Parker et al., 2010).

In the sections that follow, I examine the extent to which the characteristics of boundary spanning and social networks outlined above are observed in PN programs. In doing so, I ask: Do patient navigators serve as integrators, using their social networks to span boundaries and overcome the negative externalities of a complex health system? Or, do patient navigators “simply” represent mechanisms for managing care, ensuring proper utilization of services, and encouraging patient compliance? Although extremely useful, such a role suggests a narrower set of capabilities for PN. In contrast, the theory I have presented suggests a wide ranging role for PN that specifically
necessitates building and capitalizing on social networks that span provider and organizational boundaries to ensure effective and efficient care for patients with cancer.

**Methods**

I examine the emergence of the themes presented in my theoretical framework in interviews about PN among health care providers in Appalachia. Appalachia comprises 420 counties in 13 states, ranging from southern New York to northern Mississippi. This primarily rural, mountainous region is characterized as having high cancer mortality rates (Huang et al., 2002; Yao et al., 2012). Moreover, access to health care services in Appalachia is hindered by complex, fragmented infrastructure (Strover, et al., 2001), inadequate cancer-control strategies (Ward et al., 2006), and a shortage of health care professionals (Behringer et al., 2007). For example, there are only two National Cancer Institute (NCI)-designated comprehensive cancer centers, and many hospitals are small community hospitals that work with independent physicians. In addition, prior research has also suggested that Appalachian residents are unique; Puckett (1992) found that people living in Appalachia are reliant on self, family, and friends, and have trusted relationships with people they know rather than authority figures and highly-trained professionals. The challenges faced by health care providers in Appalachia have spurned the need for a strategy that both effectively manages cancer care processes and understands the needs of local communities.

**Data Collection**

I used non-probability discriminative snowball sampling to identify key informants (Morrison, 1988). In all, I interviewed 29 key informants who reside in 6 contiguous Appalachian states (Kentucky, New York, Ohio, Pennsylvania, Virginia, and West Virginia), and each informant represented 1 of 3 groups: (1) health system informants (n=12), (2) community-based organization informants (n=10), or (3) university-affiliated informants (n=7). Table 1 summarizes key informants by group. Informants within each group represented organizations with and without PN programs.
in place. Informants from organizations with PN programs were either patient navigators themselves or individuals who regularly interacted with the navigator. Informants at sites without PN programs were interviewed because their institution was contemplating a PN program or because they were knowledgeable about PN activity in their local health system. These individuals were included in the sample to provide an objective perspective different from that of those actively performing PN.

**Table 1. Summary of Key Informants by Informant Type**

<table>
<thead>
<tr>
<th></th>
<th>Health System</th>
<th>Community-based Organization</th>
<th>University-affiliated</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of informants</td>
<td>12</td>
<td>10</td>
<td>7</td>
</tr>
<tr>
<td>Number of patient navigators</td>
<td>6</td>
<td>5</td>
<td>0</td>
</tr>
<tr>
<td>Types of organizations</td>
<td>Hospitals &amp; Cancer Centers</td>
<td>Non-profits &amp; Coalitions</td>
<td>Universities</td>
</tr>
<tr>
<td>Informant numbers (order of interviews)</td>
<td>7, 8, 9, 11, 12, 15, 16, 19, 24, 25, 27, 29</td>
<td>6, 14, 17, 18, 20, 21, 22, 23, 26, 28</td>
<td>1, 2, 3, 4, 5, 10, 13</td>
</tr>
</tbody>
</table>

Three study investigators conducted audio-taped, semi-structured telephone interviews (Patton, 1990) between April and October 2010. Interviews began with a grand tour question (Spradley, 1980) broadly addressing PN programs in the informant’s community. Subsequent questions focused on various themes, including the patient navigator’s background and experience, job roles performed by patient navigators, barriers for patient navigators, strategies employed to overcome barriers, community outreach, communication, and champions and gatekeepers of PN programs. Interviews were conducted in an open-ended manner and were not specifically focused on the themes presented in this article; specifically, the terms “boundary spanning” and “social network” (and their related themes) were not explicitly addressed by interviewers. The average
length of the interviews was approximately 60 minutes. Interview protocols are available from the authors on request.

**Analysis Method**

Directed content analysis was used to analyze the interview data for boundary spanning and social network themes. This method of qualitative data analysis “starts with a theory or relevant research findings as guidance for initial codes” (Hsiu-Fang & Shannon, 2005). The analysis process consisted of several steps to ensure reliability and validity. First, I created a pre-determined coding scheme based on the 8 key characteristics of boundary spanning and social networks (Table 2). Next, 2 investigators independently used the pre-determined coding scheme to code five transcripts. In subsequent discussions, they reconciled ambiguous passages or where there was disagreement on codes applied to the interview text and clarified the coding scheme as needed. Then, the same 2 investigators independently coded each of the remaining 24 transcripts. Transcripts were coded using NVivo 9 (QSR International), a computer software package that supports qualitative and mixed methods research. This approach produced an acceptable level of inter-rater reliability, with Cohen’s κ = .82 (Cohen, 1960). Each investigator prepared a short memorandum summarizing his/her findings across the themes (Charmaz, 2006). In total, more than 1,148 coded units were applied to the text of the 29 transcripts. Finally, I performed t-tests to identify statistical significance across informant groups for each characteristic.
Table 2. Theoretical Themes and Characteristics

<table>
<thead>
<tr>
<th>Theoretical Themes &amp; Characteristics</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Boundary Spanning</td>
<td>The bridging of intra- and inter-organizational boundaries “by individuals who understand…both sides of the boundary, enabling them to search out information on one side and disseminate it on the other” (Tushman &amp; Scanlan, 1981, pg. 291-292).</td>
</tr>
<tr>
<td>1. Information selection, processing, translation, &amp; transfer</td>
<td>The full spectrum of cognitive and relational aspects involved in creating knowledge from information and communicating it across organizational boundaries (Aldrich &amp; Herker, 1977).</td>
</tr>
<tr>
<td>2. External representation &amp; communication</td>
<td>“All boundary roles that involve resource acquisition and disposal, political legitimacy and hegemony, and a residual category of social legitimacy and organizational image” among external agents (Aldrich &amp; Herker, 1977, p. 220).</td>
</tr>
<tr>
<td>3. Internal representation &amp; communication</td>
<td>“All boundary roles that involve resource acquisition and disposal, political legitimacy and hegemony, and a residual category of social legitimacy and organizational image” among internal agents (Aldrich &amp; Herker, 1977, p. 220; Tushman, 1977; Tushman &amp; Scanlan, 1981).</td>
</tr>
<tr>
<td>Social Networks</td>
<td>The management of a sophisticated “…system of objects (e.g., people, groups, organizations) joined by a variety of relationships.” (Tichy et al., 1979, pg. 507)</td>
</tr>
<tr>
<td>4. Network size</td>
<td>The number of contacts within a network (Burt, 1982)</td>
</tr>
<tr>
<td>5. Range of contacts</td>
<td>The diversity of contacts within a network (Burt, 1982)</td>
</tr>
<tr>
<td>6. Scope of contacts</td>
<td>The contacts in a single industry or social group (Shortell &amp; Rundall, 2003)</td>
</tr>
<tr>
<td>7. Stability of contacts</td>
<td>The strength of ties, or the “closeness of social ties” between agents in a network (Shortell &amp; Rundall, 2003, pg. 147).</td>
</tr>
<tr>
<td>8. Agent behaviors</td>
<td>“How” agents use their relationships within social networks (Parker et al., 2010).</td>
</tr>
</tbody>
</table>

Findings

Table 3 summarizes the extent to which the interviews across the 3 groups of informants reflected the relevant conceptual characteristics and also identifies statistically significant differences between informant groups. For example, column 9 shows the frequency with which university-affiliated informants discussed information selection, processing, translation, and transfer, external representation...
& communication; and range of contacts and how the frequency significantly differs from informants from community-based organizations. However, the magnitude of this difference is not substantial. Even in the most statistically significant scenario (e.g., information selection, processing, translation, and transfer) where p<.01, university-affiliated informants only referenced this characteristic two more times for every 10 pages of interview text than did informants in community-based organizations. While these differences might reflect differences in professional emphasis, they do not represent systematic divergence in the observed roles of patient navigators. In general, Table 3 shows that when 1 informant group focused on a given characteristic, the other 2 groups focused on the same characteristic with approximately the same frequency. Thus, I present the core findings according to the most frequently discussed characteristics across all three groups, rather than distinguishing between informant groups.

Table 4 presents the overall frequency (from most frequent to least frequent) with which conceptual characteristics were reflected in the informant interviews. From this table, I observe that the top 2 characteristics reflect both boundary spanning (information selection, processing, translation, & transfer) and social networking (agent behaviors), suggesting a close relationship between the 2 in practice. Moreover, while some characteristics appear more frequently than others, in total the overall frequency with which boundary spanning and social networking characteristics were reflected in the interviews was substantial, representing more than 24 mentions for every 10 pages, or nearly 2.5 mentions per page of transcript. I believe this provides some preliminary evidence for the relevance of my framework in that the characteristics of boundary spanning and social networks appear to be highly prevalent in cancer PN. To illustrate further, I provide more descriptive detail from the interviews for the top 4 characteristics; (1) agent behaviors, (2) information selection, processing, translation, and transfer, (3) scope of contacts, and (4) external representation & communication. We also include findings from other characteristics as relevant.
### Table 3. Average Frequency of Coded Themes by Informant Type

<table>
<thead>
<tr>
<th></th>
<th>Health System (n=12)</th>
<th>Community-Based Organization (n = 10)</th>
<th>University-Affiliated (n=7)</th>
<th>P-Value of Differences Between Categories</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(1)</td>
<td>(2)</td>
<td>(3)</td>
<td>(4)</td>
</tr>
<tr>
<td>Total # of Codes Assigned</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total # of Codes Assigned per 10 Pages of Transcript</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Boundary Spanning</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Information selection, processing, translation &amp; transfer</td>
<td>203</td>
<td>87</td>
<td>4.19</td>
<td>53</td>
</tr>
<tr>
<td>External representation &amp; communication</td>
<td>165</td>
<td>65</td>
<td>3.15</td>
<td>50</td>
</tr>
<tr>
<td>Internal representation &amp; communication</td>
<td>52</td>
<td>32</td>
<td>2.64</td>
<td>11</td>
</tr>
<tr>
<td>Sub-total</td>
<td>420</td>
<td>184</td>
<td>3.33</td>
<td>114</td>
</tr>
<tr>
<td>Social Networks</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Network size</td>
<td>36</td>
<td>13</td>
<td>0.66</td>
<td>12</td>
</tr>
<tr>
<td>Range of contacts</td>
<td>143</td>
<td>59</td>
<td>2.92</td>
<td>39</td>
</tr>
<tr>
<td>Scope of contacts</td>
<td>197</td>
<td>81</td>
<td>3.73</td>
<td>66</td>
</tr>
<tr>
<td>Stability of contacts</td>
<td>134</td>
<td>64</td>
<td>3.09</td>
<td>44</td>
</tr>
<tr>
<td>Agent behaviors</td>
<td>218</td>
<td>101</td>
<td>5.02</td>
<td>65</td>
</tr>
<tr>
<td>Sub-total</td>
<td>728</td>
<td>318</td>
<td>3.08</td>
<td>226</td>
</tr>
<tr>
<td>Total</td>
<td>1,148</td>
<td>502</td>
<td>3.20</td>
<td>555</td>
</tr>
</tbody>
</table>

NS indicates not statistically significant
Table 4. Frequency of Coded Themes in Rank Order

<table>
<thead>
<tr>
<th>Characteristics of Theoretical Themes</th>
<th>Number of coded units per 10 pages of transcripts</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agent behaviors</td>
<td>4.49</td>
</tr>
<tr>
<td>Information selection, processing, translation, and transfer</td>
<td>4.13</td>
</tr>
<tr>
<td>Scope of contacts</td>
<td>3.98</td>
</tr>
<tr>
<td>External representation and communication</td>
<td>3.40</td>
</tr>
<tr>
<td>Range of contacts</td>
<td>2.95</td>
</tr>
<tr>
<td>Stability of contacts</td>
<td>2.75</td>
</tr>
<tr>
<td>Internal representation and communication</td>
<td>1.62</td>
</tr>
<tr>
<td>Network size</td>
<td>0.76</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>24.08</strong></td>
</tr>
</tbody>
</table>

Agent Behaviors (Social Networking)

During the interviews, informants discussed agent behaviors more frequently than any other characteristic (4.49 coded units per 10 pages of interview text). Patient navigators were commonly found broadening and using their social networks to overcome barriers to cancer services (i.e., transportation, health insurance), bridge gaps in the health system (i.e., scheduling appointments for cancer services at different organizations, coordinating care) and as one informant stated, “…[to] help navigate patients through the fragmentation” (Informant 19). Informants described various approaches navigators use to perform this role among internal and external agents. The following quote illustrates how one patient navigator initiated and fostered a strong relationship with an external agent:

“Well, I will tell you this: that the most important and the best thing that I ever did when I got this job [as a patient navigator] is I went over to the Social Security office…and I did a presentation to them and told them what I did…As a result of that, two of the workers over at the Social Security office, we formed a kind of a bond, and we got a system going so that all I had to do is when I get a [patient] in my office, I pick up the telephone…they do the interview over the phone…and, bam, it is done and we have done it and gotten patients their [Medicaid] cards within two weeks.” (Informant 26)
Patient navigators were also found to have learned detailed information about patient circumstances and operational processes so that may facilitate patients attending scheduled appointments. For example, one informant discussed how she works with patients as follows, “…you also run into coordination of care issues like helping the patient remember doctor appointments, or schedule doctor appointments, or schedule a scan…Sometimes, I will make the appointment for them or if they are those [types of] patients who have trouble remembering, I will just call them the day before and just say, ‘Don’t forget you have your test or your doctor’s appointment with whomever tomorrow at such and such time.’” (Informant 11)

Another informant described how the patient navigator at her organization leverages her long-standing relationships with internal agents: “So if they [patients] give her [the patient navigator] permission, then she will assist in either ordering additional testing, getting them set up to see a surgeon, or…whatever the patient needs” (Informant 16). Similarly, another informant echoed these sentiments by saying, “…if someone comes in and says they don’t have a PCP for some reason…the navigator will work with them to find someone who is accepting patients that the report can be sent to” (Informant 15). Furthermore, the patient navigator’s connections to alternative health care providers (i.e., physicians, home health agencies, hospice, etc.) provide patients with direct links to resources that they may not have known about. One informant discussed the importance of connecting patients with palliative care providers:

“…we have pulled together a circle of care team…it is increasing the awareness to palliative care and can be for anybody who is going through cancer treatment and isn’t feeling good. And so Dr. B and I have had this discussion and I have started referring people to her…and that has been really successful.” (Informant 27)

Information Selection, Processing, Translation, and Transfer (Boundary Spanning)

Interviews revealed how patient navigators often facilitated the role of information selection, processing, translation, and transfer (4.13 coded units per 10 pages of transcripts). As reflected in the quotes about agent behaviors above, informants frequently described the patient navigator’s role in
gathering, synthesizing, and disseminating cancer-related information, which was used to improve
the quality of care delivered to patients with cancer. For example, one informant stated,

“…I maintain membership within the Oncology Nursing Society, and I am the one
that then brings that information back here and trains the nurses, also lining up
oncology in-services that benefit our IV clinic or nurses on our floors. Most of the
time I find those [in-services] myself, but I also pick up on leads from them on what
they feel like they need help with. So I kind of become their consultative person.”
(Informant 12)

Similarly, another patient navigator discussed how she joined a state-wide networking group to gain
access to new information and resources. In turn, she compared state-wide initiatives with her
organization’s practices in seeking to identify opportunities for improvement.

“…Pfizer drug company had sponsored a navigator workshop, it was one of the first
in the state…I went and learned about a statewide initiative…We then got everyone
into a networking group…they wanted to share resources…to find out well, what are
you doing? Maybe I should be doing something better [at my organization]…”
(Informant 7)

Informants also identified patient navigators as important links between patients with cancer
and their care providers. During a time when patients are inundated with new, cancer-specific
information, patient navigators help patients with cancer formulate key questions to ask but also
Teach them how to interpret the answers. For example, one informant noted,

“…I tell everybody that they [patient navigators] are the missing link. They are that
link that the patient themselves can actually ask, ‘You know, I didn’t understand what
the nurse said, I didn’t understand what the doctor said to me today, and I was afraid
to ask the question.’ What the navigator can do is help them form those questions and
actually write them down for them and, if necessary, attend the next appointment with
them to be able to talk to the provider, because a lot of times… the blood
pressure goes sky high when they come in and they forget what they need to ask…so
I feel like there is a link that helps them [patients] to have the knowledge that they
need to take care of themselves.” (Informant 13)

Likewise, interviews reflected how patient navigators were essential in integrating patient
needs with knowledge of community resources. The ability to (1) extract specific patient needs, (2)
interpret how those needs can be met based on the availability of existing community resources, and
(3) know how to quickly link patients with those resources were identified as valuable skills of the navigator. One informant supported this by saying,

“I think they [patient navigators] definitely, definitely, definitely have to have a knowledge of the resources in the area, more than just the doctors and hospitals available… I don’t believe the navigator has to know all the resources that are available, but how to link them. So there should be a history or experience in working in the community services, an awareness of the resources in the area, because something can come up that has nothing to do with a cancer diagnosis that could prevent the patient from proceeding to the next step… the [patient navigator] needs to be beyond the medical and know the resources for the area.” (Informant 18)

Scope & Stability of Contacts (Social Networking)

Interviews reflected the scope of contacts that patient navigators had within different industries or social groups (3.98 coded units per 10 pages of interview text). Those contacts most commonly referenced were patients with cancer themselves, along with health care organizations and professionals, community-based organizations, churches and other faith-based populations and organizations, and funding agencies. For example, one patient navigator noted how she developed a relationship with the members of local faith-based populations:

“…the last three years I have worked with the Amish and Mennonite population…it took us this long to make inroads, but…we worked very hard to establish a trust and we have been transparent, we have been completely open with them, we promised we would not cross any lines that they did not feel comfortable with us doing. So we pretty much have operated within the cultural realm and not overstepped our boundaries”

(Informant 27)

Many informants also emphasized the importance of strengthening their relationships (stability of contacts) with various agents in their network (2.75 coded units per 10 pages of interview text). Securing trusting relationships with physicians was a common theme in achieving PN program sustainability. To develop stronger ties with the hospital’s medical staff, one patient navigator noted,

“…at first no physician wanted to be involved…[the physician] felt like…if he recommended a mastectomy, that the navigator was going to say [to the patient], ‘Well, do you know about a lumpectomy or do you know you can go have plastic surgery out of town…’ So, we had a huge resistance… We didn’t overcome it until we got a
surgeon…[who] had been part of other patient navigation programs, and he started just working with our navigator and building a rapport. And now, he’s been here for…2 and a half to three years and has about 80% of the breast volume at our center. That’s why [the patient navigators] now see 80% of the breast patients.” (Informant 16)

Moreover, several informants also described how strengthening relationships with internal agents through participation in and the validation of hospital committees was vital to the long term success of PN programs (Informants 11, 15, 16, 19, 24, and 25). While this agent behavior falls under the category of social networking, it also crosses over to internal representation and communication, a key boundary spanning characteristic, and was described as being an important capability in fostering these relationships. For example, one informant noted,

“…I sit on a lot of committees here at the hospital that have nothing to do with my job that are more like employee-based committees—like our service excellence team, our community benefit team—just to kind of keep my face in front of other employees. Because when you are the second-largest employer in the county, your employees know other people who have cancer…so if I am sitting in a meeting across from someone in our accounting office and they say, ‘You know what? I should really have my aunt talk to you, because she was just diagnosed and what a great resource you’d be.’” (Informant 11)

External Representation and Communication (Boundary Spanning)

Interviews revealed external representation & communication as a primary mechanism for maintaining a presence in the community and disseminating information to and from external agents (3.4 coded units per 10 pages of interview text). Informants described how engagement and education of external agents, especially local physicians and their office staffs, are paramount to sustaining the PN program. One informant described his organization’s strategy in maintaining visibility in physician offices:

“One of the things we ask [our patient navigator] to do is visit at least five physician offices per month…And we want her to, you know, talk to the office managers, practice managers, physicians—anyone who will listen about what she is trying to do and what she wants to do.” (Informant 16)
Similarly, another patient navigator discussed how physicians were initially reluctant to embrace the PN program at one hospital because they did not understand its purpose. However, after the navigator collaborated with the medical staff leadership, the community doctors changed their perspective. She described this scenario by acknowledging,

“[Community physicians] didn’t want me talking to patients…they didn’t understand what I would be doing, and that’s where the doctors who are the champions came in, and they really had to explain the process of patient navigation…I also did a presentation at a medical staff meeting for over a hundred physicians, and Dr. G. also presented with me so [community physicians] knew what patient navigation was all about and the value of it to their patients and their practices…I think when they saw me presenting with Dr. G., they knew that it was going to be okay…” (Informant 24)

Several informants also discussed the importance of attending and/or participating in community and general education programs, such as health fairs and speaking engagements (Informants 8, 9, 15, 16, 19, and 25), community health care coalitions (Informants 12, 16), local organization board membership (Informant 11), church groups (Informant 24), and local planning committees (Informant 12). Furthermore, participation in local and national PN network webinars, conferences, and other meeting groups was believed to be a growing avenue in communicating best practices across navigators (Informant 7).

**Summary of Findings**

These findings support the idea that patient navigators play a wide ranging, integrating role, using their social networks to span boundaries in an effort to overcome the negative externalities in the cancer care system. I have argued that such externalities are the result of at least 4 key factors involving provider interdependence. This interdependence—which is determined by (1) the patient’s problem to be solved and (2) external influences, and interacts with (3) organizational configurations and (4) individual provider behavior—helps characterize the extent to which boundaries and barriers exist in the system. The interviews reflected many of these factors. I include a few examples here to
emphasize the important role these factors play in defining the need for PN and the boundary spanning role patient navigators play.

One informant described the nature of the patient problems their regional health system deals as follows:

“a lot of our people in this region put off health care until they can’t anymore, so they don’t access health care until they are symptomatic…After they have been diagnosed with cervical cancer…we also find out they have obesity and heart disease and diabetes.” (Informant 2)

Patient needs were also a common theme. One patient navigator described how patient needs can complicate things (even for navigators):

“So, [the radiation oncologist] brought [a rectal cancer patient] in to me and she left and I said [to the patient] ‘Okay, the doctor told me that she has given you prescriptions.’ He gets in his wallet and he pulls it out, and I bet you there were ten prescriptions in his wallet. [He] hands them to me and says he doesn’t know what to do with these…I typed up very detailed [instructions] on this paper how to get to [the pharmacy] in his area, and he lives right there…I get a call from the group that I was sending him to…and [they] said this man was found in the courthouse clutching your directions…She said everyone in the community knows this family and they are illiterate. Here I had taken all that time and didn’t ask the right questions and it never occurred to me…” (Informant 26)

Another interviewee described how low Medicaid reimbursement rates can affect access to care in their area: “…one of our doctors, an oncologist here, does not take Medicaid, any Medicaid” (Informant 24). This reflects how both external influences and individual provider behavior can influence patient experiences. Finally, another informant revealed that fragmented organizational configurations exist, despite the collective interdependence between the providers:

“Well, we are right now a little fragmented…We are located in some different locations…We are kind of the old structure; we have got medical oncology offices here, which are independent; and you have got radiation oncology, which is a hospital-based department; and we have a new medical oncologist who is coming in to help us build our program, which will also refer a secondary oncologist to work with that person” (Informant 19).
Together, these examples support the idea that the need for patient navigation (i.e., due to the negative externalities) emerges from the interdependence in the system and how it interacts with provider configurations and behavior (Simon, 1973).

**Discussion and Practice Implications**

**Discussion**

The theory and evidence I have presented suggests a strong link between the structure of systems and the use of social networks to span organizational boundaries. These exploratory findings suggest that patient navigators serve an integrating role, building and using their social networks to span boundaries and overcome barriers to care. My theory suggests that such behavior results from negative externalities that emerge from system interdependencies. The Figure depicts these relationships, providing a framework that reflects both why PN emerges (negative externalities) and the roles patient navigators may be expected to play (boundary spanning within social networks). Specifically, this model suggests that a given health system (in this case, the cancer care system) may be characterized by a degree of provider interdependence that emerges both from the environment (external influences) and the object of the system’s existence (the patient’s problem to be solved). Organizational configurations (e.g., differentiation and integration among providers) and individual provider behaviors (e.g., their choices and interactions with others) interact with these interdependencies to produce externalities, both positive and negative. Negative externalities specifically result when configurations and provider behaviors conflict with underlying interdependencies (e.g., the needs of the patient) (Simon, 1973), thus giving rise to the need for boundary spanning. Based on these findings, this model further proposes that boundary spanners (i.e., patient navigators) work to build and capitalize on their social networks to overcome these externalities, theoretically generating positive outcomes for patients.
This framework makes 2 important contributions to our understanding of health systems and the emergence of PN. First, drawing on systems theory, I provide formal insight into how organizational configurations and individual provider behaviors contribute to the problems plaguing the industry. My framework specifies the broad sources of complexity (interdependence, externalities) observed in the health system—(1) the patient’s problem to be solved, (2) external influences, (3) organizational configurations and (4) individual provider behavior—and how exogenous factors (1 and 2) interact with endogenous organizational behavior (3 and 4) to produce the negative outcomes so often observed in the health delivery system. This aspect of my framework is consistent with recent empirical evidence suggesting that the efficiency of certain
organizational configurations depends on the nature of the patient problems being solved (Clark, 2012).

Second, my framework presents PN as an artifact of system dynamics. I specifically integrate theories on social networking and boundary spanning to describe the roles and activities of patient navigators, reflecting an understanding of system dynamics at both a macro level (external influences, organizational configurations) and micro level (patient needs, individual provider behavior, provider interdependence). Systems thinking has been described as “the art of seeing the forest and the trees” and the ability to “act locally and think globally” (Senge, 1990; Clark, et al., 2012). At a macro-level, patient navigators engage in information selection, processing, translation, and transfer to make sense of and adapt to changes in the broader health care landscape, such as changes in payment systems, for example. In doing so, patient navigators often face micro-level challenges associated with the complex relationships between a variety of internal and external agents. These interviews suggest that navigators approached these challenges through agent behaviors and external representation & communication, and that their ability to understand and manipulate their social networks is essential in helping their patients overcome the barriers inherent in the cancer care system.

Study Limitations

Similar to other exploratory studies of this nature, the current study and its conclusions are not without limitations. First, the study sample was small and focused on Appalachia, which may limit the generalizations that may be drawn from the study. Nonetheless, the sample includes a broad range of regions within Appalachia and an array of individuals working in health systems with varying characteristics. Although Appalachia’s substantial rural population, documented high cancer mortality rates and shortage of health care professionals indicate complex circumstances throughout the region, these complicated circumstances are not necessarily unique to this region. While the
specifics may differ across regions, I have no reason to believe that the general antecedents prompting the emergence of PN in Appalachia differ greatly from other regions of the United States. Second, this study was not designed for causal inference, despite my framework specifying causal directions. Given that the intent of this research was to be exploratory and propositional in nature, future research is needed to further understand the relationships displayed in the framework. Finally, because the interview sample includes non-navigators, information bias may be present. It is possible that informants who are not actively participating in navigation duties and are only in observational roles may differ in their perceptions of what navigators do, leading to systematically different responses to similar interview questions. However, the results I present in Table 3 suggest that the magnitude of differences across the informant categories is small. For example, the university-affiliated informant group, which included no navigators, made slightly more references to the characteristics of boundary spanning and social networking than the other informant groups in 5 of the 8 categories (per 10 pages of text). While these differences may reflect a PN knowledge-base by individuals outside of those routinely performing PN, I believe that their inclusion may, in fact, provide a more objective perspective of these programs.

Practice Implications

Despite these limitations, I believe that by specifying the antecedents of PN, this study may offer valuable insights for managers and navigators regarding the role of cancer PN in health delivery systems. The important social networking and boundary spanning capabilities navigators need to traverse the barriers in the system reflect systems-thinking and underscore the relevance of understanding “big picture” issues, aggressively managing social networks, and seeking to bridge gaps between interdependent providers, in addition to performing the tactical duties required of patient navigators (Parker & Lemak, 2011). These capabilities encompass a broader view of the patient navigator role, a more relational role, which involves the mastery of both macro- and micro-
level capabilities. These conclusions have clear implications for selecting and training patient navigators. Despite these implications, however, informants described how current hiring practices were based primarily on less sophisticated means (e.g., training, education, and a candidate’s general interest-level). One informant acknowledged:

“the people that have been historically hired into these [patient navigator] positions were just put there because they have a general interest...Then the organizations re-evaluate and see what problems they were having operationally and fix them from there...That’s how we’ve evolved to focus on the things we do...[Instead] organizations should think strategically and hire based on the capabilities of the person.” (Informant 1).

In moving toward a more focused, capabilities-based hiring process, delivery systems may experience a better fit between the nature of the task and the navigator’s capabilities.

My framework also provides insight for system leaders about system dynamics and the sources of the negative externalities observed in the system, providing leaders with a model for thinking about how to address the underlying causes. Indeed, patient navigation may be viewed as a transaction cost that arises because existing, fragmented organizational configurations leave to markets what may be done more efficiently within organizations (Williamson, 1999). The same observation may be made about other emerging innovations aimed at improving coordination of care and overcoming barriers (e.g., case management). From a system dynamics perspective, these innovations emerge because organizations fail to account for the interdependence between providers. My framework suggests that greater attention to system dynamics on the part of leaders—and more specifically, greater attention to the nature of patient problems and patient needs (Hernandez, et al., 2012)—may lead to improvements in organizational configurations and organizational behavior.
References


THE EFFECTS OF ORGANIZATION-LEVEL CHARACTERISTICS ON DELAYS IN BREAST CANCER DIAGNOSIS: A POPULATION-BASED STUDY
Abstract

Background: The influence of organizational characteristics on delays in breast cancer diagnosis remains poorly understood. The present study provides new insights by using a population-based sample of female Medicare patients diagnosed with breast cancer to examine the effect of several organizational characteristics (ownership, specialized capabilities, system membership, and size) on delays between initial physician-patient consultation or mammography and confirmation of breast cancer diagnosis.

Methods: Study data were derived from the Kentucky, North Carolina, Ohio, and Pennsylvania state central cancer registries (2006-2008). I then linked Medicare enrollment files and claims data (2005-2009), the Area Resource File, and the American Hospital Association Annual Survey of Hospitals to create an integrated data set. I used standard ordinary least squares (OLS) to regress the natural log of breast cancer diagnosis delay on a number of organization-level, demographic, and clinical characteristics. As a robustness check on one of the organization-level variables (ownership), I performed propensity score matching using the nearest neighbor methodology and re-ran an OLS regression on the reduced data sample.

Results: The baseline study sample consisted of 4,547 breast cancer patients enrolled in Medicare. I found that hospitals with for-profit ownership (p<.01) and those with comprehensive oncology services (p<.10) had shorter diagnosis delays than their counterparts. Estimates for system membership and size were not statistically significant at conventional levels.

Conclusions: Some structural characteristics of hospitals (ownership, specialized capabilities) are associated with the degree of delay in diagnosing breast cancer. Researchers must go beyond examining demographic and clinical characteristics to understand timely cancer diagnosis.
Introduction

It has been generally accepted that delays in diagnosing breast cancer are of prognostic concern and may negatively influence risk indicators, such as tumor stage (Arndt et al., 2002) and size (Burgess et al., 1998) at diagnosis, and outcomes such as survival rates (Afzelius et al., 1994; Richards et al., 1999). Although some scholars have debated the strength of this relationship, research has primarily sought to understand delays in terms of racial and ethnic disparities and socio-economic issues (Caplan et al., 1995; Chang et al., 1996; Strzelczyk et al., 2002; Gwyn et al., 2004; Sheinfeld-Gorin et al., 2006; Press et al., 2008). Moreover, while the potential role of health care organizations and systems has been recognized in this body of literature as a potential contributor to diagnostic delays, the specific nature of that role remains poorly understood (Facione, 1993; Bedell et al., 1995; Caplan et al., 1995; Wall et al., 1998; Goodson & Moore, 2002; Wujcik & Malin-Fair, 2008). On a macro level, delays during diagnostic investigations may be attributed to broader organizational inefficiencies that are closely tied to low patient ratings of perceived quality of care or satisfaction from negative experiences (Sanson-Fisher et al., 2009; Paul et al., 2012), amplified psychological issues for patients and families (e.g., stress) (Northouse, 1989; 1994; MacFarlane & Sony, 1992; Poole, 1996; Saegrov & Halding, 2004; Giske & Gjengedal, 2007; Schnur & Montgomery, 2008), and a lack of care coordination (Rittenhouse et al., 2011). However, prior research on this topic has not used frameworks from the organizational sciences to seek new insights on this problem in cancer care (Wujcik & Malin-Fair, 2008).\textsuperscript{15}

The relationship between organizational characteristics and improved health outcomes has been demonstrated across various disease types, including some cancers (Chen et al., 2008), psychiatric diagnoses (Ettner & Hermann, 2001), acute myocardial infarction (Shah et al., 2007), congestive heart failure (Farsi, 2004), and cardiac surgery (Grilli et al., 2007). These relationships suggest that organizations play a critical role in determining the efficacy of health care delivery
processes and point to the potential importance of a number of factors operating at the organizational level. These factors include institutional fields and their accompanying logics (broader social and institutional belief systems that guide and shape organizational and individual behavior) (Friedland & Alford, 1991), organizational experience performing a specific task or set of tasks (Hannan et al., 1989; Birkmeyer et al., 2002), differentiation (segmenting a broader set of organizational systems into subsystems) and integration (combining two or more subsystems to perform a task) (Lawrence & Lorsch, 1967), and scale (organizational size) (Harris et al., 2000). These conceptual issues have been used by researchers in the hospital industry to motivate examinations of the role of hospital ownership, the degree of specialization, the extent of hospital system membership, and hospital size in determining patient outcomes, including quality, efficiency and patient satisfaction.

In the present study, I examined the effect of these organizational characteristics on delays in breast cancer diagnosis, using the number of days that elapsed between the date of a patient’s initial presentation of abnormal breast symptoms (i.e., clinical breast exam (CBE), screening mammography, or diagnostic mammography) and the date of confirmed pathologic diagnosis (hereafter referred to as “diagnosis delay”) (Jenner et al., 2000; Gwyn et al., 2004; Sheinfeld-Gorin et al., 2006; Ferrante et al., 2007; Press et al., 2008; Smith et al., 2008). The objective was to examine whether certain characteristics of the hospital where breast cancer was diagnosed—its ownership structure (e.g., public or private), specialized capabilities, system membership, and size—were related to delays in diagnosis. Study findings advance our understanding of organizational variation in breast cancer diagnosis delays.
Methods

Data Sources

The study design was a secondary data analysis which integrated four cross-sectional data sets. I began by linking two population-based data sources. State central cancer registry (CCR) data on breast cancer incidence for the calendar years 2006-2008 were obtained for all patients living in the Appalachian counties of Kentucky (KY), North Carolina (NC), Ohio (OH), and Pennsylvania (PA). Included in this sample were 167 of the 420, or approximately 40%, of the officially-designated Appalachian counties. Appalachia was selected as the focus for this study because it has been documented as having high cancer mortality rates (Huang et al., 2002; Yao et al., 2012), fragmented infrastructure (Strover et al., 2001), inadequate cancer-control strategies (Ward et al., 2006), and a shortage of health care professionals (Behringer et al., 2007). I linked the CCR data with Medicare enrollment files and claims data for the years 2005-2009, encompassing at least one year before and after the diagnosis date, using three unique identifiers: (1) social security number, (2) gender, and (3) date of birth. Across the two datasets, more than 98% of patients matched exactly on all three of these identifiers. Medicare claims data has been used widely in cancer research because Medicare insures more than 97% of the US population 65 and older and has a high likelihood of having complete claims data for patients not belonging to a health maintenance organization (HMO) (Ballard-Barbash et al., 1996; Warren et al., 2002; Gold & Dick, 2004; Gross et al., 2008; Smith et al., 2011). This linked dataset was also used to identify diagnosis date and the patients’ institutional (hospital) provider. In some cases, patients had claims from multiple hospitals, so the hospital provider was identified as the one with the claim nearest to the diagnosis date. I then joined data from the Area Resource File (ARF) for the years 2006-2008 using county Federal Information Processing Standard (FIPS) codes to include demographic and socio-economic descriptors. Finally, I linked the 2007 American Hospital Association (AHA) Annual Survey of
Hospitals data to incorporate organizational characteristics using the Medicare provider identification number. The 2007 survey data were selected because I used multi-year state CCR were used and Medicare data and the organizational characteristics reported in the AHA survey infrequently change from year-to-year.

Study Sample

**Figure 1** depicts the inclusion and exclusion criteria for the present study. Continuous enrollment in a Medicare fee-for-service (FFS) health plan for the 12 months prior to a diagnosis of breast cancer was required for inclusion in this study. Excluding males (n=1), patients reporting a secondary tumor site to a state CCR (n=1,823), and those with missing data (e.g., tumor characteristics, provider identification number) (n = 1,027), the number of Medicare patients who were diagnosed with breast cancer between January 1, 2006 and December 31, 2008 in KY, NC, OH, and PA was (n=4,957). From this sample, I excluded patients who had a diagnosis delay greater than 180 days (n = 365). This exclusion criteria was applied because it is possible that delays of more than six months may be related to unknown factors, such as a second primary tumor, that are not necessarily germane to the acute instance of breast cancer in question (McLaughlin et al., 2012). The final exclusion criteria was applied to breast cancer patients whose home address at the date of diagnosis was within an Appalachian county of KY, NC, OH, or PA, but were diagnosed at an organization outside of one of those states (n = 45). Thus, the final study sample consisted of 4,547 breast cancer patients.

Variables

**Outcome Variable**

The outcome variable of interest in this study was diagnosis delay. To calculate diagnosis delay, I constructed a time interval (in days) for each patient that began with a patient’s initial breast-related consultation and ended with the date of pathology confirmed diagnosis reported to the state
CCR. The initial consultation date was defined as the date of the first claim for (1) a medical consultation for abnormal breast symptoms, (2) screening mammography, or (3) a diagnostic mammography. Abnormal breast symptoms were identified using Internal Classification of Diseases, 9th Revision (ICD-9) codes 611.71, 611.72, 611.79, and 611.9, while screening and diagnostic mammograms for years 2005 and 2006 were identified using Current Procedural Terminology (CPT) codes 76082, 76083, 76090, 76091, and 76092. Changes in mammography CPT codes for the years

Figure. Study inclusion and exclusion criteria

- Include all patients who were continuously enrolled in a Medicare FFS health plan for the 12 consecutive months prior to a breast cancer diagnosis and who had a home address in an Appalachian county of KY, NC, OH, and PA during 2006-2008 (n = 7,808)
- Exclude males (1 patient)
- Exclude patients who reported a secondary tumor site (1,823 patients)
- Exclude patients with missing data (e.g., tumor characteristics, provider ID number) (1,027 patients)
- Exclude patients with a diagnosis delay greater than 180 days (365 patients)
- Exclude patients with a home address in the Appalachian counties of KY, NC, OH, and PA who were diagnosed outside of one of these states (45 patients)
- Baseline Study Sample (n = 4,547)
- Propensity Score Matched Sample Based on For-profit Ownership (n = 205)
- Exclude patients who were not matched based on Propensity Score analysis using Nearest Neighbor Matching Methodology (n = 4,342)
2007–2009 prompted the use of codes 77051, 77052, 77055, 77056, and 77057 for those years. Moreover, in all years I searched for these mammography codes in conjunction with a corresponding diagnosis code of V76.11 or V76.12 to ensure the capture of all screening and diagnostic mammography claims. To complete the diagnosis delay time interval, I calculated the difference between the patient’s initial breast consultation and the diagnosis date reported to the state CCR. All patients included in the sample had a diagnosis date.

*Organization-level variables*

Organizational characteristics (for-profit ownership, whether the hospital provides comprehensive oncology services, system membership, and hospital size) were derived from hospital responses to the 2007 AHA Annual Survey of Hospitals. I created binary variables for for-profit ownership (hospitals owned by private investors), hospitals that provide comprehensive oncology services (encompassing screening, diagnostic, and treatment modalities), and hospitals that are members of multi-hospital health systems (2 or more hospitals affiliated with the same parent organization). Hospital size, measured by the number of total inpatient admissions for a hospital, was included as a continuous variable.

*Patient-level variables*

Patient socio-demographic characteristics (race, age, marital status, diagnosis year, diagnosis quarter, diagnosis state, patient ZIP code of residence at diagnosis date, median income of county of residence) were derived from state CCRs, Medicare enrollment files and claims data, and the ARF. Race was categorized into white and African American. Very small sample sizes (<1%) for all other races (e.g., Alaska Native, American Indian, Asian Americans, or Pacific Islanders) and ethnicities (e.g., Hispanic) prevented analysis in the present study (McLaughlin et al., 2012). Marital status was categorized into married (or member of a domestic partnership) and not married (single, divorced/separated, or widowed). Diagnosis quarter, or the quarter of the calendar year when a
diagnosis was made, was included to account for seasonal variation as Appalachia’s mountainous
terrain and periods of prolonged inclement weather may be a contributing factor to diagnosis delay.
I also categorized a patient’s ZIP code of residence at the date of diagnosis into metropolitan and
non-metropolitan based on the US Office of Management and Budget (OMB) designations (OMB,
2003). Median income for the patient’s county of residence at the date of diagnosis was included as a
continuous variable.

Tumor-specific characteristics (American Joint Committee on Cancer consolidated cancer
stage, lymph node involvement, presence of a sentinel lymph node, hormone receptor status) were
obtained from state CCR data. Breast cancer stage at diagnosis was segmented into four categories:
*in situ* (tumor confined to its site of origin), localized (primary site only with no lymph node
involvement), regional (regional lymph node involvement or directly beyond the primary tumor site),
or distant (metastasized). Lymph node involvement was categorized into no level I/II AD and level
I/II AD. The presence of a sentinel lymph node was also accounted for (No/Yes). Hormone
receptor status (based on data for estrogen receptor (ER) and progesterone receptor (PR) statuses)
of a tumor was categorized into one of four groups: (1) positive, if ER or PR positive, (2) negative, if
ER and PR negative, (3) borderline, and (4) undetermined/unknown. Human epidermal growth
factor receptor 2 (HER2) status data were not available. Tumor size was omitted from the analysis
due to an abundance of missing data.

A Deyo version (Deyo et al., 1992) of the Charlson co-morbidity index was calculated for
each patient using Medicare claims data. This 18-comorbidity index assesses the extent to which
patients diagnosed with cancer are affected by other diseases as well. Since cancer is the disease of
interest in this study, it is not included in the co-morbidity index. Co-morbidity burden was assessed
for the period of one year prior to the date of breast cancer diagnosis through one month prior to
the diagnosis date.
Statistical Analyses

Descriptive statistics (mean, standard deviation) were provided to assess the distribution of patients within the study sample in terms of the covariates. I then analyzed a baseline linear regression model using standard ordinary least squares (OLS) to regress diagnosis delay on a set of organization-level and demographic variables. I took the natural log of the outcome variable, diagnosis delay, to ensure that the error term of the model was more likely to approximate a normal distribution. Moreover, I accounted for heteroscedasticity and clustering of patients receiving care at the same hospital, or the relatedness of observations, by clustering the standard errors by hospital. Tests for co-linearity revealed no problematic relationships between independent variables. Statistical significance of regression coefficients were assessed using t-tests.

Because statistically significant differences were detected in the baseline regression model and the sample size of for-profit hospitals (a key explanatory variable) was relatively small, I elected to test the robustness of the findings with respect to ownership. A propensity score analysis using the nearest neighbor matching methodology was conducted in order to ensure comparability between treated observations (i.e., patients diagnosed with breast cancer in for-profit hospitals) and controls (Battaglia et al., 2006). More specifically, each patient diagnosed with breast cancer at a for-profit hospital was matched with a patient having similar organizational (system membership, hospital size) and demographic (race, age, marital status, diagnosis year, diagnosis quarter, diagnosis state, patient ZIP code of residence at diagnosis date, median income in county of patient residence, number of co-morbid conditions, cancer stage at diagnosis, lymph node involvement, presence of a sentinel lymph node, hormone receptor status) characteristics, but who was diagnosed at a non-profit hospital. I then re-ran the baseline linear regression model using the matched sample and assessed statistical significance of the regression coefficients with t-tests. Analyses were carried out using Stata statistical software (release 12, StataCorp, 2011).
Results

Descriptive Findings

Table 1 reports organization-level, demographic, tumor, and morbidity characteristics for the patients included in the study (n=4,547). In terms of the organization where breast cancer was diagnosed, two percent of patients were diagnosed at a for-profit hospital. Seventy-nine percent of patients were diagnosed at a hospital that reported providing comprehensive oncology services and 42% percent were diagnosed at a hospital that was a member of a health system. The mean hospital size in the study had an inpatient admission total of 14,617 during 2007. Table 1 also demonstrates that the majority (96%) of women in this study were white. This high proportion of white women with breast cancer is consistent with prior Appalachia research (Paskett et al., 2011). Sixty-three percent of women lived in a metropolitan area. Thirty-nine percent of women had 3 or more co-morbid conditions, while slightly more than half (52%) were diagnosed with local stage breast cancer.

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Mean</th>
<th>Standard Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Organizational Characteristics of Hospitals</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>For-profit Ownership</td>
<td>0.024</td>
<td>0.152</td>
</tr>
<tr>
<td>Hospital Provides Comprehensive Oncology Services</td>
<td>0.785</td>
<td>0.411</td>
</tr>
<tr>
<td>System Membership</td>
<td>0.420</td>
<td>0.494</td>
</tr>
<tr>
<td>Hospital Size (Number of Admissions)</td>
<td>14,617</td>
<td>12,355</td>
</tr>
<tr>
<td><strong>Patient Demographic Characteristics</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Race</td>
<td></td>
<td></td>
</tr>
<tr>
<td>White</td>
<td>0.963</td>
<td>0.190</td>
</tr>
<tr>
<td>African American</td>
<td>0.037</td>
<td>0.190</td>
</tr>
<tr>
<td>Age</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt; 65</td>
<td>0.086</td>
<td>0.281</td>
</tr>
<tr>
<td>65-74</td>
<td>0.406</td>
<td>0.491</td>
</tr>
<tr>
<td>75-84</td>
<td>0.381</td>
<td>0.486</td>
</tr>
<tr>
<td>85+</td>
<td>0.126</td>
<td>0.332</td>
</tr>
<tr>
<td>Marital Status</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Married</td>
<td>0.453</td>
<td>0.498</td>
</tr>
<tr>
<td>Not Married</td>
<td>0.547</td>
<td>0.498</td>
</tr>
<tr>
<td>Diagnosis Year</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2006</td>
<td>0.347</td>
<td>0.476</td>
</tr>
<tr>
<td>2007</td>
<td>0.336</td>
<td>0.472</td>
</tr>
</tbody>
</table>
Baseline Regression Results

Table 2 reports the coefficients and standard errors from the baseline linear regression model (n=4,547). Based on the coefficients for the organization-level variables, the estimates suggest that relative to non-profits patients diagnosed with breast cancer at for-profit hospitals (p<.01) were diagnosed in nearly half the number of days (10 days versus 17 days). Hospitals that provided comprehensive oncology services (p<.10) also had a statistically significant shorter
diagnosis delay than hospitals not providing comprehensive oncology services (17 days versus 19 days, respectively). However, no statistically significant differences were noted among the other key organizational variables: system membership and hospital size. In terms of the demographic variables included in the model, the estimates suggest that women 85+ had the longest diagnosis delay (p<.01). Women diagnosed with breast cancer in 2008 (p<.10) experienced longer diagnosis delay than women diagnosed in 2006 and 2007. Moreover, coefficients for the quarterly indicators suggest some seasonality in diagnosis delay. Among cancer stages, local (p<.05) and regional disease (p<.05) had longer diagnosis delays.

Table 2. Baseline Regression Results

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Coefficient</th>
<th>Standard Error</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Organizational Characteristics of Hospitals</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>For-profit Ownership</td>
<td>-0.51a</td>
<td>0.17</td>
</tr>
<tr>
<td>Hospital Provides Comprehensive Oncology Services</td>
<td>-0.1c</td>
<td>0.06</td>
</tr>
<tr>
<td>System Membership</td>
<td>0.02</td>
<td>0.05</td>
</tr>
<tr>
<td>Hospital Size (Number of Admissions)</td>
<td>0</td>
<td>0.00</td>
</tr>
<tr>
<td><strong>Demographic Characteristics</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Race</td>
<td></td>
<td></td>
</tr>
<tr>
<td>White</td>
<td>0.17</td>
<td>0.11</td>
</tr>
<tr>
<td>African American Referent</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt; 65</td>
<td>0.1</td>
<td>0.08</td>
</tr>
<tr>
<td>65-74</td>
<td>Referent</td>
<td></td>
</tr>
<tr>
<td>75-84</td>
<td>-0.24</td>
<td>0.05</td>
</tr>
<tr>
<td>85+</td>
<td>0.19a</td>
<td>0.07</td>
</tr>
<tr>
<td>Marital Status</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Married Referent</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Not Married</td>
<td>-0.05</td>
<td>0.05</td>
</tr>
<tr>
<td>Diagnosis Year</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2006 Referent</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2007</td>
<td>0.05</td>
<td>0.05</td>
</tr>
<tr>
<td>2008</td>
<td>0.1c</td>
<td>0.05</td>
</tr>
<tr>
<td>Diagnosis Quarter</td>
<td></td>
<td></td>
</tr>
<tr>
<td>January-March Referent</td>
<td></td>
<td></td>
</tr>
<tr>
<td>April-June</td>
<td>0.15a</td>
<td>0.06</td>
</tr>
<tr>
<td>July-September Referent</td>
<td>-0.02</td>
<td>0.06</td>
</tr>
<tr>
<td>October-December Referent</td>
<td>0.02</td>
<td>0.06</td>
</tr>
<tr>
<td>Diagnosis State</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Kentucky Referent</td>
<td></td>
<td></td>
</tr>
<tr>
<td>North Carolina</td>
<td>-0.09</td>
<td>0.13</td>
</tr>
<tr>
<td>Ohio</td>
<td>-0.24</td>
<td>0.16</td>
</tr>
<tr>
<td>Pennsylvania</td>
<td>-0.08</td>
<td>0.13</td>
</tr>
</tbody>
</table>
### Metropolitan Non-metropolitan

| Median Income in County of Patient Residence | 0 | 0.00 |

| **Tumor/Cancer Characteristics** |  |
| Cancer Stage at Diagnosis |  |
| in situ | 0.14 | 0.11 |
| Local | 0.19<sup>b</sup> | 0.09 |
| Regional | 0.23<sup>b</sup> | 0.10 |
| Distant | Referent |  |
| Lymph Node Involvement |  |
| Level I/II AD | Referent |  |
| No Level I/II AD | 0.02 | 0.04 |
| Sentinel Lymph Node |  |
| No | Referent |  |
| Yes | 0.13 | 0.15 |
| Hormone Receptor Status |  |
| Positive | -0.36 | 0.23 |
| Negative | -0.28 | 0.24 |
| Borderline | Referent |  |
| Undetermined/Unknown | -0.39 | 0.25 |

| Morbidity Indicators |  |
| Number of Co-morbid Conditions |  |
| 0 | Referent |  |
| 1 | -0.07 | 0.06 |
| 2 | -0.06 | 0.07 |
| 3+ | -0.06 | 0.05 |

<sup>a</sup>p < .01  
<sup>b</sup>p < .05  
<sup>c</sup>p < .10  
<sup>d</sup>Regression includes a constant, which is not reported.

---

**Regression Results using Propensity Score Matched Sample**

Table 3 reports the coefficients and standard errors from the regression results using the propensity score matched sample (n=205), carried out as a robustness check on the for-profit ownership findings in Table 2. Based on the coefficients, the estimates from the propensity score model suggest that relative to non-profits patients diagnosed with breast cancer at for-profit hospitals had a statistically significant (p<.05) shorter diagnosis delay (16 days versus 26 days). I note hospitals that provided comprehensive oncology services (p<.05) continue to demonstrate a statistically significant shorter diagnosis delay in the matched sample.<sup>c</sup> Consistent with the base analysis, statistically significant differences were not detected for system membership or hospital size. In terms of the demographic variables included in the model the estimates suggest that women
ages 75-84 (p<.05) and 85+ (p<.05) had a shorter diagnosis delay. Women diagnosed with breast cancer in 2007 (p<.05) experienced a shorter diagnosis delay than those diagnosed in other years studied, while women diagnosed from October-December (p<.05) had a longer diagnosis delay. Further, women with co-morbid conditions in this model had a statistically significant shorter diagnosis delay than those without a co-morbid condition. More specifically, women with 1 co-morbidity (p<.01), 2 co-morbid conditions (p<.10), and 3 or more co-morbid conditions (p<.10) all had statistically significant shorter diagnosis delays than women with no co-morbid conditions.

Several differences were noted between the baseline regression model and the propensity score matching regression model. Following analysis using the reduced data sample, I observed changes in the level of significance and/or direction among some of the organization-level and demographic variables including ownership status, hospitals providing comprehensive oncology services, age, diagnosis year, diagnosis quarter, the number of co-morbid conditions, and cancer stage.

**Table 3. Regression Results using Propensity Score Matched Sample**

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Coefficient</th>
<th>Standard Error</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Organizational Characteristics of Hospitals</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>For-profit Ownership</td>
<td>-0.48b</td>
<td>0.21</td>
</tr>
<tr>
<td>Hospital Provides Comprehensive Oncology Services</td>
<td>-0.58b</td>
<td>0.24</td>
</tr>
<tr>
<td>System Membership</td>
<td>-0.12</td>
<td>0.43</td>
</tr>
<tr>
<td>Hospital Size (Number of Admissions)</td>
<td>0</td>
<td>0.00</td>
</tr>
<tr>
<td><strong>Demographic Characteristics</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Race</td>
<td></td>
<td></td>
</tr>
<tr>
<td>White</td>
<td>0.45</td>
<td>0.36</td>
</tr>
<tr>
<td>African American Referent</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt; 65</td>
<td>0.07</td>
<td>0.29</td>
</tr>
<tr>
<td>65-74</td>
<td>Referent</td>
<td></td>
</tr>
<tr>
<td>75-84</td>
<td>-0.38b</td>
<td>0.18</td>
</tr>
<tr>
<td>85+</td>
<td>-0.72b</td>
<td>0.34</td>
</tr>
<tr>
<td>Marital Status</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Married Referent</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Not Married</td>
<td>0.23</td>
<td>0.19</td>
</tr>
<tr>
<td>Diagnosis Year</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2006 Referent</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2007</td>
<td>-0.43c</td>
<td>0.24</td>
</tr>
</tbody>
</table>
Diagnosis Quarter
- January-March: Referent
- April-June: 0.21
- July-September: 0.12
- October-December: 0.57

Diagnosis State
- Kentucky: Referent
- North Carolina: -0.35
- Ohio: -0.31
- Pennsylvania: -0.27

Patient ZIP Code of Residence at Diagnosis Date
- Metropolitan: Referent
- Non-metropolitan: 0.25

Median Income in County of Patient Residence
- 0

Tumor/Cancer Characteristics

Cancer Stage at Diagnosis
- in situ: -0.55
- Local: -0.14
- Regional: -0.1
- Distant: Referent

Lymph Node Involvement
- Level I/II AD: Referent
- No Level I/II AD: -0.19

Sentinel Lymph Node
- No: Referent
- Yes: (omitted)

Hormone Receptor Status
- Positive: 0.13
- Negative: (omitted)
- Borderline: Referent
- Undetermined/Unknown: -0.14

Morbidity Indicators

Number of Co-morbid Conditions
- 0: Referent
- 1: -1.26
- 2: -0.64
- 3+: -0.5

Discussion

These findings indicate that organizations may play an important role in diagnosis delay among women with breast cancer. First, the findings support the idea that for-profit hospitals may be more efficient in diagnosing patients than their counterparts. Prior work on hospital ownership
suggests that these findings may reflect a unique institutional logic specific to for-profit hospitals (Friedland & Alford, 1991; Thornton & Ocasio, 2008). In particular, the market-oriented logic of for-profit hospitals may function as a driver of efficiency, productivity, and increased sensitivity to customer demand (e.g., patients desire a timely diagnosis), while non-profit and government hospitals may place greater emphasis on community-based or politically-oriented objectives. Prior research on hospital efficiency supports this idea and has identified a strong relationship between investor-owned hospitals and greater efficiency (Dranove & Lindrooth, 2003; Sari, 2003; Clark, 2012).

The findings with respect to for-profit status may also reflect, to some degree, the resources of large health systems. In a more detailed examination of the for-profit hospitals in this study, I observed that the vast majority are members of multi-state health systems comprised of more than 48 hospitals. More specifically, of the 28 for-profit hospitals in this study, 22 (79%) were members of health systems with more than 48 hospitals. By contrast, 54% of the non-profit hospitals in this study were not members of a health system. Moreover, of those non-profit hospitals that were part of a health system, 78% were in systems with fewer than 15 hospitals. Large, nationally integrated health systems may come with advantages not available to stand-alone facilities or even small local systems. These may include access to capital; management expertise; and the learning benefits associated with in-system information sharing and knowledge transfer. Future research is needed to examine how these issues relate specifically to diagnosis delay.

The second key finding in this study suggests that hospitals providing comprehensive oncology services achieve shorter diagnosis delays. Two related issues may be at work here: (1) the organizational integration of specialized, yet interdependent tasks, and (2) the level of experience the organization has in performing this set of interrelated tasks (e.g., prevention, breast cancer screening, diagnosis, treatment, etc.). The organizational integration of the necessary components of oncology
care may facilitate more rapid progression through each phase of the care continuum, including the diagnostic phase. Moreover, the visible presence of these specialized capabilities within the organization may direct greater organizational attention to the resources, rules, and relationships involved in diagnosing breast cancer (Ocasio, 1997) and result in better cross-unit coordination (Lorsch & Lawrence, 1965).

These findings advance the literature on diagnosis delay by providing an organizational perspective on the diagnostic process. Specifically, they support the notion that organizational characteristics are related to differences in diagnosis delay. In a recent literature review examining the barriers to diagnostic resolution after abnormal breast symptoms, Wujik & Malin-Fair (2008) found that very few studies have evaluated provider and system influences. Of those scholars that studied provider and system delays, this review concluded that past studies were focused primarily on communication (e.g., physician communication) and process (e.g., delays in scheduling, lack of operating room access) barriers. Thus, this study contributes a needed perspective by shedding light on the broader context within which diagnosis delays occur.

**Study Limitations**

This study has several limitations. First, I may be limited in my ability to generalize the results of this study to the broader US population of women with breast cancer as it includes only the Appalachian counties of 4 states. Characterized as having a large proportion of rural areas (Appalachian Regional Commission, 2013), higher cancer mortality rates (Huang et al., 2002; Yao et al., 2012), fragmented infrastructure (Strover et al., 2001), and a shortage of health care providers (Behringer et al., 2007), Appalachia exhibits some attributes that may differentiate it from other areas of the US. However, since this study incorporates approximately 40% of the Appalachian counties and is population-based, I argue that these findings are likely generalizable to the 420 federally-designated Appalachian counties. A second limitation stems from the use of Medicare claims data.
This data source includes predominantly patients 65 and older, and thus, may not represent breast cancer diagnosis delay among younger patients, those with no or few co-morbidities, or those covered by different insurance types. Nevertheless, from 2006-2008 nearly half (42.4%) of US women with breast cancer were 65 and older (Centers for Disease Control and Prevention, 2011) and prior scholars have demonstrated that Medicare volumes are highly correlated with overall volumes (Begg et al., 1998; Bach et al., 2001; Bianco et al., 2005; Keating et al., 2009). Third, this study may be limited in that while I focused on hospital providers, there may be other outpatient facilities or individuals involved in the diagnostic process, the characteristics of which I am unable to measure. However, the existence of these providers may reflect the ability of hospitals to coordinate care with each of these other entities. For example, consider that a patient may elect to use a freestanding outpatient imaging center for mammography and ultrasound testing, while opting to have the more complex diagnostic testing (e.g., biopsy, pathology, etc.) performed at a hospital. In this scenario, the hospital must lead and coordinate a process for retrieving the results of all imaging studies conducted at the outpatient imaging center prior to proceeding with a biopsy or other testing. Finally, while there is interest in understanding causal processes related to delays in breast cancer diagnosis, the statistical analysis used in this study is limited to making inferences about association. Nonetheless, the relationships identified in this study provide an evidence base that can be used to create studies using primary data that may determine causality.

Conclusion

Despite these limitations the findings are novel and important to our understanding of the underlying issues related to breast cancer diagnostic delays. Specifically, this study points to the importance of organizational characteristics (specifically, for-profit ownership and specialized capabilities) and advances our conceptual and empirical understanding of the role these characteristics play in diagnostic delays. This study also supports the notion that the breast cancer
research community must go beyond examining demographic and clinical characteristics to understand why some patients are diagnosed more expeditiously than others. Diagnosis is a process of allocating resources to patients and organizations are at the center of that process. These findings suggest that improving our understanding of how those resources are organized (resulting from specific ownership types or the scope of oncology services offered) in order to improve process efficiency may provide helpful insights in minimizing diagnosis delays.
Footnotes

\textsuperscript{a} I conducted a sensitivity analysis on the baseline regression model that included an independent variable controlling for the number of providers a patient had claims for during the diagnostic process and no notable differences were identified.

\textsuperscript{b} I conducted a subsequent outlier analysis of patients with a diagnosis delay greater than 180 days and no notable differences were identified.

\textsuperscript{c} The number of days for this variable is not reported as the propensity score analysis was performed as a robustness check on the for-profit variable.

\textsuperscript{d} The study inclusion and exclusion criteria were adapted from McLaughlin et al., 2012.


Warren JL, Klabunde CN, Schrag D et al. (2002). Overview of the SEER-Medicare data: content, research applications, and generalizability to the United States elderly population. Medical Care, 40(8 Supplement IV), 3-18.


Chapter 3

HOW STRUCTURAL DESIGN RELATES TO ATTENTION IN THREE HEALTH SYSTEMS: A COMPARATIVE CASE STUDY
Abstract

Background: Some scholars have suggested that the design of organizations can play an important role in determining how attention and effort are distributed within firms. However, our understanding of how existing organizational structures focus or divert attention in health care is limited.

Purpose/Methodology: I view breast cancer care delivery efforts through the lens of organization design and the attention-based view of the firm. More specifically, I use exploratory evidence from comparative case studies of three health systems to help us understand how the placement of organizational boundaries relates to where organizations focus their attention. Non-probability discriminative snowball sampling was used to identify my final sample of key informants and I employed a grounded approach to analyzing and interpreting the interview data.

Findings: I found variation across the three health systems in terms of where organizational attention was primarily focused. More specifically, each organization was categorized into one of three distinct foci of attention types (tactical-focused attention, patient-focused attention, and provider relationship-focused attention) that manifested themselves via the specific issues discussed by key informants from each health system.

Conclusions: Study findings suggest that the placement of organizational boundaries (i.e., physician contracting paradigm used, the extent of inter-organizational coordination, clinical structure, and location of breast cancer services) can create situations where an organization’s structural design distributes the focus of attention across different types of issues. Moreover, having a “one-stop shop,” where all services are provided in a single location doesn’t appear to be a necessary, or even sufficient, means to having a patient-centered structural orientation.
Introduction

Scholars have suggested that the design of organizations can play an important role in determining how attention and effort are distributed within firms (Ocasio, 1997). From this perspective, organizational leaders have a central role to play in ensuring that the organization’s relational structure (and implicit boundaries) distribute sufficient attention to the processes, procedures, and relationships necessary to facilitate the achievement of desired outcomes (Ocasio, 1997). Moreover, head-scratching challenges can arise when health care organizations disregard critical interdependencies (Simon, 1973) in establishing boundaries among patients and providers. Despite the relevance of such a perspective for a fragmented health care delivery system, our understanding of how existing structures focus or divert attention in health care is limited.

In this paper, I explore how such challenges arising from structural inconsistencies relate to the “issues, answers and decision-makers” (Ocasio, 1997) demanding the attentional capacities of health care organizations. I use exploratory evidence from three comparative case studies of the breast cancer care services offered by three health systems to help understand how attention is distributed. My analysis of these cases suggests a clear correspondence between structure and attention, revealing three distinct structural designs matched with three dominant attentional orientations (tactic-focused, patient-focused, provider relationship-focused). Moreover, my findings with respect to the distribution of patient-focused issues across cases are suggestive of how and why certain structural features can focus or divert attention from the needs of patients, providing important insights for health system executives and physician leaders struggling to deliver patient-centered care.

Literature Review

Focusing Organizational Attention
Organizational attention has been defined as the “socially structured pattern of attention by decision-makers within an organization” (Ocasio, 1997, p.188). The key insight this concept offers is, it is necessary to understand how the organization focuses the attention of its decision-makers in order to understand the behavior of its members. This argument is based on the following three theoretical principles that motivate the concept of organizational attention: (1) Focus of Attention—decision-makers actions are based on where their attention is focused, (2) Situated Attention—decision-makers actions are based on the particular context they find themselves in, and (3) Structural Distribution of Attention—the context decision-makers find themselves in is based on the structure of the organization with respect to “how the organization distributes and controls the allocation of issues, answers, and decision-makers within specific firm activities, communications, and procedures” (Ocasio, 1997, p.191).

In this context, organizational design choices may be critical because the placement of boundaries has implications for where organizational attention gets directed. Herbert Simon (1973) would further argue that when decision-makers do not place boundaries in the most effective manner, externalities result in inefficiencies. Recent research on this topic has also found that when management teams are faced with many different options (e.g., goals, strategic options) from which to choose (called “crowding”); they can only focus on a subset of those options (Dahlander & Piezunka, 2014). In many cases, despite efforts to elicit suggestions and strategic recommendations from a number of stakeholders, decision-makers will ultimately narrow their attention by resorting back to, and placing greater weight on, familiar and easily-accessible options. However, other researchers have found that through the acquisition of experience, decision-makers can learn to broaden their attentiveness to a wider range of options (Dane, 2013). These topics are important to decision-making as attention structures (e.g., resource availability) have a significant influence on goal selection and achievement (Stevens et al., 2014). The implication of this finding is that
organizational decision-makers must have had exposure to a sufficient amount of industry knowledge to transcend the structural imperative and focus their attention on the appropriate organizational goals and practices that best serve patient needs.

The implication of this research is that because of organizational design, decision-makers may garner a limited perspective when deciding which organizational strategies are most important. In some cases, the placement of organizational boundaries may be artifacts of prior leaders, a lack of innovation, a paucity of resources, or attempts to create efficiency. Consequently, existing organizational boundaries are likely to direct attention toward certain organizational activities (tasks, goals, objectives, etc.) that address some past organizational interdependencies but may miss other critical ones.

Organizational Attention in Health Care

Organizational attention has received limited attention in the health services literature. Some recent research has used organizational attention to understand how hospitals direct attention toward certain activities during periods of re-accreditation. Towers & Clark (2014) found that improved mortality rates were experienced by hospitals during close temporal proximity to their Joint Commission accreditation site visit. The implication of this finding is that during the time windows when site visits were expected, greater organizational attention may have been focused on Joint Commission standards; many of which are aimed at improving quality and reducing clinical errors, but such a focus was short-lived and quality outcomes returned to their previous state after the Joint Commission survey.

Gaps in the Extant Literature Addressed by the Current Study

Given the paucity of research in this field using the theoretical principles (focus of attention, situated context, structural distribution of attention) of the attention-based theory of a firm, I provide a new lens through which to view how (and why) health care decision-makers direct
attention. I then use this lens to help understand the issues found at multiple health systems in delivering breast cancer care. The conceptual relationship I have identified contributes to and enhances our understanding of how organizational attention relates to the placement of organizational boundaries. Organizational attention is needed in this context to help explain how the design of organizational boundaries may shape the rules, resources, and objectives of individuals working across these boundaries and, in turn, how ineffective structural design diverts attention from the organization’s primary focus area(s) creating negative externalities.

**Designing Organizational Boundaries**

Organizational boundaries have been defined as “imagined lines drawn to separate the organization from its surrounding environment and to specify how internal roles and functions are related but separated from one another” (Fiol, 1989, p. 273). Scholars espousing the knowledge-based theory of a firm (KBT) (Grant, 1996), help us understand how the placement of organizational boundaries and can influence where organizations focus their attention. The knowledge-based theory of a firm emerged from the idea that organizations are valuable not only because they avoid transaction costs (Williamson, 1981), but also because they can capitalize on their most important resources (e.g., specialized knowledge) which is the most important strategic resource a firm can use in achieving a competitive advantage (Grant, 1996).

The KBT proposes that the placement of organizational boundaries should be based on the firm’s most specialized knowledge. Decisions about how to structure the organization, and determination of with whom to partner and with whom to compete—should be made to augment the organization’s most strategic resources and gain a competitive advantage in the marketplace. The placement of such boundaries should also be designed to facilitate the integration of different types of knowledge because collaborative efforts become more prevalent and complex at higher levels of the hierarchy (Grant, 1996). More specifically, at the top of this hierarchy, cross-functional
knowledge (e.g., research and development, complex problem solving) transfer occurs rapidly and across many different areas of highly specialized knowledge streams. This cross-functional knowledge sharing can be difficult to achieve. For example, limiting the number of individuals involved in these exchanges offers a valuable mechanism for reducing inefficiencies, time, and noise, but can also overlook or downplay specialized knowledge critical for success.

Knowledge is embedded in numerous organizational features such as goals, routines, directives, culture, policies, systems, and the like. Designing boundaries and facilitating coordination within the firm must take into account how specialized knowledge needs to be integrated and where it may intersect with external parties. Such coordination requires an understanding of the type of interdependence (pooled, sequential, reciprocal, and team) present to integrate knowledge most efficiently and effectively (Thompson, 1967; Van de Ven et al, 1976). Each type of interdependence has discrete implications (i.e., different types of communication, different patterns and degree of coordination) as you move along the continuum of interdependence. In this framework, design of appropriate communication becomes a critical issue in insuring that specialized knowledge is integrated throughout the organization. By creating and institutionalizing routines and sequences, and implementing rules and directives, an organization can minimize opportunities for faulty communication and “automate” to some extent the integration of knowledge (Grant, 1996). Routines can also be used as a mechanism to generate a variety of outcomes that range from maintaining stability to fostering continual change (Feldman & Pentland, 2003).

To this point, Herbert Simon (1973) suggests that the manner in which organizing occurs (the placement of organizational boundaries) creates externalities when certain interdependencies are ignored. While management’s role is to minimize these issues, managers often do not account for, or recognize, important interdependencies which allows negative externalities to arise (e.g., communication issues, barriers to collaboration). For example, high levels of reciprocal
interdependency necessitate a high degree of integration (Lawrence & Lorsch, 1967). Ideally, then, understanding what specialized knowledge needs to be organized (and prioritized) to accomplish critical tasks should be the primary objective of management when determining how to accommodate and account for interdependence throughout the hierarchy. However, as I have noted earlier, extant structural arrangements can restrict decision makers’ attention to all the critical interdependencies and limit effectiveness.

*Organization Design in Health Care*

The placement of organizational boundaries, including the extent of specialization (Herzlinger, 1997; Porter and Teisberg, 2006) and the degree of system integration (Enthoven and Tollen, 2005; Enthoven, Crosson and Shortell, 2007) are central issue in the debate about effective design of the US health care system. Indeed, arguments related to this debate can be conceptualized in terms of the knowledge-based theory of the firm. Specialized knowledge (e.g., clinical decision-making, patient-centered care) can be viewed as the foundation of an organizational structure that must account for integrating such knowledge. For example, performing a surgical procedure in an operating room is designed to follow routines, directives, and rules that govern the process (Grant, 1996). Underlying these coordination mechanisms is the understanding that correctly diagnosing a patient and successfully performing a surgical procedure have the best chance of producing a positive outcome for the patient.

Grant’s (1996) knowledge-based theory of a firm can be used as a lens to gain insight into how to achieve effective coordination across clinical specialties and other care providers in this study’s context. For example, integrating knowledge across non-translational electronic health records, medical specialties (e.g., surgery, pathology, radiology, nursing, oncology, etc.), and settings (e.g., inpatient hospital, outpatient surgical centers, freestanding outpatient imaging centers) can be extremely difficult to do in a timely and accurate manner—especially when a variety of organizational
models already exist. By aligning each of the processes on the foundation of specialized knowledge (diagnostic processes & treatment decisions), as Grant (1996) recommends, can enable organizations to improve the structure within which collaboration may occur. In effect, some health care organizations have begun to recognize this need and have formed multi-disciplinary teams (e.g., cancer tumor boards) that facilitate collaboration across clinical specialties. These teams are focused on clinical decision-making and patient care, and when approached in an engaged and collaborative manner, can be considered “organizational routines” (Grant, 1996). Such teams are governed by a set of mutually agreed upon rules, sub-routines, norms, etc. that facilitate knowledge integration and collegial interactions – even when providers are employed by competing organizations. Gittel et al. (2010) found that multi-disciplinary team meetings can strengthen the relationships among individuals who perform distinct roles (e.g., surgeons, oncologists, nurses, physical therapists, case managers, etc.), but have highly interdependent work.

Much of the recent health care debate related to organizational design and the placement of organizational boundaries has revolved around how to design efficient care delivery systems such that costs are minimized and quality outcomes and access points are still maximized. However, Weinberg et al. (2007) argue that there is a lack of accountability and few incentive payment structures in place to motivate providers to “care” about what occurs after a patient leaves their direct supervision. Thus, US health reform has thrust this debate into the spotlight among national and international audiences with the controversial formation of accountable care organizations (ACO).

Accountable care organizations are designed to be held responsible for “both the cost and quality of care for a defined group of patients” (Addicott & Shortell, 2014, p. 270). This new approach emphasizes new payment methodologies (e.g., payment bundling between physicians, hospitals, and insurance companies), a shift to lower cost settings (e.g., outpatient settings), and
patient self-management of specific diseases. One element in achieving success in this new structure may be the integration of specialized knowledge through a new way of organizing that is more patient-focused. This literature on ACOs builds on Grant’s (1996) work by incentivizing the reorganization of a sector of the health care payment and delivery system to be more focused on interdependent tasks. Moreover, it puts greater emphasis on organizing based on the interdependencies between care providers. Other similar examples of recent organizational design shifts in health care that attempt to organize based on interdependent tasks include the patient-centered medical home (Rittenhouse et al., 2011), hub-and-spoke models of care delivery (large tertiary care centers affiliated with small community hospitals), health information exchanges (HIE), and shifts from small independent physician practices to large employed multi-specialty physician group practices.

**Gaps in the Extant Literature Addressed by the Current Study**

The extant literature in health care focuses primarily on how integrating specialized knowledge across organizations and systems can improve effort toward collaboration. However, it doesn’t really explain the processes responsible for this improvement. That is, it doesn’t unpack *how* or *why* the placement of organizational boundaries influences the integration of such knowledge. I address this issue by qualitatively exploring how different boundary structures relate to the cognitive focus of health care organizations.

**Methods**

**Setting**

The present study examines organizational attention and integration within the context of breast cancer care. Breast cancer is the most commonly diagnosed cancer type and the second leading cause of cancer-related deaths among US women (DeSantis et al., 2014). Moreover, US women have a 1-in-8 lifetime risk of being diagnosed with breast cancer (DeSantis et al., 2014).
Many factors contribute to the complexity of preventing, diagnosing, and treating this disease such as clinical expertise (NCCN Guidelines, 2014), resource availability (Behringer et al., 2007; Wingo et al., 2008; Louis et al., 2013), patient adherence to physician recommendations (Tan et al., 2013), and organizational capabilities (Powell, 1998). However, these factors and many others may be highly interdependent and vary based on the place(s) where services are provided and/or the types of people providing care.

I used a comparative case study design which included key informants from three health systems. Given the exploratory nature of this study, I sought the participation of health systems that shared overlapping markets and/or service areas, yet differed substantially in their organizational approaches to breast cancer care. This perspective may help explain strategic differentiation in providing similar services where patient selection of care providers may influence, to some extent, where care is received. Moreover, I sought organizations that varied somewhat in terms of their structural characteristics, such as size, physician composition, care delivery paradigms, and extent of inter-organizational coordination. And while the section that follows provides a general overview of the three health systems in this study, I look to my analysis of the interview text to provide further insights on the key structural characteristics of each health system, the distribution of attention and the impacts on patient care.

*Case Study 1: Health System “A”*

Health System “A” was a medium-sized, free-standing acute care hospital located in a suburban area. Operating as a not-for-profit hospital, Health System “A” offered a variety of inpatient and outpatient general medical and surgical services. Moreover, this health system owned and operated an ambulatory surgical center (ASC), outpatient imaging center, and a breast care center. There are two other competitors with satellite offices (which include diagnostic imaging centers) in the local market in addition to many independent physicians.
At the time of this research, Health System “A” had recently purchased its first small (<50) physician practice that included medical and surgical specialties. Despite this recent purchase, the vast majority of the organization’s breast cancer providers (except for some primary care physicians) were not employed by Health System “A.” Thus, the majority of breast cancer care was performed by physicians who had privileges to practice at Health System “A,” but had no financial relationships with the organization. The implication of this physician model was that Health System “A” relied primarily on independent community physicians, or providers who were affiliated with competing health systems, to provide care to its patients with breast cancer. Health System “A” had the greatest number of providers involved in providing breast cancer care.

Health System “A’s” breast care center was located in a medical office building near the main hospital and was co-located with its ASC. It incorporated many core diagnostic services such as screening and diagnostic mammography, ultrasonography, breast magnetic resonance imaging (MRI), bone density testing, fine needle aspiration, needle localization, and ultrasound-guided biopsies. Surgical procedures were either performed in the ASC or in the main hospital operating room (OR). Other adjuvant therapies were performed at the main hospital or at physician offices within the community.

Case Study 2: Health System “B”

Health System “B” was a large, rurally-located academic medical center. As a part of a not-for-profit network of hospitals, Health System “B” offered full-scale inpatient and outpatient services for many common and rare diseases. Moreover, it owned and operated an ASC, multiple outpatient imaging centers, and a children’s hospital. Health System “B” utilized an electronic medical record that was integrated across all of its on- and off-campus hospitals, surgery centers, physician practices, and imaging centers.
Health System “B” employed a large (>500) multi-specialty physician practice, which encompassed physicians in all specialties (i.e., breast surgery, radiology, pathology, medical and radiation oncology, etc.) caring for patients with breast cancer. Based on the vast capabilities of the physicians in this group, Health System “B” did not need to rely on external physicians for any component of care. However, this group of physicians accepted referrals from external physicians and interacted with those physicians to transfer information when appropriate. Health System “B” had the fewest number of providers involved in providing breast cancer care.

Health System “B” did not have a dedicated breast care center designed for specializing in breast cancer care. Patients who required screening and diagnostic testing received it in the main hospital radiology department. The radiology department housed breast imaging services including screening and diagnostic mammography, ultrasonography, breast MRI, bone density testing, fine needle aspiration, needle localization, ultrasound-guided biopsies, and MRI-guided biopsies. Patients requiring surgery, adjuvant therapy, and other breast cancer related services scheduled appointments and received care at the main hospital in the department where their physician was located. Each specialty was on a different floor or located in a medical office building across the street from the hospital. Surgical procedures were performed either in the Health System “B” ASC or in the main hospital OR.

Case Study 3: Health System “C”

Health System “C” was a large, not-for-profit academic medical center located in a rural area. Health System “C” offered full-scale inpatient and outpatient services and was affiliated with a large university and medical school. This organization owned and operated an ASC, multiple outpatient imaging centers, a children’s hospital, a Cancer Institute, and a breast care center.

Health System “C” employed a large (>500) multi-specialty physician practice, which encompassed physicians in all specialties (i.e., breast surgery, radiology, pathology, medical and
radiation oncology, etc.) relevant to breast cancer. Based on the vast capabilities of the physicians in this group, Health System “C” did not need to rely on external physicians for any component of care. This group of physicians accepted referrals from external physicians and included externally-affiliated hospitals in their breast cancer-specific meetings. However, the majority of these interactions were based on a lack of expertise within the externally-affiliated health system. External health systems often sought out the advice of the physicians employed by Health System “C” and compensated them (through formal affiliations) for such advice. Health System “C” had a moderate number of providers involved in providing breast cancer care.

Health System “C” operated a full-scale breast care center in a medical office building approximately one mile from the main hospital campus. Co-located at this off-site location were breast imaging and breast surgery services. Moreover, medical oncology had clinic space at this location used for consultations prior to and following chemotherapy administration. This facility had the ability to perform all breast imaging services such as screening and diagnostic mammography, ultrasonography, breast MRI, bone density testing, fine needle aspiration, needle localization, ultrasound-guided biopsies, and MRI-guided biopsies, as well as having provided breast surgical services including consultation and lumpectomies. Higher intensity surgical procedures requiring inpatient hospitalization were routinely performed in the main hospital OR. Adjuvant therapy and other breast cancer-related services were provided in the Cancer Institute located within the main hospital.

Data Collection

Investigators identified informants using a non-probability discriminative snow-ball sampling technique. Potential informants were initially identified through existing relationships with members of each participating health system and those informants provided the names and contact information for subsequent interviewees. Investigators narrowed the lot of informants to individuals
who were involved with breast cancer patients at any point across the care continuum (i.e., prevention, screening, diagnosis, treatment, or survivorship). Institutional Review Board approval was granted for all study methods and materials by each participating institution and The Pennsylvania State University. Preceding any research activities, informed consent was obtained from all informants.

A semi-structured interview guide was used to question informants at all health systems. Interviews began with a grand tour question related to each health system’s overall breast cancer screening, diagnosis, and treatment process (Spradley, 1980). Specifically, the question was, “From your perspective, can you describe the process that a breast cancer patient goes through within your organization?” Subsequent interview questions including the following topics: informant background and experience, breast cancer services offered by the hospital, the roles of the individuals involved in the patient’s care at each phase of the continuum, internal and external communication, organizational and other barriers to timely care, strategies to overcoming barriers to timely care, and leadership of the diagnostic and treatment processes. Detailed notes were taken by the interviewer(s) during each interview and saved for analysis. On average, interviews lasted approximately 60 minutes, were audio-taped, and later transcribed. Table 1 provides the interview guide used during each interview.
<table>
<thead>
<tr>
<th>Question Category</th>
<th>Questions &amp; Probes</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Informed Consent</strong></td>
<td>1. Have you read and understand the terms of the informed consent? (Verbal confirmation was needed from informant prior to proceeding with any further interview questions.)</td>
</tr>
</tbody>
</table>
| **Informant & Organizational Background** | 1. What is your educational background and training?  
2. How long have you worked for this organization in this capacity or any other?  
   2a. How long have you worked with breast cancer patients? (Probe)  
3. What is your role in providing breast cancer services at your organization?  
   3a. How often do you provide these services? (Probe)  
4. What breast cancer services are offered at or through this organization? |
| **Breast Cancer Diagnosis and Treatment Process** | 1. Typically, when do you (or your organization) first come into contact with patients who are undergoing diagnostic testing or treatment for breast cancer?  
   1a. How are patients referred to you? (Probe)  
   1b. What is the nature of the first contact? (Probe)  
2. From your perspective, can you describe the process that a breast cancer patient goes through with your organization following your first contact with that patient?  
3. From your perspective, who are the other providers involved in the continuum of care, both within and outside of your organization?  
   3a. Why are these providers important in delivering timely breast cancer diagnosis and treatment? (Probe)  
   3b. Do you routinely communicate with these other providers? (Probe)  
   3c. How do you communicate with these other providers? (Probe)  
   3d. How often does this communication typically occur? (Probe) |
| **Barriers to Breast Cancer Care Delivery** | 1. From your perspective, can you discuss the major barriers to timely diagnosis and treatment of breast cancer?  
2. Can you describe some of the typical barriers one might encounter during (a) the process of diagnosis, (b) from diagnosis to the beginning of treatment, (c) from the beginning of treatment until your last contact with the patient?  
   2a. Are the barriers organizational, process-related, provider-based, etc.? (Probe)  
3. Can you describe any regulatory or organizational barriers you have personally experienced while assisting patients across the breast cancer care continuum?  
4. Can you describe some of the common barriers that patients have reported in accessing services?  
   4a. Are the barriers organizational, process-related, provider-based, etc.? (Probe)  
5. Would you discuss the origin(s) of the barriers you previously described?  
   5a. Are the barriers organizationally-rooted, socially-rooted, etc. (Probe) |
### Facilitators to Breast Cancer Care Delivery

1. From your perspective, can you discuss the major facilitators to timely diagnosis and treatment of breast cancer?
   
   1a. Are these facilitators related to information technology upgrades, care coordination efforts, etc.? (Probe)

2. Can you describe some of the typical facilitators of care you might encounter during (a) the process of diagnosis, (b) from diagnosis to the beginning of treatment, (c) from the beginning of treatment until your last contact with the patient?
   
   2a. Are these facilitators related to information technology, care coordination efforts, etc.? (Probe)

3. How have you used information technology to eliminate barriers to timely care for breast cancer patients?
   
   3a. Has it been in the context of access to medical information, integration across providers, etc.? (Probe)

4. Can you describe some of the strategies used to overcome regulatory or organizational barriers you have experienced while assisting patients through the diagnosis and treatment processes?

5. Can you describe some of the facilitators that patients have reported to be helpful in allowing for timely access to breast cancer services?

   5a. Were these facilitators related to information technology, care coordination, etc.? (Probe)

6. From your perspective, who are the key individuals (and their job duties) involved in overcoming barriers to breast cancer diagnosis and/or treatment?

7. Why are these individuals important in overcoming barriers to timely breast cancer diagnosis and treatment?

8. From your perspective, when is the best opportunity to reduce or eliminate barriers to breast cancer care?

### Leadership/Structure

1. From your perspective, who do you believe is leading the breast cancer care delivery process within your organization?

2. What does it mean to be a cancer center?

3. Is a cancer center different than a breast care center?

### Open-ended

1. What else is important to know about the process of diagnosing and treating breast cancer and/or the barriers/facilitators to timely care that I neglected to ask you?

2. If you could change one thing to improve patient care provided to breast cancer patients, what would it be?

### Recruitment of Informants

1. Is there anyone else you know who may provide valuable insights on the topics we previously discussed?

   1a. (If yes) Would you be willing to connect us with that person to schedule an interview? (Probe)
In all, 30 key informant interviews were completed. The number of key informants participating in the study for Health System “A,” “B,” and “C” were 8, 11, and 11, respectively. Informants were assigned to the health system where they were employed or where they most frequently practiced medicine. Physician interviewees came from a variety of different clinical specialties such as primary care, radiology, pathology, breast surgery, plastic surgery, radiation oncology, medical oncology, and behavioral health, whereas non-physician informants performed roles in inpatient and outpatient nursing, patient navigation, clinical trials, genetics, and care coordination.

Data Analysis

Using the principles of Grounded Theory set forth by Strauss (1987), the study’s lead author reviewed the interview transcripts without a pre-determined coding scheme. Analysis of each health system’s transcripts began following the first interview with an informant from each of the three health systems. Open coding, “the interpretive process by which data are broken down analytically,” was initially performed (Strauss & Corbin, 1990, p.423). During this process, In-vivo coding, the practice of abstracting a word or short phrase directly from the interview transcript, was then used to retain the authenticity of informant statements (Strauss, 1987). Interviewer notes written down during the interviews were examined during this process to clarify informant statements or provide additional context to the In-vivo codes. As the interviews at each health system progressed, I assessed the transcripts for saturation. Saturation was determined to have occurred when few or no new themes resulted from additional interviews within each health system. Upon reaching saturation, no new informants were needed from that health system. Three non-structured memorandums, one for each health system in the study, were started with the commencement of
transcript reviews and were finalized upon reaching saturation at each health system (Charmaz, 2006).

Using the informant statements harvested through the In-vivo coding process, I was able to generate first-order categories indicative of the key issues dealt with by each health system. The findings from the first-order categories were then reviewed and used to construct second-order themes. Based on the findings from this exercise, I returned to the data a final time using a selective coding approach. This approach was used to illustrate the analysis and to find the relative frequency of key informant statements within each second-order theme. To compare the number of references to each category within a second-order theme across health systems, I counted the number of times each categorical statement was referenced by informants from each health system. Then, I averaged the number of references by the number of informants at each health system to account for the variation in the number of informants at each health system. This selective coding approach was confirmed by a second coder to insure that relevant issues were not omitted during the primary coder’s review of the transcripts and that all informant statements germane to the analysis were garnered.

**Findings**

I begin presenting my findings by summarizing the key structural characteristics that differentiate the three health systems in this study. With these characteristics providing the basis from which I will compare the health systems, I then preview the findings from the three case studies by presenting the model of first-order categories and second-order themes. The model provides a basic visualization of how the categories and themes emerged inductively throughout my analysis. I then present my findings based on the main observations at each of the three health systems organized according to the second-order themes (with respect to each first-order category) and the primary areas where key informants focused their comments. Here, I include textual
passages and quotations provided by key informants to exemplify and provide further support for my findings. I then provide a more in-depth comparative analysis across the health systems based on the frequency with which informants from each health system discussed issues related to each of the three second-order themes. This comparison illustrates the types of issues where each health system most frequently focused its attention.

Key Structural Characteristics by Health System

Table 2 depicts a matrix of key structural characteristics that differentiate the three health systems in my study. Each of these characteristics were discussed by the vast majority (a minimum of 80%) of informants within each health system and helped provide the factual basis needed to establish the high-level structural context related to each health system. Specifically, I found that four distinctive structural characteristics were present in the data including physician contracting, the extent of inter-organizational coordination, clinical structure, and the location of breast cancer services. For example, informants discussed that while Health System “A” did not employ the vast majority of physicians on its medical staff, Health Systems “B” and “C” used a fully-employed medical staff paradigm. Moreover, Health System “B” was found to have structured its clinical services according to multi-disciplinary service lines, whereas Health Systems “A” and “C” organized by physician specialty.
Table 2. Structural Characteristics by Health System

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Health System “A”</th>
<th>Health System “B”</th>
<th>Health System “C”</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physician Contracting</td>
<td>Non-Employee Affiliation</td>
<td>Employed</td>
<td>Employed</td>
</tr>
<tr>
<td>Inter-organizational</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Coordination</td>
<td>High</td>
<td>Low</td>
<td>Medium</td>
</tr>
<tr>
<td>Clinical Structure</td>
<td>By Physician Specialty</td>
<td>Multi-Disciplinary Clinical Service Lines</td>
<td>By Physician Specialty</td>
</tr>
<tr>
<td>Location of Breast</td>
<td>Multiple</td>
<td>Multiple</td>
<td>One</td>
</tr>
<tr>
<td>Cancer Services</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

First-order Categories and Second-order Themes

The Figure illustrates the first-order categories and second-order themes that resulted from my grounded analysis of the interview text. Review of the interview text identified that 14 first order categories were commonly discussed among informants at each health system. First, I found that six issues related to breast cancer service location, operational processes, insurance payment and physician reimbursement, guidelines and regulations, deficits in breast cancer-related clinical specialties, and technology – electronic health record (EHR) were commonly discussed by informants. These topics reflected a tactical focus for their attention and coalesced into the first theme: tactical-focused attention. Second, informants discussed three topics related to patient-centered care, involving patients in treatment decision-making, and including patients in multi-disciplinary meetings. These topics were grouped into the second theme: patient-focused attention which revealed how the involvement of breast cancer patients influenced where each health system focused their attention. Third, informants spoke about five issues related to breast cancer program management, care continuum management, clinical decision-making, internal health system politics, and interpersonal conflicts. These topics were organized into the third theme: provider relationship-focused attention which described how relational issues influenced where the focus of attention was directed.
Tactical-focused Attention

Breast Cancer Service Location

Key informants at all three health systems discussed the location of breast cancer services at their organization. Eight out of 8 (100%) of informants at Health System “A” focused on this issue
as their health system provided breast cancer services at numerous geographic locations. More specifically, outpatient services (i.e., mammography, ultrasound, etc.) were located in an office building about a half-mile from the main hospital where the operating rooms and various other services (i.e., radiation therapy) were located. One informant described this complex organizational configuration at Health System “A” by saying,

“One of the first things we got smacked in the face with, was a patient our navigator met with on the inpatient side who was post-lumpectomy. She [the patient] started talking about her experience of going with a needle in her breast from the outpatient breast care center, getting in the hospital van and being driven across the street in a hospital gown, and having to check into the front desk of the main hospital where her surgery was. That’s the way it happens here. It wasn’t until we had an objective person hearing this experience that we started to think, how do other places similar to us do this? I couldn’t believe it really is standard of care. But, because of the expense of having a mammography unit and [mammography] tech based in a hospital when your breast center is outpatient, we can’t do everything in both places. That’s the way these things [the components of the breast cancer diagnostic process] have evolved here...”

Health System “B” organized their service offerings differently. This organization did so according to clinical service lines (e.g., radiology, surgery, radiation oncology, etc.) and where each service was provided within the main hospital. Health System “B” did not offer any separate outpatient locations and while 3 out of 11 (27%) informants discussed this topic generally, one informant from this health system exemplified it by stating,

“No, we don’t have just a breast center. We call it the virtual breast center. Mammography is on one end of the hospital [in the radiology department] and we [breast surgery] are on the other end of the hospital in the general surgery department. The radiation oncology department is on the lower level and the medical oncology department is in a building near the parking lot.”

Four out of 11 (36%) informants from Health System “C” broadly discussed the configuration of their organization’s breast cancer services by highlighting its efforts to consolidate the vast majority of services (e.g., screening, specialist consultation, treatments, etc.) into a single location. One informant from this health system described this by saying,

“Fortunately here we have a fully run breast clinic outside of the hospital walls about a mile from the main campus...We have radiology where we do mammograms,
breast ultrasounds, MRIs, and biopsies under the same roof as the breast surgeon and the medical oncologist.

*Operational Processes*

Some informants at each health system discussed issues related to operational processes and how such issues were perceived to hinder breast cancer care although the topic was mentioned by a larger percentage of Health System A’s informants than the other two health systems. Seven out of 8 (88%) of key informants at Health System “A” described process barriers that slow the process of care delivery and clinical decision-making. For example, one informant discussed a scenario where Health System “A” has had to re-examine their process to avoid failures that had caused patients to miss follow-up treatments by stating,

“I now have them [the cancer registry folks] saving all the abnormal or positive breast cancer pathology reports because we never know when the doctor has told them they have cancer…I have to do this because patients are falling through the cracks and not following up with their treatment.”

Some key informants (4 out of 11) from Health System “B” discussed operational processes specific to their organization that may be adding unnecessary steps to the process of providing breast cancer care. For example, one informant from this health system described how he needed to keep returning to the primary care physician for clinical orders, and thus delaying the diagnostic process, by saying,

“If I [the Radiologist] think somebody needs a biopsy [following a positive mammogram reading], I could immediately have confirmation before the patient left that the biopsy is scheduled. I don’t have that here [at Health System “B”]. What we are working towards is an order set that doesn’t require me to keep going back to the primary care physician every step of the way for approval…Here, [the process] leaves my hand at the control of the primary care physician.”

Another informant from Health System “B” discussed an operational process barrier by saying, “We can’t always get patients in for biopsies. We can only do certain types of biopsies on certain days because you need specially-trained support staff. You need to have an opening in the schedule to plug the patient in to and it also needs to work with their [the patient] schedule.”
Four out of 11 (36%) key informants from Health System “C” discussed process issues related to Oncotype DX® Breast Cancer Assays testing, a genetic test used by physicians to help guide treatment decision-making, and the barriers it presents to providing timely and accurate care.

One informant from this health system described this by saying,

“…we commonly get Oncotype DX® testing on patients. We often don’t get that sent out until after the patient comes back and sees the surgeon which may be two or four weeks. It then takes two weeks to get the test back and the patient will then be sent back to me to talk about radiation therapy and I don’t know whether I’m treating them then or treating them six months from now. I need a better process for getting those results quicker.”

Insurance Payment & Physician Reimbursement

Few informants from each health system described the challenges their organization faced in coping with insurance payment and physician reimbursement issues. Given that breast cancer has widely been a reimbursable diagnosis for many decades, the key informants from each health system that talked about this category, focused primarily on how to help patients navigate the insurance system. For example, one informant from Health System “A” discussed how selecting a surgeon can be troublesome for patients at their health system by saying,

“Then they [the patient] get hooked up with the surgeon and of course what insurance they have can play into this as well which is frustrating for patients. They may have heard they want to go to this surgeon but their insurance will only pay for them to go to this surgeon.”

On the other hand, a couple of key informants (2 out of 11 from both health systems) from Health Systems “B” and “C” articulated broader health care reform issues relating to physician reimbursement and broader challenges with the insurance payment system. One informant from Health System “B” exemplified this by saying,

“It’s a transition problem. The problem is you know the old adage about building the airplane while you are still flying. We are trying to build this delivery system while the reimbursement is favored towards the old system. Do more, get paid more versus do better job, get paid more. The old system was totally built on quantity. The new reimbursement model we will have a big piece of quality and we are trying to build the quality thing while the quantity dollars are still coming in driving your system. That’s a challenge for us physicians.”
Some key informants at each of the three health systems discussed issues related to breast cancer screening guidelines or regulatory requirements. Key informants at Health Systems “A” and “C” focused primarily on issues related to the breast cancer screening guidelines. One informant from Health System “A” described the relative uncertainty in screening guidelines by saying, “I openly tell patients that there are two thoughts when it comes to screening mammography. One from the preventative task force and one from the cancer society or OB/GYN.” Moreover, an informant from Health System “C” further described this by complexity in the decision as to when to get screened by stating,

“I think you have to decide what guidelines you live by. Do you live by the American Cancer Society or do you live by the Preventative Task Force? Everybody kind of stumbles over that one...My gut is the younger population is still using the American Cancer Society Guidelines for the 40-50 year old woman and the 75 and above woman I think that they get an option and kind of say to them here’s the American Cancer Society Guidelines, you are healthy, you are still indicated, but the Preventative Task Force says that after 75 evidence is insufficient to show significant gain. So you say I will give you the option of what you like to do. Most women are so used to having mammograms and they just keep going.”

As it relates to regulatory requirements, a couple of informants (2 out of 11) from Health System “B” discussed the limitations related to patent issues restricting genetic testing. One informant from this health system exemplified this by saying,

“There is only one laboratory in the continental United States that can do the BrCA analysis. They hold a patent. I don’t know if you have seen it about the law suits. They just won round one to keep the patent on their BRCA1. They are a monopoly and they can do whatever they want as far as charging for the test.”

Genetic testing has become an important part of the breast cancer screening, diagnostic, and treatment phases and with only one company to provide the laboratory testing, it can serve as another barrier to care if turnaround times are lengthy. This (potential for) delay issue was described by multiple informants from Health System “B.”
Deficits in Breast Cancer-related Clinical Specialties

Key informants at each health system described deficits in accessing clinical specialties that provide important breast cancer-related services for patients at their organization. The vast majority of key informants (7 out of 8) at Health System “A” discussed issues related to not having a breast surgeon on their medical staff. One informant from this health system described how the lack of a breast surgeon affiliated with their hospital may be causing their organization to lose patients to competing health systems by saying,

“We don’t have a breast surgeon. We don’t have anybody specialized in breast surgery. The general surgeons in some cases will do mastectomy, but the majority of cases are sent out of town [by referring physicians].”

Similarly, a couple of informants (2 out of 11) from Health System “B” described an interest in growing some of their breast cancer-related specialties, but are facing some challenges in recruiting for this position. One of these informants described this by stating,

“There is a new interest in our radiology department in breast imaging…its high volume. Its high liability issues and very low reimbursement for breast imaging people so it’s not a field that has traditionally not had a lot of people [physicians] interested in going into it.”

On the other hand, while praising their organization for having all the key clinical specialties needed to screen (e.g., breast-specific radiologists), diagnose (e.g., breast surgeons), and treat (e.g., medical and radiation oncologists) breast cancer, several key informants (3 out of 11) at Health System “C” described deficiencies in some aspects of psychological and integrative treatment for breast cancer patients. One informant from this health system exemplified this by saying,

“We are in desperate need of a psychologist right now. We can’t get administration to employ one. Also, we have a wonderful physician who has an integrative medicine program and he’s in the breast center but now because of insurance guidelines we cannot submit to the insurance company so they have to pay for the service with cash and its $150 an hour for his sessions. Most patients cannot afford that and are not going to see him.”
When informants were asked generally about their thoughts as to the technology at their health system, informants frequently answered based on their approval or disapproval of the EHR used at their organization. Several informants at each health system suggested that they had all the necessary screening, diagnostic, and treatment modalities, and were more focused on and concerned with the transfer of information through the EHR on a daily basis. The vast majority of key informants (7 out of 8) from Health System “A” expressed frustration with their EHR. One physician informant affiliated with Health System “A” exemplified this by saying,

“We are very disjointed between systems. One of the oncologists that refers to me works at [Health System “C”]. He has his own [EHR]. Our group has our own [EHR], but I am not currently on it, but I think the general surgeons are, but I can't access any of their records and [Health System “B”] can't access ours either. So, any records that I need are hard copy or fax. I don't think that has really helped me in anyway and takes much longer to get information.”

On the contrary, informants from Health Systems “B” and “C” commonly conveyed positive remarks about their organization’s EHR. For instance, one informant from Health System “B” exemplified this by saying,

“We have had it so long now that it's hard to remember what it was like without it. It [the EHR] has made everything so much easier to just be able to see everything about every patient...We get a much more comprehensive look at each patient. It is so much easier to communicate with all of their providers.”

However, when they identified limitations, they were in the vein of using their advanced EHR to continuously improve information sharing and streamline processes. For example, one informant from Health System “C” said,

“What I really want to get is a list of everybody who is overdue. There’s a queue that will come up about 3 months. Then when I see the patient the electronic record will have red flashing light that will tell you the mammogram is overdue. It’s right in your face. You can't miss it. We don't have that now.”

Another informant from Health System “C” stated another limitation of the EHR by saying,
“I don’t think it’s designed well for longitudinal data…where you have a patient who is seen by one attending and multiple residents intermittently over the course of a three-year period…If you go into the electronic medical record, you cannot find all those notes signed by the attending physician…It’s a tremendous problem.”

**Patient-focused Attention**

**Patient-Centered Care**

Organizing care efforts such that patients were at the center of care processes was described by some informants across two of the three health systems (“B” and “C”). While informants from Health System “A” made zero references, specific or general, to patient-centered care, informants from Health System “B” spoke the most frequently about this topic. One informant at Health System “B” exemplified why having patient-centered care is important to his organization by saying,

“There is an occasional rare patient who is an engineer or an accountant that is knowledgeable about the practical details [of breast cancer and processes]…For most patients, and it’s just overwhelming. They are frozen in space and if somebody doesn’t take the responsibility of literally navigating them through the process, the whole thing can come to a grinding halt. That’s why we put the patient at the center of it all and make sure they have the support they need to get through it [breast cancer treatment]."

Similarly, a couple of informants (2 out of 11) from Health System “C” noted that patient-centered care can be beneficial to patients and that their primary care practices have the necessary components of a patient-centered medical home. However, one informant suggested some hesitancy in believing that Health System “C” provides patient-centered breast cancer care. She said,

“I think we can do better for the patient. I think that the breast center should look more at a total integration of patients care and an absolute road map from the day of diagnosis through survivorship. Also, we should provide guidance for patients when the other social issues arise through the stages. We don’t consider those issues enough.”

**Patient Involvement in Treatment Decision-Making**

Key informants at each of the three health systems discussed their perceptions of how their organization feels about involving patients in decisions about their care. To varying degrees, the three health systems had differing perspectives on this. Some informants (2 out of 8) from Health System “A” expressed hesitancy in involving the patient in the details of the decision-making
process. One informant at Health System “A” exemplified this by saying, “There are limitations on how involved the patient can be with making treatment decisions. Because even if you have the best memory in the world, you cannot remember what everyone is going to be throwing at you.” This statement supported the general perspective at Health System “A” that the physicians were dictating the approach without too much interchange with patients. Similarly, to a greater extent, informants from Health System “C” did not emphasize including the patients in the treatment decision-making process unless the patient expressed an interest. One informant from this health system described this by offering that:

“…patients vary tremendously in their interest in knowing what’s going on with treatment…Some people are going to hear they have a diagnosis of cancer. They are going to go online. They are going to learn about their disease. The options for treatment. They are going to ask you detailed questions. Then there are other people, the vast majority of people, who are going to say, doc do what you think you need to and I don’t want to be involved in the details [of the decision-making].”

Informants from Health System “B” described what appeared to be a more proactive approach in involving patients in their care decision-making. Eight out of 11 (73%) of key informants from this health system agreed that the patient needed to be involved in making the most appropriate treatment decisions for the individual. While the clinicians ultimately assumed responsibility for the diagnostic process (similar to the other health systems), informants from Health System “B” suggested that their physicians go further in considering the patients’ perspectives in deciding on an appropriate treatment regimen. One informant from this health system exemplified this by saying,

“…one of the first things we do when a patient has a diagnosis of breast cancer is do a full workup…financial, family life, work life, all of that gets looked at by the navigator in our breast program. We then bring this information to our multi-disciplinary meeting when we discuss that patient. After we come up with the treatment recommendation, we speak to the patient and try to accommodate any issues she might have based on her specific situation. We also sometimes present a couple of treatment options that might work best for that specific patient and let her choose…we encourage them to bring family members to hear the treatment options also…”
Patient Inclusion in Multi-Disciplinary Meetings

Multi-disciplinary meetings were described by informants from all three health systems as a mechanism that health systems use to bring breast cancer care providers together in a collaborative environment with the goal of determining the appropriate course of treatment for breast cancer patients. More specifically, one informant from Health System “A” stated that the main purpose of these meetings was to “increase communication” and “keep things moving” between care providers who may otherwise find barriers to effective and timely communication. However, despite this common purpose, key informants at each health system outlined different paradigms for their multi-disciplinary meetings. The vast majority (10 out of 11) of key informants from Health System “B” spoke positively about their health system’s approach to involving patients in the multi-disciplinary meeting process. For example, one informant from Health System “B” discussed this by offering that,

“We talk about all of the patients [discuss the radiology, pathology and other information related to the patients attending the multi-disciplinary clinic meeting that day]. We do that for an hour over lunch…there are four main [multi-disciplinary] clinic providers: behavioral medicine/psychology, surgical oncology, medical oncology, and radiation oncology. The patients are put in rooms. Then what we do is every provider goes in and speaks with the patient so we have sort of a rolling room thing. Over the course of that appointment, each patient will meet with the provider in each of those four specialties.”

This patient-centered approach allowed for immediate feedback to the patient following the multi-disciplinary meeting and expedites the process of moving through the treatment phase. Health Systems “A” and “C” did not involve the patient in a similar manner.

While Health Systems “A” and “C” did not include breast cancer patients in their multi-disciplinary meetings, each of these health systems distinctly structured who was able to participate in these meetings. For example, one informant from Health System “C” described the participation of externally-affiliated hospitals by stating,
“We have a couple of places [regional competitor health systems] around here where we have affiliation agreements with them. They will actually present their new cases...at our weekly conference...it helps so that someone who perhaps is a solo practitioner in a private practice in the community can have the support of maybe 5 other people [clinical specialists] at the center here.”

Moreover, Health Systems “B” and “C” had breast cancer-specific multi-disciplinary meetings while Health System “A” included more cancer sites than just breast cancer. One informant from Health System “A” described this by saying, “We don’t have the luxury of having site-specific [breast only] cancer conferences. They do at [Health System “B”] and they do at [Health System “C”]. We just don’t have the numbers for it.”

**Provider Relationship-focused Attention**

*Breast Program Management*

Key informants from each of the three health systems discussed the management paradigm deployed within their health system. Health System “A” had a somewhat unique organizational chart compared to the other two health systems such that it employed a non-clinical Administrative Director to oversee all cancer programs (including the breast cancer program). This individual had direct supervisory responsibility for all employed staff (e.g., nursing, patient navigation, etc.) and the implementation of strategic initiatives within all cancer programs. Given that Health System “A” employed very few physicians, this health system adapted their leadership structure to fit this care delivery paradigm.

On the contrary, both Health Systems “B” and “C” empowered physicians to lead their breast program. Health System “B” appointed the Director of General Surgery, who was a practicing breast surgeon, as the program lead. This surgeon had responsibility for many of the other clinicians involved in the care continuum (e.g., patient navigator, clinic nursing staff, etc.) and was responsible for the implementation of the program’s strategic initiatives. Moreover, another breast surgeon from Health System “B,” who had previously been responsible for the breast
program for nearly two decades, served as the liaison with the broader health system women’s health program. One informant from this health system described the need to maintain this relationship with the physician overseeing the women’s health program by saying,

“…since he [the Director of the women’s health program] is not directly involved with the delivery of care of women with symptomatic breast disease so we have educated him over last year and he has recognized what a major component to women’s health we are [the breast cancer program]. So he made this liaison role [from the breast cancer program] who needs to say OK…how can we build a program that is really going to enhance women’s health programs but keep a focus on breast cancer services.”

Health System “C” used a somewhat different approach in assigning management roles to their breast cancer program, albeit through the use of physicians. The breast cancer program at Health System “C” had Co-Chairs that had offices that were co-located in the breast cancer center off-site location. The Co-Chairs were both regularly involved in patient care as one was a breast surgeon and the other was a radiologist who specialized in breast cancer. These individuals had been in these roles for about five years and oversee the clinical operations of the breast cancer center. Moreover, both individuals were considered to be important liaisons to the broader health system Cancer Institute given that the breast cancer center was not physically located within the hospital walls.

Clinical Decision-Making

Informants were asked for their perception of who was leading the breast cancer process throughout the care continuum. While no unanimous individual or job role was identified as the sole or all-encompassing leader at any of the three health systems, most informants (more than 75% of informants at each health system) from Heath Systems “B” and “C” named the breast surgeon as the main clinical decision-maker. This surgeon’s oversight of the diagnostic process (which is sometimes viewed as the most complex phase of the care continuum) and clinical expertise was perceived as critical to ensuring an accurate diagnosis, starting the most appropriate evidence-based
treatment, and facilitating communication between a number of care providers. For example, one informant from Health System “B” described the breast surgeon’s leadership role by saying,

“[The breast surgeon] usually sees the patient first and is who leads the multidisciplinary conference. [The breast surgeon] is the one who presents the patients. Everybody else is there to give their own opinion. Once all of the recommendations are made, [the breast surgeon’s staff] is usually who has to arrange all of the follow-up in the departments and follow-up testing…”

On the other hand, key informants from Health System “A” were split as to who was clinical decision-making leader. The two clinical decision-making individuals who were thought to be primary decision-makers were the radiation oncologist and one of the medical oncologists. At Health System “A” the radiation oncologist was the physician who lead the coordination of information presented at the multidisciplinary clinic meeting and had been a physician at the hospital for many years, while the medical oncologist was highly respected based on his years of experience in the field and positive report with hospital staff. One informant from Health System “A” described the leadership role of the medical oncologist by offering,

“If they are a patient with cancer, the oncologist is brought in on consult. And then he is essentially the coach…We interact with the oncologist because we see them every day. They are here every day. We also have a formal meeting on Mondays with the oncologists.”

Care Continuum Management

Key informants also described how operational process leaders were an important factor in ensuring patients’ progress from one phase of care continuum to the next. The vast majority of informants (at least 75% of informants) from all three health systems identified the patient navigator as the main operational process leader within their health system. Key informants from multiple health systems suggested that the navigator was also typically the one insureing that patient appointments were scheduled and kept, transportation issues were resolved, insurance questions were answered, and multi-disciplinary meetings had all the necessary information prior to the providers’ discussion. One informant from Health System “C” exemplified this by saying,
“We have a patient navigator at the breast center who works with breast cancer patients and providers...She starts helping facilitate things early on and she is very involved from time of the abnormal mammogram until they meet the oncologist or the surgeon-in coordinating that. Then they often help the physician’s office staff coordinate care, too.”

Another informant from Health System “C” stated, “The navigator is really the person. They are sort of the shepherd to make sure the patients get where they are supposed to be…”

Patient navigators were also found using their personal relationships with internal and external stakeholders to keep patients moving throughout the care continuum; especially when information was not being communicated effectively between care providers. An informant from Health System “A” further exemplified how the patient navigator was a valuable operational resource in communicating with important information between providers and patients by saying:

“…our navigators can serve as a point person to facilitate overcoming some of those things [patient issues with communicating with their providers]. If you have someone, whether socioeconomically or educationally or just being completely overwhelmed by the diagnosis itself or isn’t even sure which foot goes in front of the next one; we’re able to make sure that if you get to the navigator, they will make it [understanding important information that may not have been comprehended previously] happen for you.”

**Internal Health System Politics**

Some key informants from each of the three health systems discussed political issues within their organization. The most notable political issues discussed by informants were at Health System “B” and related to the possibility of gaining additional financial resources to develop a more patient-friendly breast cancer center. This new space would be designed to include screening services and an improved breast cancer multi-disciplinary clinic location. One informant from this health system exemplified this long-standing health system issue by saying,

“I have been here for [many] years and I am now on maybe the fifth or sixth breast cancer committee...We would have these committees and then make recommendations to administration and nothing would ever happen…They built a new hospital here that opened 2 years ago that is 9 stories. Only 2 floors are filled…That was a potential space but no space has been given to the breast clinic. A few years ago they also opened an ambulatory center…it’s a big space and still not all utilized. They could have put a breast clinic in there
too…no breast clinic was ever put there. My personal opinion is it costs money to do this and they [administration] doesn’t look at it as a money maker…”

Few informants (3 out of 11) from Health System “C” spoke about similar political issues between the breast program and health system administration. One informant from this health system described this by saying,

“It costs a lot to run a breast program and we often need things but don’t get them…It’s enlightening when you get to meet with the higher executive group because they really don’t understand what we do here [in the breast cancer center] even though you think they would. You wonder how they can make decisions about our department without knowing what we do.”

While some political issues were noted between the breast cancer program and Health System “A” administration, a couple of informants (2 out of 11) discussed political issues among the physicians affiliated with the health system. One informant from this health system offered that, “There was a breast surgeon here and he just up and left…it had to do with him wanting to leave his group and he’s been forced out of the area for at least a year. That group is really hurting our area by not letting that doctor set up a practice here.”

Interpersonal Conflicts

Key informants from Health System “C” discussed the vast majority of issues (of the 8 passages discussing interpersonal conflicts, Health System “C” accounted for 7) related to interpersonal conflicts among the three health systems. Six out of 11 (55%) informants from this health system described conflicts between breast cancer care providers. One informant from Health System “C” offered, “…the only problem is the Chief of Plastic Surgery. He’s a really good friend, but he’s very stubborn.” Another informant from Health System “C” described commonly experienced interpersonal conflicts by saying, “Some people work well with each other and some people don’t. Sometimes there’s a history there that affects how people work together. I think we [the care providers in the breast cancer center] struggle sometimes with our family practice docs…”
Comparative Findings across the Three Health Systems

Table 3 depicts the number of statements made by informants at each health system according to where their attention was focused (tactical, patient, or relationship). Overall, key informants from Health System “A” made the most references to all three attention types per informant (16.6 references per informant), while Health Systems “B” and “C” made approximately the same number of references (10.6 and 10.3 references per informant respectively). Eight of 8 (100%) informants from Health System “A” made the most references per informant (11.0 references per informant) to tactical-focused attention issues, whereas informants from Health Systems “B” and “C” made fewer references per informant (2.2 and 1.7, respectively) to these types of issues. Eleven of 11 (100%) informants from Health System “B” made the greatest number of statements (6.1 references per informant) to patient-focused attention issues, while Health Systems “A” and “C” made fewer references (1.5 and 2.1, respectively). Finally, 11 of 11 (100%) informants from Health System “C” most commonly made references (6.5 references per informant) to provider relationship-focused attention issues, whereas Health Systems “A” and “B” made fewer statements (4.1 and 2.4, respectively) related to these issues.
Table 3. Focus of Attention Types as Referenced by Key Informants by Health System

<table>
<thead>
<tr>
<th>Focus of Attention Type</th>
<th>Health System &quot;A&quot;</th>
<th>Health System &quot;B&quot;</th>
<th>Health System &quot;C&quot;</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td># of references</td>
<td># of informants</td>
<td># of references</td>
</tr>
<tr>
<td></td>
<td>to each type of</td>
<td>referencing</td>
<td>to each type of</td>
</tr>
<tr>
<td></td>
<td>focus (average #</td>
<td></td>
<td>focus (average #</td>
</tr>
<tr>
<td></td>
<td>per informant)</td>
<td></td>
<td>per informant)</td>
</tr>
<tr>
<td>Tactical-focused¹</td>
<td>88 (11.0)</td>
<td>8 of 8</td>
<td>24 (2.2)</td>
</tr>
<tr>
<td>Patient-focused²</td>
<td>12 (1.5)</td>
<td>3 of 8</td>
<td>67 (6.1)</td>
</tr>
<tr>
<td>Provider Relationship-focused³</td>
<td>33 (4.1)</td>
<td>7 of 8</td>
<td>26 (2.4)</td>
</tr>
<tr>
<td></td>
<td>133 (16.6)</td>
<td>N/A</td>
<td>117 (10.6)</td>
</tr>
</tbody>
</table>

¹Includes references made to topics such as breast cancer service location, operational processes, insurance payment and physician reimbursement, guidelines and regulations, deficits in breast cancer-related clinical specialties, and technology-electronic health record.

²Includes references made to topics such as patient centered care, patient involvement in treatment decision-making, and patient inclusion in multi-disciplinary meetings.

³Includes references made to topics such as breast cancer program management, care continuum management, clinical decision-making, internal health system politics, and interpersonal conflicts.
Discussion

The theory and evidence I have presented suggests an important relationship between the design of health systems and the focus of attention that results. My exploratory findings also revealed three distinct foci of attention; tactical-focused attention, patient-focused attention, and provider relationship-focused attention that manifested themselves to the greater or lesser extent in each of the three health systems compared in this study. I use these themes and related findings to further develop my ideas about how the structural design of health systems plays an important, yet previously unidentified, role in achieving patient-centered care.

Table 4 further develops the previous table consisting of the key structural characteristics by health system, by adding the focus of attention type present at each health system. These findings suggest that the dominant attentional orientation differs at each of the health systems. Moreover, health systems aspiring to have a patient-focused attention, must consider other structural characteristics than just the location of providers. For example, one informant from Health System “A” suggested that, “Having all of our existing services under one roof would solve our problems…it would facilitate more referrals, people would talk more to each other, and everyone can lay eyes on each other.” My findings suggest otherwise that having a “one-stop shop” where all services and physicians are co-located is not a sufficient, or even a necessary, mechanism to achieving a patient-centered structural orientation. In fact, the structural characteristics associated with Health System “B” indicate that employing physicians, minimizing the extent to which the health system must coordinate care with external organizations, and having a multi-disciplinary clinical service line approach may be more important factors.

Moreover, I argue based on the findings that determining the appropriate clinical structure may be the most important structural characteristic to achieving a patient-focused structural orientation. My findings suggest that Health System “B” has differentiated itself primarily by how it
organized clinically; organizing to account for the interdependencies between care providers (Simon, 1973). This distinctive approach may have been a key factor in its differentiation from Health System “C.” For example, 4 of 11 (36%) informants from Health System “C” discussed that despite having a convenient and easily-accessible location where nearly all breast cancer services are provided, silos persisted between employed physicians and clinical departments–likely resulting in more provider relationship-focused issues. Meanwhile, several informants from Health System “B” did not discuss any negative issues related to silos between departments and often referred to their clinical structure, as the primary driver of service integration and an enabler of patient-centered care.

Table 4. Structural Characteristics by Health System with Focus of Attention

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Health System “A”</th>
<th>Health System “B”</th>
<th>Health System “C”</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physician Contracting</td>
<td>Non-Employee Affiliation</td>
<td>Employed</td>
<td>Employed</td>
</tr>
<tr>
<td>Inter-organizational</td>
<td>High</td>
<td>Low</td>
<td>Medium</td>
</tr>
<tr>
<td>Coordination</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Clinical Structure</td>
<td>By Physician Specialty</td>
<td>Multi-Disciplinary Clinical Service Lines</td>
<td>By Physician Specialty</td>
</tr>
<tr>
<td>Location of Breast</td>
<td>Multiple</td>
<td>Multiple</td>
<td>One</td>
</tr>
<tr>
<td>Cancer Services</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Focus of Attention</td>
<td>Tactical</td>
<td>Patient</td>
<td>Provider Relationship</td>
</tr>
</tbody>
</table>

Study Limitations

Similar to other exploratory studies of this nature, the current study is not without limitations. First, the study sample consisted only of key informants at three health systems in a shared market and was not population-based, which may limit the generalizability of this study. However, the nature of my conclusions are meant to be informative in theorizing about what I have learned from this context and serve as a basis for further examination on this topic. Future research using a larger sample of health care organizations is needed to validate generalizability. Second, I
did not collect longitudinal data one each of the three organizations. This limitation hinders my ability to address the influence of time on organizational learning any related shifts in the focus of organizational attention. Future research should consider this study design to better understand how the maturity or regression of a breast cancer program may reflect the focus of attention. Third, my data may experience asymmetry of information bias since I was not able to speak with everyone involved in breast cancer care at each health system. This may dilute my ability to fully understand the extent of the relationships present within each health system. Nonetheless, I reached saturation points at each of the three health systems indicating that limited new information was being learned with each additional interview. Fourth, key informants were interviewed as reflections of their organizations, but may introduce their own personal biases that do not necessarily reflect exactly how the organization functions. However, key informants were initially identified by senior-level administrators or physicians in leadership positions, so the individuals who participated in this study were considered to be among the most reputable sources of breast cancer care information at each health system. Fifth, this study did not include breast cancer patients and what, if any, role patients play in determining the foci of attention at any of the three health systems may be lacking. However, the focus of this study was on the perspectives of care providers and was the most effective approach to understanding the key issues and focus areas of each health system. Last, I lack specific data related to collaborative and competitive efforts between the three health systems in this study. Since sharing a local market has implications for both collaboration and competition, future research may target the influences of these issues on structural design, and in turn, the focus of organizational attention.

**Practice Implications**

Despite these limitations, this study may guide health system administrators and physician executives in understanding the implications of how past structural design choices play a role in
determining where current organizational attention gets focused (Ocasio, 1997). The findings highlight that health systems must consider the relationship between a number of different structural characteristics (such as service location, the nature of physician employment models, the extent to which an organization must coordinate care with other organizations, and clinical structure) and the resulting focus of attention when determining where to place organizational boundaries. Although some informants from all health systems noted that being patient-centered may have financial limitations based on the current fee-for-service model (e.g., examining 2 breast cancer patients during an afternoon in a multi-disciplinary clinic versus examining 8 patients with any cancer type in the physician’s regular office), the shift in payment models to value-based care is encouraging because reimbursement methodologies will be more closely tied to quality outcomes and patient satisfaction rather than volume.

My study supports the idea that patient centeredness is not simply a vision of putting patients at the center of care processes, or even solely a cognitive orientation. Instead, patient-centeredness should be considered also as a structural orientation where organization design focuses on the patient’s problems-to-be-solved. In turn, by focusing more effort on these types of issues, organizational decision-makers may be able to avoid relying on patch-work processes as the adhesive to their organization.


Chapter 4

CONCLUSION
Research Question

What roles do system thinking, boundary spanning, and social network management play in cancer patient navigation in Appalachia?

Objective

To understand whether and how cancer patient navigators in Appalachia reflect the key characteristics of systems thinking, boundary spanning, and social network management.

Key Findings

Each group of informants (health system informants, community-based organization informants, and university-affiliated informants) discussed similar themes and characteristics with relative frequency. Patient navigators were found spanning boundaries and using their social networks to overcome negative externalities resulting from a variety of sources. I elaborate on these findings and present a theoretical framework for the antecedents and functional role of patient navigation.

Conclusions

Study findings indicate that cancer patient navigators should build and use their social networks to span boundaries and overcome the negative externalities in the system. My framework suggests that the need for these capabilities among navigators derives from four primary sources—the nature of patient problems, external influences, organizational boundaries, and individual behavior—and how they interact. Addressing the negative externalities associated with these issues
reflects an ability to understand and respond to both macro- and micro-level issues across the care continuum. These findings provide insights both for managers attempting to address underlying health system issues and for navigators who desire to be more effective.

**Key Learning Points**

From this study, I have learned that the need for the role of patient navigators has likely emerged as a result of an inefficient health system. In creating a health system that is riddled with work-arounds focused on overcoming negative externalities, patient navigators have emerged across the nation as a gap-bridging strategy (or as I think of them, they are “band-aids” holding together inefficient processes and poorly communicating care providers). However, there is little evidence that (or exactly how) supports and effectively evaluates whether they are really working. I believe that the inability to definitively measure the effectiveness comes from the vast array of patient navigation models and variation in the types of people that are hired into these roles. Thus, the practical implications are key and organizations should place greater emphasis on the hiring process and finding candidates that have the more appropriate capabilities, rather than hiring someone because they have a general interest in patient navigation. Further, I have learned that because of the key issues causing patient navigation to emerge, the navigator level may not be the best place to examine how effective patient navigation is. Rather, it is possible that further examination at the program-level or health system level may more accurately depict whether these programs are obtaining the results they have set out to achieve. This is an area of research that has had little exposure to date.
Research Question

To what extent do the organizational characteristics of the hospital where care is delivered explain breast cancer diagnosis delays?

Objective

To examine whether certain characteristics of the hospital where breast cancer was diagnosed—its ownership structure (e.g., public or private), specialized capabilities, system membership, and organizational size—were related to delays in breast cancer diagnosis.

Key Findings

The baseline study sample consisted of 4,547 breast cancer patients enrolled in Medicare. I found that hospitals with for-profit ownership (p<.01) and those with comprehensive oncology services (p<.10) had shorter diagnosis delays than their counterparts. Estimates for system membership and size did not prove statistically significant at conventional levels.

Conclusions

Some structural characteristics of hospitals (ownership, specialized capabilities) are associated with the degree of delay in diagnosing breast cancer. Researchers must go beyond examining demographic and clinical characteristics to understand timely cancer diagnosis.
Key Learning Points

From this study, I have learned that some types of health care organizations may outperform others in designing processes that facilitate a more timely breast cancer diagnosis. While I have found that short time (in days) difference may not be all that critical in insuring a positive mortality outcome for breast cancer patients, I have learned that there is a huge benefit in obtaining an accurate and timely diagnosis to the psychological health of a woman enduring this process. Looking to for-profit organizations may hold some of the answers in understanding how to organize processes and care providers such that diminishing wasteful steps (and in turn unnecessary wait times) can be achieved. It is my suspicion that the alignment of incentives holds the key. Moreover, the ability to turn the potential for cash (e.g., a patient lingering on in the system) into cash (obtaining a confirmed breast cancer diagnosis) and proceeding to treatment is likely the driver. Since the highest dollar aspects (e.g., reimbursement for surgery and radiation therapy) of breast cancer care occur in the later phases of the process, for-profit organizations may have “tricks” to incentivizing care providers to move more quickly without sacrificing quality. And thus, the organizational attention of for-profits may be focused in distinctly different ways that non-profits.
Research Question

How does the structural design of a health care organization (e.g., boundaries) influence the direction of organizational attention?

Objective

To examine whether and how health care organization design issues across multiple settings were related to specific issues where attention was focused.

Key Findings

I found variation across the three health systems in terms of where organizational attention was primarily focused. More specifically, each organization was categorized into one of three distinct foci of attention types (tactical-focused attention, patient-focused attention, and provider relationship-focused attention) that manifested themselves via the specific issues discussed by key informants from each health system.

Conclusions

Study findings suggest that the placement of organizational boundaries (i.e., physician contracting paradigm used, the extent of inter-organizational coordination, clinical structure, and location of breast cancer services) can create situations where an organization’s structural design distributes the focus of attention across different types of issues. Moreover, having a “one-stop
shop,” where all services are provided in a single location doesn’t appear to be a necessary, or even sufficient, means to having a patient-centered structural orientation.

**Key Learning Points**

From this study, I have learned that health care organization design decisions play an important role in where attention gets directed. Design choices are critical because they influence focus of attention both directly and indirectly. Considering that these structural decisions are often among the first activities to be completed in creating a health system, and are usually the most costly, the implications of “getting them wrong” can be disastrous. Moreover, ignoring important interdependencies among care providers may result in a series of complex operational problems that require time consuming and wasting work-arounds. Take the case of Health System “A.” While they function in a highly fragmented cancer care delivery system, it will take them (and has taken them) many years to correctly implement a new organizational design that better meets the needs of their patients and providers. To that end, they have been working on resolving many of the issues they experienced (beginning with acknowledging that they have too many areas where work-arounds have been implemented) at the time this research was performed and have begun to open a new cancer center where many of their old barriers to care are alleviated. These issues point to one of the most important learning points I have taken away from this study: by focusing on finding an appropriate physician contracting paradigm, minimizing the extent of inter-organizational coordination, and designing an effective clinical structure, it may have a greater result in an improved ability to focus on patient-centered issues.
Summary Conclusions

As a common thread woven throughout the three studies in this dissertation, several lessons on the delivery of cancer care have emerged. Most notably, the nature of cancer is highly complex and multi-dimensional. Moreover, it is clear that no perfect paradigm exists today that alleviates all barriers related to providing timely care and insuring that it can happen every time, without fail. Providing effective cancer care is not like an assembly line and must be respected as such.

Despite numerous community and organization-based approaches to preventing cancer, increasing awareness to the benefits of screening, determining accurate diagnoses and treatments, and maintaining a healthy life well into survivorship, the US health care system often falls short of its goals. Problematic health care organization design issues (and subsequent organizational attention) often give rise to externalities that create the need to implement patchwork processes. For example, we have shown that because of significant gaps in the cancer care system, health systems, community-based organizations, etc. have begun using patient navigators to overcome such gaps. This strategy adds costs to the health care system and can even exacerbate issues related to timely care, especially when the navigator is not effective in his/her role. Indeed, effective selection, training, and monitoring of patient navigators can improve their efficacy. However, I believe that a less fragmented cancer care system, that includes provider networks that better account for the interdependencies between care providers, would not require their use.

These issues are further compounded when thinking about different organizational characteristics and the incentives related to each. For instance, we found that for-profit hospitals, who are ultimately interested in maximizing profit, performed better than their counterparts in achieving timely breast cancer diagnoses. Does this mean they are better places to go for care? Ultimately, that depends on one’s definition of “better.” It seems reasonable that timeliness is not the only metric that should be evaluated; rather it should be a blend of patient, process, quality, and
community-based metrics. In fact, it may be that for-profit organizations have better solved issues related to structural design (and focus on patient-centered issues more) and have more effective navigation techniques. However, even if this were true, other streams of research have shown that a drawback to for-profit hospitals is that the cost of care is often higher in these settings. So how do we get it right remains a key question to be answered and will become a focal point of my research moving forward. To this point, many demonstration projects focusing on new structural designs and better integrating care providers, and networks of providers, are emerging to determine how to better provide care. More specifically, a greater emphasis is now being placed on disease prevention and patient-self monitoring than it ever has before. This may create the need for care navigators to restructure their roles and become more interested in community-based outcomes rather than simply overcoming gaps in individual hospitals and health systems.

This dissertation provided a great opportunity to explore some of the key questions related to health care organizations and cancer care that I care about. As a cancer survivor, preparation of these three studies meant more than just finding an appropriate study design to address an important research question related to cancer care. This was my opportunity to understand how hard it really was for my team of care providers to work together, collaborate across boundaries, and cure my illness.
Christopher John Louis was born in Bridgeport, Connecticut in 1982. After completing his work at Masuk High School, Monroe, Connecticut in 2000, he attended Sacred Heart University in Fairfield, Connecticut where he earned the degree of Bachelor of Science (BS) in Business Administration in May 2004. He then attended the University of Florida in Gainesville, Florida where he earned the degree of Master of Health Administration (MHA) in May 2006. Between May 2006 and August 2009, he worked as a hospital administrator in Florida. In August 2009, he began doctoral studies at The Pennsylvania State University in the Department of Health Policy & Administration. While completing his doctoral degree at The Pennsylvania State University, Chris also served in multiple strategic planning leadership roles for health systems and consulting firms.