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ICD-10-CM Implementation Strategies: An Application of the Technology Acceptance Model

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This is to certify that the doctoral study by

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Abstract

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MBA, Nova Southeastern University, 2008

BS, Florida Atlantic University, 2004

Doctoral Study Submitted in Partial Fulfillment

of the Requirements for the Degree of

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Abstract

The United States is one of the last countries to transition to the 10th edition of the International Classification of Diseases (ICD-10) coding system. The move from the 35-year-old system, ICD-9, to ICD-10, represents a milestone in the transformation of the 21st century healthcare industry. All covered healthcare entities were mandated to use the ICD-10 system on October 1, 2015, to justify medical necessity, an essential component in determining whether a service is payable or not. Despite the promising outcomes of this shift, more than 70% of healthcare organizations identified concerns related to education efforts, including lack of best practices for the ICD-10 transition. Lack of preparation for the implementation of ICD-10 undermines the clinical, technological, operational, and financial processes of healthcare organizations. This study was an exploration of implementation strategies used to overcome barriers to transition to ICD-10. A single case study was conducted, grounded by the conceptual framework of the technology acceptance model, to learn about ways to mitigate the barriers of this new coding system. Data were gathered from the review of documents, observations, and semistructured interviews with 9 participants of a public healthcare organization in Florida. Data were coded to identify themes. Key themes that emerged from the study included (a) in-depth ICD-10 training, (b) the prevalence of ICD-10 cheat sheets, (c) lack of system readiness, and (d) perception of usefulness of job performance. The results of the study may contribute to social change by identifying successful implementation strategies to mitigate operational disruptions that will allow providers to capture more detailed health information about the severity of patients' conditions.

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Dedication

I would like first to dedicate this study to my Lord and Savior, Jesus Christ, for giving me the grace and favor to be successful on this journey. This doctoral study is also dedicated to my husband, Davidson Monestime, thank you for steadfast support and love. I am so happy that you are my life partner. I also want to dedicate this study to my parents, George and Yolande Pierre-Louis. Thank you for always pushing me to be my very best. You both migrated here and worked effortlessly to ensure that I had everything I needed to be successful while abandoning your needs. I love you both and appreciate all of your sacrifices. To my children, Priscilla and Davidson Jr., I want you both to know that with God, all things are possible. Whatever your dreams are, go for them, and remember to put God first, and He will direct your path. I am a living witness. To Commissioner, Chairman Jean Monestime, given your busy schedule and responsibilities, you were available to assist me on this journey, I thank you from the bottom of my heart.

Acknowledgments

I would like to acknowledge that this doctoral journey has been a rewarding and an enjoyable experience. At times, it was a challenge juggling school, work, and family. In the end, it was all well worth it. This would not have been possible without the support, encouragement, and inspiration from a great team of individuals. I was very fortunate to have an excellent committee that supported me. Thank you to Dr. Roger Mayer for his wisdom, direction, and commitment. Thank you to Dr. Craig Martin and Dr. Edward Paluch for their critical reviews of my doctoral study. I would also like to thank Dr. Freda Turner and Dr. Rocky Dwyer for their support.

I thank the participants in my study for their contributions and their time. My thanks to Dr. Patricia Mason, Dr. Bessie DiDomenica, and Dr. Gail Johnson Morris for their support every step of the way. Finally, I am grateful for my Walden classmates and friends, including “the accountability group,” for their encouragement.

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Section 1: Foundation of the Study

Carpentier (2012) highlighted that healthcare provider organizations, like all other businesses, must make a profit to stay in business. Legislative changes to the healthcare industry require providers to modify the business side of their practice (Cascardo, 2015). A key operational component for practicing medicine is ensuring optimal reimbursement through proper coding (Tran, Cennimo, Chen, & Altschuler, 2013). Medical coding is the process of translating written information from a patient's medical record into a series of universally understandable designations (Jones, Bull, Acevedo, & Kamal, 2015). When a clinician treats an individual, a set of alphanumeric codes are used to describe the medical diagnoses. The international classification of diseases (ICD) diagnosis codes represent patients' injury and illness to establish clinical justification as they substantiate reimbursement (Utter, Cox, Owens, & Romano, 2013). The 10th revision of the ICD is a 2015 unfunded mandatory implementation for healthcare entities in the United States. There are no federal funds available to assist the industry with the cost of implementation (Plummer, 2015). The purpose of this qualitative single-case study was to explore strategies used to overcome barriers to transition to the ICD, 10th Revision, Clinical Modification (ICD-10-CM) coding system.

Background of the Problem

The U.S. Secretary of Health and Human Services mandated that providers convert from the ICD-9-CM to ICD-10-CM in 2015 (Centers for Medicare and Medicaid Service [CMS], 2014a). For over three decades, the ICD-9-CM code set has been used for disease classification, payment justification, and to validate medical necessity

(Fleming, MacFarlane, Torres, & Duszak, 2015; Manchikanti, Falco, & Hirsch, 2011). The ICD-10 coding system includes two separate and independent volumes, a diagnosis volume (clinical modification [CM]) and a procedure volume (procedural coding system, [PCS]). Since outpatient provider organizations are not required to report procedures with the PCS set; this study only addressed the diagnosis code set, ICD-10-CM (CMS, 2014a).

The transition to ICD-10-CM requires changes to "coding operations, information technology support, and workflow processes" (Krive et al., 2015, p. 4). Healthcare providers may experience revenue and operation disruptions from rejected medical claims if they continue to use the ICD-9-CM codes (McNicholas, 2014). To maintain financial stability, providers bill services using medical codes to obtain reimbursement. The implementation of ICD-10-CM will affect revenue cycle processes and clinical management systems, ultimately placing added operational risk on the organization (Cohrs, 2014). How providers prepare for the mandate will determine the degree of operational success they will experience within their organization. Given that providers are required to submit medical claims using diagnosis codes for reimbursement, there is a current need to identify strategies providers used to overcome barriers to transition to the ICD-10-CM coding system.

Problem Statement

Healthcare providers must comply with a legislative mandate to convert to the ICD-10-CM coding system to avoid billing disruptions (Dexheimer, Scheid, Babaoff, Martens, & Kennebeck, 2015). More than 70% of the United States Government Accountability Office (GAO, 2015) healthcare participants identified concerns related to

education efforts, including lack of best practices and success stories for the ICD-10-CM transition. The general business problem is that there is a lack of preparedness for the implementation of ICD-10-CM. The specific business problem is that some providers lack implementation strategies for overcoming barriers to transition to the ICD-10-CM coding system.

Purpose Statement

The purpose of this qualitative single-case study was to explore strategies providers used for overcoming barriers to transition to the ICD-10-CM coding system. The targeted population consisted of participants of a public health organization in the southern region of Florida including a health information manager, four coders, and four physicians. Similar to Borges, Hoppen, and Luce (2009), I used document reviews, interviews, and direct observations to achieve study credibility and enhance the quality of this case study. Finding triangulation included data gathered from all three sources. The implication for positive social change includes supporting providers through a legislated change with transition insights, including the potential to document best practices and to improve public health reporting (Guffey & Duchek, 2013). Moreover, the successful conversion may support the long-term success of future healthcare reforms.

Nature of the Study

The three research methods a researcher can use are qualitative, quantitative, or mixed methods. Denzin and Lincoln (2011) explained that qualitative research supports the need for understanding the evidence from participants in their real-world settings. Yin (2014) stated that qualitative research is of particular interest to design a study driven to

expand upon or understand a specific problem. Tufford and Newman (2012) suggested qualitative and quantitative methods have different philosophical foundations that lead to different research approaches. Denzin and Lincoln (2011) noted that the quantitative method is a measurement of the particular business problem numerically through variables. Mixed method design encompasses analysis of both qualitative and quantitative data to explore and to quantify the problem (Denzin & Lincoln, 2011; Ross & Onwuegbuzie, 2014). Based on scholarly assertions regarding the appropriateness of the method, the qualitative method was suitable for the purpose of the study approach.

A qualitative approach was best for this study because the focus was on exploring strategies for overcoming barriers to transition to the ICD-10-CM coding system. A researcher can also conduct a qualitative study using grounded theory, phenomenology, ethnography, or case study design. Patton (2002) described the grounded theory design as a collection of data to create many ideas over an extended period. A phenomenological theory model aims to understand the lived experiences of the participants (Edwards, 2013). Kriyantono (2012) described ethnography as a design that a researcher looks for predictable culture patterns of the participants to create an understanding of what groups do. Case study researchers use varied sources of data to develop detailed descriptions of a phenomenon (Yin, 2014). The case study design was appropriate for this study because the goal of this study was for an in-depth understanding of strategies providers used to overcome barriers to transition to the ICD-10-CM coding system.

Research Question

The overarching research question was as follows: What implementation

strategies can providers use to overcome barriers to transition to the ICD-10-CM coding system? Participants responded to semistructured, open-ended interview questions.

Interview Questions

1. What were the major steps in preparing for the ICD-10-CM transition?
2. What barriers are you experiencing to convert to ICD-10-CM?
3. What implementation strategies are you using to overcome barriers to transition to the ICD-10-CM?
4. What benefits of the ICD-10-CM system did you communicate to your personnel/department?
5. How will using the ICD-10-CM coding system enhance your job performance?
6. How can organizations best prepare for this transition?
7. What else could you share that is pertinent to your implementation strategies for ICD-10-CM?

Conceptual Framework

Davis (1983) developed a model for technology adoption, called technology acceptance model (TAM). Davis (1985, 1993) used the theory to offer an explanation for technology adoption, based on the premise that people want to use a system that will benefit their job performance that does not require much effort. Davis (1985, 1993) examined peoples' acceptance of new concepts introduced into a society based on variables that correlate to how the end user views the new system (Pierce, Sarkani, Mazzuchi, & Sapp, 2013). TAM has been widely validated and used as a research-based

model to analyze the acceptance and use of new technology. Researchers are expanding the utilization of the TAM theory into healthcare (Song, Park, & Oh, 2015). Exploring how users come to accept and use new technology is an important research topic that can be used to explain the relative success or failure of a new system. As such, findings from this study may suggest successful strategies to transition to the new classification system, ICD-10-CM, which also includes an information technology (IT) component.

Davis (1989) identified the following key constructs underlying the theory: perceived usefulness (PU) and perceived ease of use (PEOU). As applied to this study, the TAM theory posits that using the propositions advanced by the theory would allow participants to describe implementation strategies used to transition to the ICD-10-CM coding system. The use of the TAM theory allowed the exploration of how providers may overcome barriers to transition to the new classification system by applying the predictors of PEOU and PU.

Operational Definitions

These definitions, which may be industry specific, add clarity to the study.

Computer Assisted Coding (CAC): The use of computer software that is an automated solution to allow the coding process to become more productive, efficient, accurate, and consistent (DeAlmeida et al., 2014).

International classification of diseases (ICD): The international standard diagnostic classification that provides data code sets for defining diseases, signs, symptoms, abnormal findings, complaints, social circumstances, and external causes of injury or disease (Paiste, Kowalick, Motovidlak-Thomas, & Perry, 2012).

International Classification of Diseases, 10th Revision, Clinical Modification (ICD-10-CM): ICD-10-CM has replaced ICD-9-CM to report diagnosis data across all sites of service (Mills, Butler, McCullough, Bao, & Averill, 2011).

International Classification of Diseases, Tenth Revision, Procedure Coding System (ICD-10-PCS): ICD-10-PCS has replaced use of ICD-9 volume 3 to report inpatient procedure data (Mills et al., 2011).

General Equivalence Mapping (GEM): A tool used to translate an equivalent meaning from source ICD-9-CM to target ICD-10-CM, that is, forward mapping, or from source ICD-10-CM to target ICD-9-CM, that is, backward mapping (Centers for Disease Control and Prevention [CDC], 2014).

Perceived ease of use (PEOU): The degree to which the end user believes the technology to be easy to use (Davis, 1993).

Perceived usefulness (PU): The degree to which an individual believes that using a particular system would enhance his or her job performance (Davis, 1993).

Provider: An individual who delivers healthcare services to beneficiaries, with providers including physicians, dentists, podiatrists, psychologists, pharmacists, physical and respiratory therapists, speech and language pathologists, nurses, and clinical social workers (Shah, Johnston, Smith, Ziv, & Reilly, 2009).

Third-party payer: A person or organization other than the patient who is responsible for paying all or part of a patient's medical costs (Weinstein et al., 2014).

Assumptions, Limitations, and Delimitations

Assumptions

Assumptions are ideas accepted as truths (Fan, 2013). The data collection and analysis plans for this study included three assumptions. First, I assumed that the documents reviewed would provide an accurate and current portrayal of provider's perspectives regarding the transition from ICD-9-CM to ICD-10-CM coding system. Documents are a form of artifacts, representations of the values and cultural elements that characterize organizations (Marshall & Rossman, 2011). Moreover, I assumed that the participants would respond candidly and provide complete answers to interview questions designed to elicit their perspective on overcoming barriers to converting to the new coding system. Another assumption was the participants would make comments that add value to the understanding of the phenomena. Furthermore, I assumed I would accurately capture key ideas and themes during the recording, coding, and analysis of the study data using open-ended (rather than leading) questions. Using open-ended questions involves listening actively, engaging with pertinent follow-up questions, and asking participants to discuss their perspectives (Rubin & Rubin, 2012).

Limitations

Limitations are uncontrollable threats to a study (Marshall & Rossman, 2011). Marshall and Rossman (2011) suggested that qualitative researchers address the limitations of studies to demonstrate the credibility of the findings. Kapoulas and Mitic (2012) noted qualitative researchers acknowledge the challenges of studies undertaken to explore a phenomenon. A limitation of this study was that participants might not

represent the industry-accepted expert opinion regarding this phenomenon. However, use of data from this study may be appropriate for theoretical generalization to formulate a more precise problem or to develop a hypothesis.

Delimitations

Delimitations permit the researcher to recognize boundaries of a study (Martínez-Graña, Goy, & Zazo, 2013). The main delimitation of the study was the census sample of participants of the study population (i.e., provider organization) from a single organization, in different office locations, in the southern region of Florida. Daniel (2012) noted that if the objective of the study requires the inclusion of a specific geographical area, it is appropriate to use a census sample. Another delimitation was the geographical constraint of the investigation. Lastly, this study did not address the cost of emerging technology for the transition, specifically CAC (Jones, Beecroft, & Patterson, 2014) and predictive modeling (Cestari, 2013).

Significance of the Study

This study may serve as a resource for the operational and clinical sustainability for practicing medicine while transitioning to fullfilment of a legislative mandate. The conversion will align the United States healthcare industry with a coding system used worldwide to improve the ability to track outbreaks, monitor patient outcomes of treatment, and improve the capacity to manage population health (Gevirtz, 2013). To realize that benefit, providers in the United States will need strategies to overcome barriers to transition from ICD-9-CM to the ICD-10-CM coding. This study may add to the body of knowledge to the nationwide adoption of ICD-10-CM, and may help to

eliminate the current lack of research related to provider adoption. Moreover, this research contributes to improving business processes, practices, and policies (Adams & Gaetane, 2011).

Contribution to Business Practice

This study may contribute to the effective practice of business because the prospect of change can be challenging for most organizations. This is particularly true when the platform of change is occurring on a mandated national scale, as is the case of the conversion to the ICD-10-CM coding system. Watzlaf, Alkarwi, Meyers, and Sheridan (2015) explained that the transition to ICD-10-CM would affect clinical and business operations for providers. The results of this qualitative, single-case study may further understanding in overcoming barriers to transition to the ICD-10-CM system and minimize billing and clinical disruption. Research findings might support the adoption models necessary for the implementation of changing management strategies across health organizations to foster success for the transition to ICD-10-CM and future revisions (i.e., ICD-11-CM).

Implications for Social Change

The results of this study may contribute to positive social change because the conversion supports initiatives that may result in better quality care for patients and aid in creating a sustainable healthcare system. Berwick and Hackbarth (2012) noted that U.S. healthcare spending reached just under 18% of the gross domestic product (GDP) in 2011 and predicted healthcare spending to reach 20% of GDP by the year 2020. While the government is addressing the rising cost of healthcare, the need to capture greater clinical

information to track patient outcomes is also on the forefront (Sanders et al., 2012). The transition to ICD-10-CM will support better documentation of patient care (Guffey & Duchek, 2013), along with supporting the long-term success of healthcare reforms. Additionally, the social impact may be in the modification of current policies and mandates, including financial incentives such as the electronic health records (EHR) mandate, to support provider organizations.

A Review of the Professional and Academic Literature

The purpose of this literature review is to provide context and substantiation of the basis of inquiry for strategies that providers can use to overcome barriers to transition to the ICD-10-CM coding system. The review of the literature begins with an in-depth discussion of the conceptual framework, TAM, including healthcare studies that have included the theory as well as alternative theories, followed by rival theories. The literature review also includes a section addressing the legislation and a review of ICD-10-CM transition barriers for provider organizations. The literature review concludes with methodology considerations. The literature map diagram shown in Figure 1 is a visual demonstration of the literature review for this study.

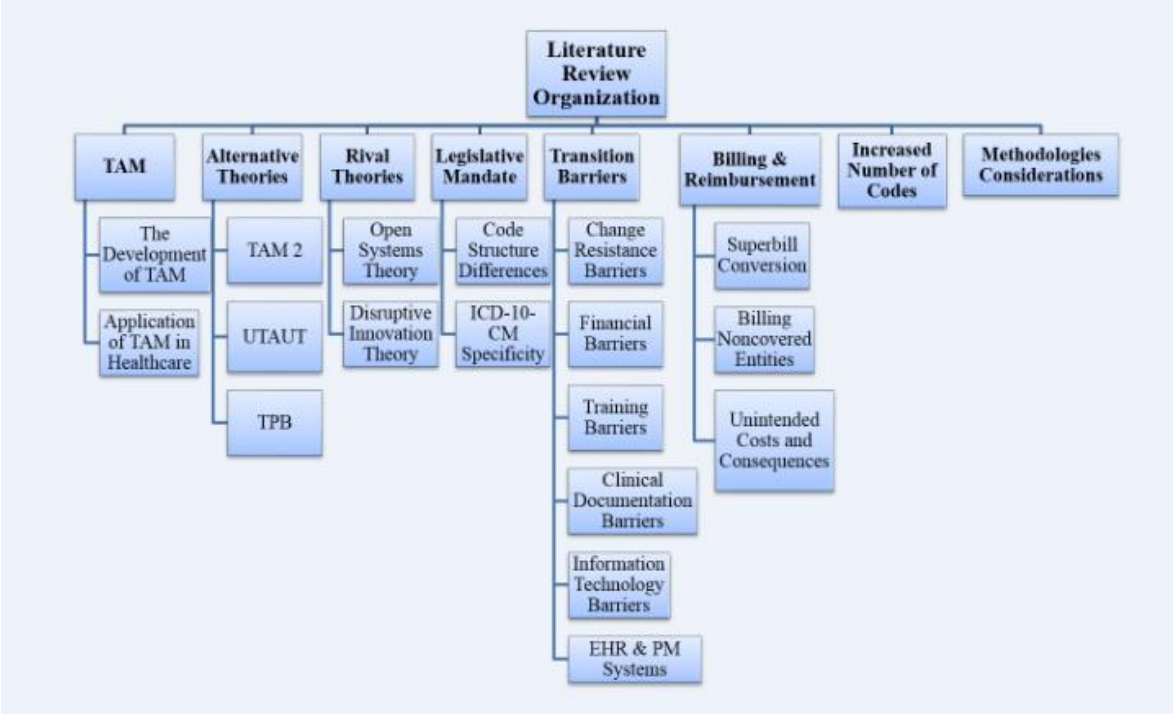


Figure 1. The literature review organization diagram.

Title Searches, Articles, Research Documents, and Journals

Literature compiled for the study included peer-reviewed and other scholarly journal articles, published dissertations, books, and government documents. The sources used to locate the scholarly articles for this literature review were online databases available through the Walden University Library. The databases used included Thoreau with Full Text, Medline with Full Text, CINALH Plus with Full Text, ProQuest Central, ScienceDirect, Emerald Management Journals, Sage Journals, Business Source Complete, and LexisNexis Academic. The sources used to find documents and government websites were the Walden Library in conjunction with Google Scholar and other relevant sources to assist in evaluating and synthesizing the information in the literature review. The total number of references used was 150. Of these, 128 (85%) are

peer-reviewed articles. References published after 2010, within 5 years of my anticipated graduation date, total 125 (83%) of the total references. The total number of references within this section, "A Review of the Professional and Academic Literature," is 84. Of these references, 69 are within 5 years of my expected graduation and 75 are peer reviewed. All referenced older sources include theory authors or seminal resources that add fundamental insights to the study. I conducted my research starting with the following search terms: *technology acceptable model, international classification of disease tenth revision, ICD-9-CM, ICD-10-CM, ICD code transitions, medical coding, clinical documentation, revenue cycle, health information management, medical records, physician practices, provider readiness, barriers, challenges, perceptions.*

TAM

Studies of healthcare users' intentions to use and adopt new technology have exposed barriers to technology in the healthcare industry. However, efforts to explain obstacles and to articulate implementation strategies have lagged. The selection of a conceptual theory that allows in-depth analysis supports the examination of implementation strategies used by providers to overcome barriers to transition to the new classification system. The purpose of this current qualitative case study was to explore strategies providers used to overcome transition barriers to the ICD-10-CM coding system.

Davis (1989) studied managers at IBM to assess their acceptance of new software. In this model, Davis (1989) explained that a person's decision to accept or reject to use a system depended upon two determinants, PU and PEOU. Davis, Bagozzi, and Warshaw

(1989) described that two behavioral predictors—PEOU and PU—influence the acceptance and use of technology. The definition of PU is "the degree to which a person believes that using a particular system would enhance his or her job performance" (Davis et al., 1989, p. 320). The definition of PEOU is "the degree to which a person believes that using a particular system would be free from effort" (Davis et al., 1989, p. 320). The end users' PEOU of a system positively influences the PU and the attitude toward technology (Pai & Huang, 2011).

The adoption of technology in the healthcare industry has moved to the forefront for researchers examining how users come to accept and use new technology. Davis et al. (1989) explained that demonstrating the benefits and ease of use of new technology could eliminate user resistance. Several studies have included TAM for healthcare technology implementation. Pai and Huang (2011) noted that the rapid development of information systems in assisting healthcare to improve the quality of services has become an important subject in health information management (HIM). Similarly, Holden and Karsh (2010) described that an increased interest in users' reaction to health information technology (HIT) has elevated the importance of theories that predict acceptance and use. Further, Lee, Su, Hou, Liao, and Lian (2011) explained that an information system is of no real value if the intended users do not accept and use the new technology. The TAM theory has been the most recognized model that simplifies the fundamental behavior of the user's intentions to use and accept new systems in the information system literature.

Understanding user patterns is of significance because lack of acceptance of technology could result in failure of successful implementation (Ketikidis, Dimitrovski,

Lazuras, & Bath, 2012). The TAM framework provides insight into why individuals accept or reject an innovation (Seeman & Gibson, 2009). The PEOU of the system positively affects the PU and the attitude toward technology (Dünnebeil, Sunyaev, Blohm, Leimeister, & Krcmar, 2012). The position of the user influences whether the user will accept and adopt the application.

The development of TAM. TAM is an extension of the theory of reasoned action (Holden & Karsh, 2010). The theory of reasoned action (TRA) suggests that people are rational decision-makers, intentionally choosing their course of action by analyzing potential costs and benefits (Ketikidis et al., 2012). The focus of the TRA is on individuals' tendency to interpret behavioral patterns (Pai & Huang, 2011). Pai and Huang (2011) explained that to explore the relationship between the perceived emotions and the use of science technology Davis (1993) developed the TAM theory. The TAM replaced the behavioral measures of the TRA with PEOU and PU and no longer included consideration of a subjective norm (Pierce et al., 2013).

Furthermore, the TAM theory argument includes validating the benefits and ease of use and usefulness of new technology to remove user resistance (Davis et al., 1989). Holden and Karsh (2010) suggested that organizations that can pinpoint "factors that shape user's intentions" (p. 160) could implement strategies to promote acceptance. Pai and Huang (2011) further explained that users demonstrate positive attitudes about the new technology if users believe it is suitable for their job performance. Understanding those factors is of particular value because technology acceptance and use are expressions of human behavior. As such, assessing other factors that may affect human behavior such

as mandates to understand acceptance and use could be of value. On a scale of importance, PU is more important than PEOU (Davis, 1993). The greater the usefulness and ease of use, the greater the use of the new system (Ahlan & Ahmad, 2015).

The TAM theoretical framework supports the intention of this current research to explore implementation strategies using the PEOU and PU to transition to the ICD-10-CM system. As Davis (1993) mentioned in his seminal work on technology, acceptance of technology offers the potential for substantially improving job performance. The intent of the TAM theory is to understand users' acceptance (Davis, 1985, 1993). Like Davis (1993), who conducted research by studying managers, the current participants discussed strategies used to overcome barriers to transition to the new classification system. Identifying those strategies that facilitated the implementation of ICD-10-CM by providers might influence other organizations to replicate the same strategies to promote acceptance and use of ICD-10-CM.

Application of TAM in healthcare. The understanding of strategies healthcare providers used to overcome barriers to transition to the new system is an important research topic. Recent studies applied the TAM to "advance the understanding" of clinician technology acceptance (Melas, Zampetakis, Dimopoulou, & Moustakis, 2011, p. 553). Lee et al. (2011) evaluated user's PEOU and PU of a computer-aided decision support system (DSS) for diagnosis-related groups (DRGs) and discussed the benefit of the new system to aid in the selection and determination of accurate DRG coding. Because coding errors could result in a loss of revenue for a hospital and impact the allocation of needed resources, the implementation of a computer-aided DSS would help

coders to increase their coding accuracy. The purpose of the DSS is to enhance the effectiveness of decision-making involved with DRGs. Lee et al. revealed that PU and PEOU had the highest average scores of 5.88 and 5.80 respectively, on a 7-point scale. These findings align with Davis's (1985, 1993) position that PU increased acceptance of new technology.

Pai and Huang (2011) analyzed nurses' intention to use healthcare information systems and indicated that the rapid development of information systems in healthcare technologies required nurses to learn how to use information systems while caring for patients. They focused their questionnaire survey on the revised version of TAM, which includes PU, PEOU, and intention to use healthcare information systems (Pai & Huang, 2011). Pai and Huang found that PEOU had the largest impact on users' intention to use, followed by PU. Moreover, findings from Pai and Huang revealed a lack of alignment with TAM that PU is more important than PEOU.

In a qualitative case study, BenMessaoud, Kharrazi, and MacDorman (2011) explored the rationale behind surgeons' decisions to reject or adopt the robotic-assisted surgical technology. The researchers conducted semi-structured interviews with 21 doctors comprising two groups: users and nonusers. The researchers applied the unified theory of acceptance and use of technology (UTAUT) with a focus on PEOU, PU, and facilitating conditions (BenMessaoud et al., 2011). BenMessaoud et al. discovered that the primary facilitator for surgeons' adoption of robotic-assisted surgical technology were PU ranging from 24% for users to 41% for nonusers. The significant barriers to surgeons' adoption of robotic-assisted surgical technology were PU ranging from 29% for users to

71% for nonusers, and PEOU and complexity at 25% for both users and nonusers. The findings of the researchers BenMessaoud et al. align with the theory that PU is the most influential factor in increasing technology acceptance.

Ketikidis et al. (2012) applied the revised TAM to assess the relevant beliefs and acceptance of HIT systems of nurses and medical doctors. In addition to the technology acceptance model 2 (TAM2) variables, the researchers included the concept of descriptive norms and computer anxiety in their study. Ketikidis et al. used structured anonymous questionnaires and ANOVA to examine differences in TAM variables between nurses and medical doctors. Multiple linear regression analysis was also used to assess the predictors of HIT usage intentions. The researchers indicated that PEOU directly predicted HIT usage intentions at 0.513%, followed by job relevance at 0.208%, and subjective norms at 0.196%. The findings from Ketikidis et al.'s study do not align with Davis's (1985, 1993) position that PU is more important than PEOU.

Song et al. (2015) conducted a quantitative study to assess the relationships among patient safety culture, PU, PEOU, and behavioral intention of nurses to use barcoded medication administration (BCMA) technology, using TAM as the conceptual model. The researchers discussed the benefits of the BCMA technology, which include assistance to reduce medication errors, an area in need of improvement due to high incident rates (Song et al., 2015). The researchers used a quantitative cross-sectional survey to evaluate the acceptance of BCMA technology among the nurses in two Washington-based hospitals using the same technology. Song et al. found that PU was

the most powerful predictor. Findings from this study align with the theory that PU is the most influential factor.

Lee et al. (2011) reported results consistent with findings in BenMessaoud et al.'s (2011) and Song et al.'s (2015) studies; PU increased the acceptance of new technology. BenMessaoud et al. (2011) further explained that PU was a major facilitator for surgeons who used the robotic-assisted surgical technology. Although Lee et al. (2011) suggested that PU had more influence than PEOU, Pai and Huang (2011) recommended a different approach. Pai and Huang's (2011) and Ketikidis et al.'s (2012) findings indicated that PEOU—not PU—had the largest impact on users' intention to use. However, BenMessaoud et al. (2011) found the primary barrier to surgeons' adoption of technology was PU. A better insight of why end users accept or reject innovation (Seeman & Gibson, 2009) can promote implementation strategies to overcome barriers. The lack of alignment in the literature suggests a need for further research on implementation strategies for new systems.

Alternative Theories of the Conceptual Framework

Other researchers have used the original TAM theory for the creation of modified theories. From 2001 to 2005, researchers focused on construct refinement, synthesis, and alternative mechanisms of TAM for their studies (Venkatesh, Davis, & Morris, 2007). Holden and Karsh (2010) also agreed that the TAM theory has gone through iterations of continuous development. Figure 2 depicts the related theories derived from Davis's (1989) TAM approach. The following subsection includes a review the alternative theories related to the conceptual framework, TAM.

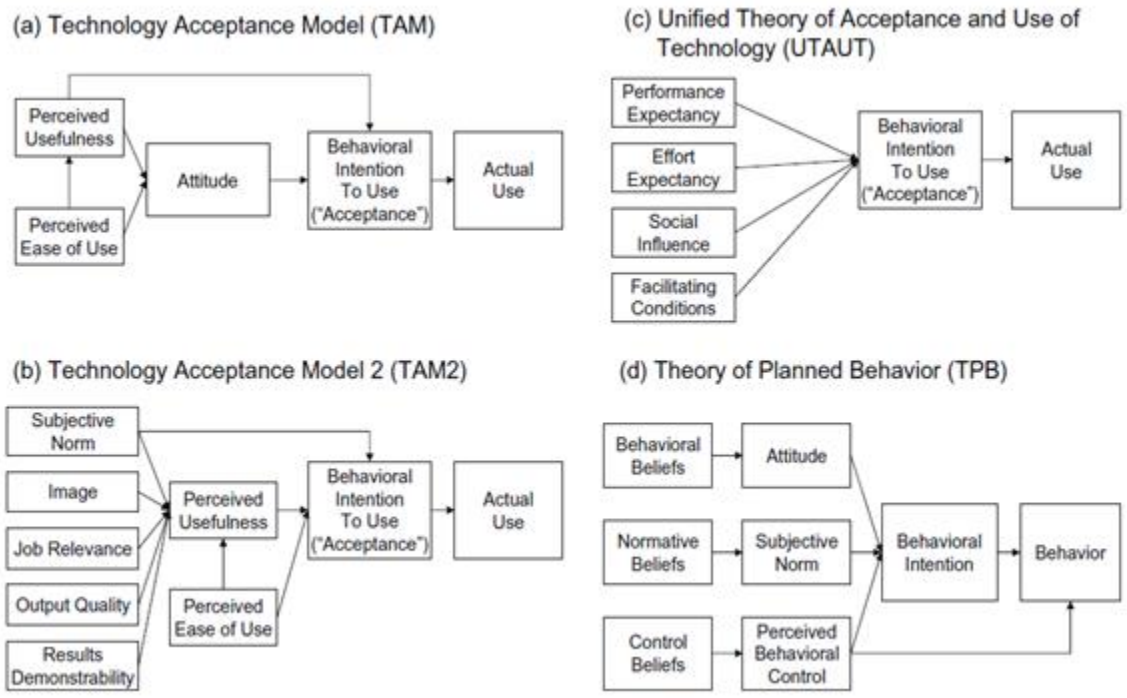


Figure 2. Illustrations of the TAM and related theories. From "The Technology Acceptance Model: Its Past and Its Future in Healthcare" by R. J. Holden and B. T. Karsh, 2010, *Journal of Biomedical Informatics, 43*, p. 161. Reprinted with permission (see Appendix A).

TAM2. Venkatesh and Davis (2000) created the TAM2 model that includes PU and PEOU, in addition to job relevance and subjective norms to capture social influences. The researchers explained that the constructs of job importance reflected users' beliefs about the significance of the new system related to their roles. While the TAM2 has similarities with the original TAM theory, it differs in the content and number of predictors, which were not appropriate for this current study; therefore, the TAM2 was not suitable for this study.

UTAUT. The inclusion of social influences and IT acceptance literature constructs influenced the creation of the UTAUT. Also, the UTAUT incorporates PU into

a performance expectancy construct, PEOU into effort expectancy, and subjective norm into social influence (Holden & Karsh, 2010). Venkatesh, Morris, Davis, and Davis (2003) noted that the UTAUT theory provides an instrument for organizations to assess the likelihood of success for new technology. Unlike the TAM theory, the UTAUT includes social influence to explain the behavioral intention to use a system, which was not a factor considered for the current research. As a result, the UTAUT was not appropriate for this study.

The theory of planned behavior (TPB). Ajzen (1991) created the theory of planned behavior (TPB) to understand and predict how an individual's intentions reflect on actions. The TPB is used to examine different behavior patterns from three constructs; personal attitude, subjective norm, and perceived behavioral control. Kautonen, van Gelderen, and Fink (2015) explained the intention to perform an action could signify how individuals make decisions. Ajzen (1991) further described using TPB to examine the relationship between attitudes and behaviors. TPB would be appropriate for this current study if the purpose were to investigate how providers used implementation strategies to convert to ICD-10-CM. However, the purpose of this study was to explore what strategies healthcare providers used to overcome barriers to transition to the ICD-10-CM coding system. Thus, TPB was not appropriate for this study.

Rival Theories of the Conceptual Framework

The two rival theories for this study were open systems theory and disruptive innovation theory, which provide differing explanations for understanding the

phenomenon. The following sections are an overview of the opposing theories of the conceptual framework.

The open systems theory. As described by von Bertalanffy (1972), the premise of the open systems theory is that the interactions and interrelationships between elements of a system govern the properties and behaviors of the system. Interrelations are one essential component of the systems theory, in which each part connects to every other element, directly or indirectly, and no subsets of items are unrelated to any other subset. Vlismas and Venieris (2011) acknowledged that the "objects [are] operating in concert to produce a specific result and to achieve some goals" (p. 85). Miller (2005) utilized systems theory as a means to investigate and describe a system comprised of separate subsystems that interact to accomplish an overall purpose. Thus, each element within a system interacts together for the accomplishment of its goals and desired outputs. One system's output may then become inputs to another system. Each functional area in a healthcare facility is a system with numerous subsystems. While this theory supports the idea that systems work together to accomplish desired outputs, it does not support ideas that can influence implementation strategies.

The disruptive innovation theory. Christensen's (1997) disruptive innovation theory supports the idea that technology changes can create a disruption to existing business organizations. Williams and Gardner (2012) further described the theory as a strategy to accept growth through technology innovation. Some providers in the industry are in the implementation stages of technology, including EHRs. While this theory supports innovative technology as a driver for disruptive innovation for a competitive

strategy change, it does not provide a framework to explore implementation strategies that may influence successful adoption, which was the purpose of this current study. Therefore, both the open systems and disruptive innovation theory were not suitable to examine this phenomenon.

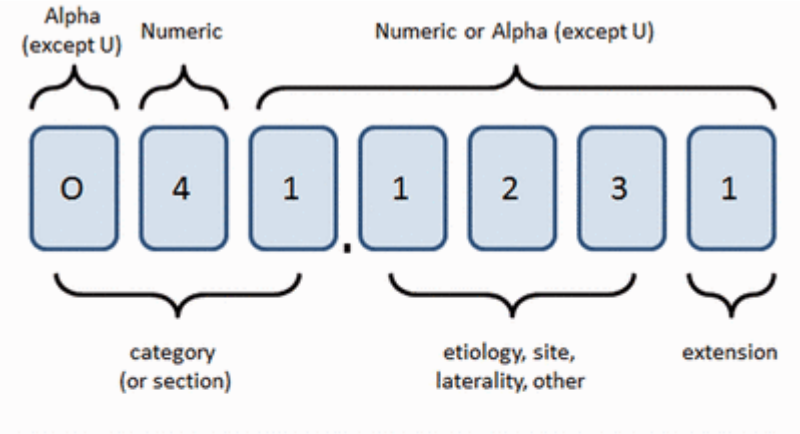
Legislative Mandate

The ICD-10 transition began with the Health Insurance Portability and Accountability Act (HIPAA) of 1996 (CMS, 2014a). The final rule published in the Federal Register on January 16, 2009, served as a mandate to adopt ICD-10-CM and ICD-10-PCS and established the initial compliance date of October 1, 2013 (CMS, 2014b). The U.S. Department of Health and Human Services (HHS) postponed the implementation of ICD-10-CM/PCS twice to October 1, 2015 (Topaz, Shafran-Topaz, & Bowles, 2013). The system change affects every entity of the healthcare sector, including hospitals, physician offices, and medical insurance companies (CMS, 2014a). The ICD-10 code set includes changes to both diagnosis and procedure codes (CMS, 2014a). However, only one applies to outpatient care, ICD-10-CM. This study only addressed the diagnosis code set for the ICD-10-CM transition. Providers in all healthcare covered entities must adhere to this mandate.

Code structure differences. To analyze the transition to the new system, it is important to understand the structure of the two code sets for comparison to reveal the differences. Figure 3 shows the system structure differences. The ICD-10-CM is the diagnosis code portion of the classification system, and it far exceeds ICD-9-CM in the number of concepts, size, and structure (Turer, Zuckowsky, Causey, & Rosenbloom,

2015). Rubenstein (2015) explained that the new system includes new concepts such as laterality, etiology, manifestation, and encounter type. The ICD-10-CM incorporates more detail and specificity than does the ICD-9-CM (CMS, 2014b).

The CDC and the National Center for Health Statistics (NCHS) maintain both ICD-9-CM and ICD-10-CM systems (CDC, 2014). The ICD-10-CM diagnosis coding follows the same logic that the ICD-9-CM follows; however, all codes have been revised and expanded for greater granularity. In 2014, the ICD-10-CM coding system had approximately 70,000 codes while the ICD-9-CM had slightly fewer than 14,000 codes (CDC, 2014). The first character of an ICD-10-CM code is always an alphabetic letter. The letter *U* is the only letter not used in the ICD-10-CM code set as the first character (Manchikanti et al., 2011). The World Health Organization (WHO, n.d.), has reserved the letter *U* for the future provisional assignment of new diseases of uncertain etiology for bacterial agents resistant to antibiotics. Lamb (2014) suggested that the addition of characters in the ICD-10-CM codes would permit the provision of more information about the office visit to the third-party payers.



ICD Version Comparison At-A-Glance		
	ICD-9-CM	ICD-10-CM
Billable Codes	14,567	69,823
Chapters	19	21
Code Length (excl. period)	3-5 characters	3-7 characters
First Character	E, V, or 0-9	A-Z, excl. U
Other Characters	Numeric	See above
Ability to Add New Codes	Very Limited	Unrestricted
Ability to Provide Detail	Limited	Unrestricted

Figure 3. ICD-10-CM code character description and ICD version comparison. From "Leveraging the NLM Map From SNOMED CT to ICD-10-CM to Facilitate Adoption of ICD-10-CM" by F. P. Cartagena, M. Schaeffer, D. Rifai, V. Doroshenko, and H. S. Goldberg, 2015, *Journal of the American Medical Informatics Association*, Advance online publication, p. 4. Reprinted with permission (see Appendix B).

ICD-10-CM not only has more codes, but it also has many more code combinations available with the seven-digit alphanumeric structure. Moreover, the new codes will be structurally different from the ICD-9-CM codes (Talebian, 2014). Therefore, there are many more levels of codes in ICD-10-CM, with a higher potential to reveal more detail from abstracting clinical information from the medical record. As a result, this addition will also increase the need for improved accuracy and specificity in

clinician documentation (Henley, 2013). Also, due to having more codes and more characters, the ICD-10-CM set contains more chapters (i.e., 21 versus 17 in the ICD-9-CM). The increase in chapters denotes that ICD-10-CM provides more topics and category choices for coding diagnoses, illness, and injuries (Cartagena, Schaeffer, Rifai, Doroshenko, & Goldberg, 2015)

ICD-10-CM specificity. The ICD-10-CM coding system contains more diagnosis codes, enables greater specificity, and facilitates providers' ability to capture the severity of a patient's condition (Rubenstein, Painter, Painter, Schoor, & Baum, 2014a). ICD-10-CM codes are between three to seven characters long and indicate the disease category, followed by the related etiology, anatomic site, severity, and other vital clinical details (Lindsey, 2013). The seventh character is one of the three letters to indicate if the visit is the initial encounter, subsequent encounter, or sequela (CMS, 2014b).

Lamb (2014) explained that the addition of characters in ICD-10-CM codes would permit precise information about the patient's illness. Henley (2013) described the benefits of characters in the new system, but also noted that the enhancements include improvements in the description and terminology of diagnoses to reflect modern medicine and new clinical concepts. For example, Louis (2013) noted the use of the ICD-9 code, 333.1, essential and other specified forms of tremor, results in the grouping of broad ranges of other conditions aside from essential tremor. However, in ICD-10-CM, code, G25.0, essential tremor, results in grouping patients diagnosed with the particular condition. The use of a particular code for essential tremor will enable the medical community to identify the severity and patterns of the disease, including outcomes of

treatments. Greater detail and specificity offer the ability to discover previously unrecognized clinical patterns (Gevirtz, 2013).

Transition Barriers

While providers will eventually see many benefits, converting to ICD-10-CM will force them to make workflow and operational changes (Krive et. al., 2015). Talebian (2014) argued that a significant amount of concern and resistance remains in transitioning to the ICD 10-CM coding system. Similar to Talebian, Fleming et al. (2015) reported that physicians, administrators, and coders perceived the change as overwhelming. For example, in a qualitative study conducted by Watzlaf et al. (2015), physicians expressed concerns about transitioning to ICD-10-CM. Their concerns included clinical documentation, compliance, and reimbursement. Frequent themes produced from NVivo 10.0 related to specificity, fear, laterality, complexity, and benefits (Watzlaf et al., 2015). Similar to Carpentier's (2012) findings, providers fear the potential increased liability under the False Claims Act due to the transition to ICD-10-CM. Furthermore, Manchikanti, Falco, Kaye, and Hirsch (2014) explained that although the ninth and 10th revisions of ICD are similar in the hierarchy, the ICD-10-CM system is more complex with many changes. For example, in ICD-9-CM, code 721.0 describes "cervical spondylosis without myelopathy." ICD-10-CM changes to nine separate codes to include a detailed description of the location of the injury as shown in Figure 4.

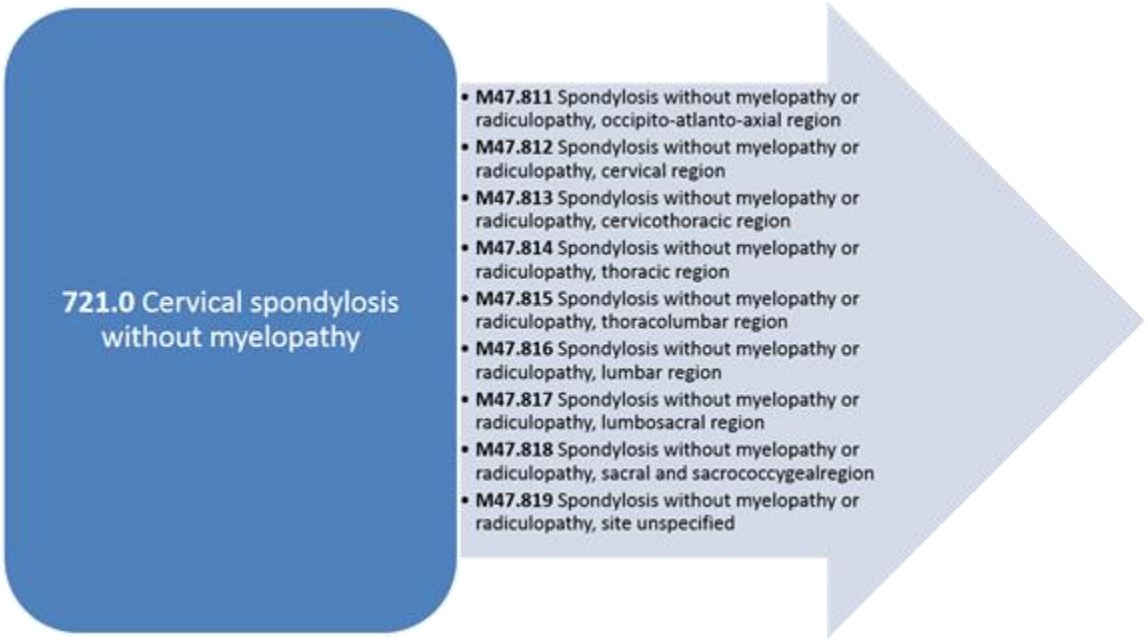


Figure 4. ICD-9-CM and ICD-10-CM code comparison.

Topaz et al. (2013) discussed how more detailed descriptions of the ICD-10-CM system provide benefits in describing patient encounters. Jackson and Muckerman (2012) also acknowledged advantages of specificity but noted that survey participants expected that the granularity of the ICD-10-CM codes would improve evidence-based practice and reduce rejected claims. According to Meyer (2011), the granularity offered by the ICD-10-CM provides a more precise coding that more accurately reflects actual patient conditions, as compared to ICD-9-CM. Coustasse and Paul (2013) also noted that the other nations that have converted to ICD-10 realize the benefits of accurate reimbursement for levels of acuity.

The transition to the new standard is a significant transformative change in HIM that will have dramatic impacts on the financial, operational, and clinical sides of all healthcare entities. The change to the ICD-10-CM will affect virtually all core business

systems for providers, which involves assessing every process and system that uses an ICD-9-CM code or description (Rubenstein et al., 2014b). Cascardo (2015) alluded to operational glitches during the transition that can lead to payment delays and claim denials. The following section is a review of the literature on transition barriers to ICD-10-CM for group practices.

Change resistance barriers. An ongoing debate is whether there is a need and if the timing is appropriate to implement the ICD-10-CM coding system. Manchikanti et al. (2011) deliberated on whether the timing was suitable for the industry to convert to the ICD-10-CM code set. The National Committee on Vital and Health Statistics (NCVHS) expressed concerns about the ICD-9-CM code set 25 years ago (Bowman, 2014). Salcido (2015) noted that although the United States considers ICD-10-CM as a new system, the development of ICD-10-CM began in 1993 and released in Europe and other countries. Bowman also explained that in 1990 the NCVHS sent a letter to the Secretary of the HHS recommending the adoption of the ICD-10-CM. Averill and Butler (2013) pointed out that from 1994 to 2003, NCVHS spent nine years accepting and applying public input to develop the ICD-10-CM coding system for the United States.

Other regulatory requirements have also created a challenge to transition to ICD-10-CM. These include meaningful use (MU), the Patient Protection and Affordable Care Act (PPACA), accountable care organizations (ACOs), physician quality reporting system (PQRS), and value-based purchasing (VBP). Jackson and Muckerman (2012) found that providers were worried about other regulatory requirements, including MU, and explained that implementing MU while transitioning to ICD-10-CM/PCS was

challenging. Chute, Huff, Ferguson, Walker, and Halamka (2012) suggested that CMS delayed the transition to ICD-10-CM because of MU. While Fleming et al. (2015) suggested that the delay was due to the technological, operational, and financial impacts of the new system. The HHS postponed the implementation to ICD-10-CM/PCS twice to October 1, 2015 (Topaz et al., 2013).

Another change resistance barrier is physician buy-in. Jackson and Muckerman (2012) noted that their study participants expressed the importance of physician involvement, as accurate documentation is the cornerstone for ICD-10- CM transition success. However, some providers view the change as excessive clinical requests. Houser, Morgan, Clements, and Hart-Hester (2013) identified benefits of physician buy-in, but also noted the need for involvement of administrative and clinical staff to support the transition. Despite these advantages, Manchikanti et al. (2011) suggested that the transition to ICD-10-CM also raises potential provider challenges, including loss of productivity from physicians.

Furthermore, the ICD-10-CM is a vehicle for international collaboration, a system used by 153 countries (Coustasse & Paul, 2013). One of the last countries to switch was Canada, which began adoption of the ICD-10 Canada (ICD-10-CA) in 2000 (Manchikanti et al., 2011). The implementation of the ICD-10-CM is a critical step in the continued progress of the U.S. healthcare system to compare utilization and treatment outcomes to other countries.

Financial barriers. The cost of the transition is a pressing concern for providers. The cost of the change from ICD-9-CM to ICD-10-CM explained by Rahmathulla et al.

(2014) includes reviewing practice management billing software, training staff, and hiring consultants. Coustasse and Paul (2013) described the cost of the transition as substantial and noted that the America Medical Association (AMA) fears the cost as an implementation barrier to the ICD-10-CM in the United States.

Manchikanti et al. (2011) revealed that the unfunded healthcare mandate of ICD-10-CM would increase the physicians' cost of providing healthcare. Sanders et al. (2012) explained that the estimated cost associated with transitioning to ICD-10-CM/PCS would exceed $25,000 per physician, depending on the size of the hospitals and physician offices; while Manchikanti et al. (2011) further noted that the cost per physician would range from $25,000 to $50,000. The average cost for a three-doctor practice is $83,000, the cost for a 10-doctor practice is $285,000, and the cost for a 100-doctor practice is $2.7 million (Manchikanti et al., 2011). The estimated cost for the physician groups to implement ICD-10-CM is $83,292 to $2.7, million depending on the practice size (Hirsch et al., 2014). Coustasse and Paul (2013) explained that the conversion could cost as much as $8 billion in the United States. Coustasse and Paul further demonstrated that staff training, systems upgrades, and contract negotiations would incur most of the costs of the implementation. Bloomrosen, Bowman, and Zender (2014) noted that while the expense of the transition is substantial, the new system would outweigh the cost by providing better data for evaluating and improving the quality of care. As all of this research indicates, the implementation of the new classification system will include a financial investment for providers.

Training barriers. Training will be one of the critical areas impacted by the adoption of ICD-10-CM. Rahmathulla et al. (2014) and Meyer (2011) noted that the transition to the ICD-10-CM requires staff training, and providers would have to decide the best way to train their personnel. In an interview with a coder, Schaum (2015) recommended training all levels of employees whose responsibilities include diagnosis coding. Sanders et al. (2012) described that ICD-10-CM will require coders to learn a complex coding system; which may be intimidating and can lead to a shortage of qualified coders. Coder shortage can result in backlogs, which could result in a reduction of collected revenue (Sanders et al., 2012).

The transition to ICD-10-CM may affect coder productivity. Harris and Zeng (2012) discussed the need for training, but also mentioned that training will help to mitigate the loss of future productivity. Other countries that have transitioned to a modified version of ICD-10 reported productivity loss in the initial stages of *go-live* (when the system is launched). For example, Canada's productivity decreased 50%, with ICD-10 productivity never returning to ICD-9 productivity standards as shown in Table 1 (Johnson, 2004). While Innes, Peasley, and Roberts (2000) did not report specific productivity decreases for Australia, they noted that it took 12 weeks from ICD-10 go-live, to return to ICD-9 productivity standards.

Table 1

Coding Productivity Pre- and Post-ICD-10 Implementation

	ICD-9-CM (April 2002)	**Start ICD-10 (July 2002)**	**ICD-10 (April 2003)**
Inpatient	4.62	2.15	3.75
Day surgery	10.68	3.82	8.53
Emergency	10.37	6.49	8.83

Note. The table illustrates coding productivity numbers from Humber River Regional Hospital, Toronto, Ontario, Canada. From "Implementation of ICD-10: Experiences and lessons learned from a Canadian hospital," by K. Johnson, 2004, IFHRO Congress & AHIMA Convention Proceedings, Copyright (2004) by the American Health Information Management Association. Reprinted with permission (see Appendix C).

Stanfill, Hsieh, Beal, and Fenton (2014) revealed that coding in the ICD-10-CM/PCS systems took 69% longer than in ICD-9. At best, coders with the most training in ICD-10-CM/PCS took 54.4% longer. Furthermore, Stanfill et al.'s findings indicated a positive return on investment for staff training time. Participants with more than a week of ICD-10-CM/PCS training experienced the lowest productivity loss at 54.4% while those with only 10 to 12 hours of ICD-10-CM/CPS training experienced an 81.8% productivity loss. The study supports the notion that initial coding productivity using the ICD-10 system will be lower than current coding productivity using the ICD-9 system (Stanfill et al., 2014).

Physician and clinician training will play a vital role in the transition to ICD-10. Fifty percent of providers expressed that training was the most important component of the ICD-10-CM/PCS transition (Jackson and Muckerman, 2012). As noted by the American Health Information Management Association (AHIMA; 2014), the level of

training for physicians and clinicians depends on their coding role in their practice. For example, if the doctor or clinician do not code, then training will address documentation. Sanders et al. (2012) noted that clinical documentation would change due to the conversion to ICD-10-CM. Moreover, if the physician or clinician codes charts, then the training would include documentation as well as coding guidelines.

Loftus, Najafian, Pandey, and Ramanujam (2015) assessed the impact of documentation training for colorectal surgeons. Table 2 depicts the five key documentation concepts provided in the 1-hour in-person tutorial. Findings from the study revealed documentation improvement for anemia and hypokalemia after the training.

Table 2

Five Key Documentation Tips

Documentation Tip	Example
If it is documented, then it will be coded.	Coders can use any diagnosis to identify complications associated with the operation. If the patient's potassium is low by laboratory standards but it is not clinically significant, then physicians will oftentimes document this for completeness, which is not necessary since it does not impact care.
Do not document a condition unless it is clinically significant, requires additional treatment and/or prolongs LOS.	Many patients following an abdominal procedure will have a "physiological ileus" which is an expected part of the procedure and does not require documentation. If the ileus persists and leads to a longer length of stay, then it is a "pathological ileus" and should be documented.
If it is clinically expected, state it.	If a patient undergoes a Hartmann's procedure for perforated diverticulitis and is being admitted to the Intensive Care Unit for management of respiratory failure "due to" septic shock "due to" perforated diverticulitis, then state this in the operative report or progress note. Don't assume the coder will make this clinical connection. If they don't, then the respiratory failure may get counted as a complication of your operation.
If it is present on admission, state it.	If a patient undergoes a colectomy for colon cancer and was anemic prior to the operation, then be sure to associate the post-operative anemia as being "due to" the present on admission diagnosis of anemia "due to" colon cancer (i.e. anemia in neoplastic disease). This assumes there wasn't a clinically significant event (acute post hemorrhagic anemia) to explain the post-operative anemia.
Be aware of consultant's notes.	Consultants can be helpful in the management of patients, however remember to review their notes and make sure they are not documenting events that are not clinically significant.

Note. From "The Impact of Documentation Training on Performance Reporting" by T. Loftus, H. Najafian, S. R. Pandey, and P. Ramanujam, 2015, *Cureus, 7*(7), p. 2. Reprinted with permission (see Appendix D).

In a survey conducted by Watzlaf et al. (2015), physicians identified training as a requirement for ICD-10-CM/PCS. Some of the needs included (a) proper coding and documentation requirements; (b) training by professional associations for residents and physicians; and (c) development of accessible training materials to help educate physicians (Watzlaf et al., 2015). Sanders et al. (2012) also acknowledged the need for physician and clinician training, but also noted training will simplify the level of specificity required for documentation. Manchikanti et al. (2013) further noted that physician practices productivity losses are dependent upon training obtained by the doctors and staff.

The evidence suggests that providers will have to concentrate their efforts on training staff, which includes coders, physicians, and other key personnel members. The ICD-10-CM education may require adding extra training programs to already existing ones as well as updating existing training programs to reflect the changes (Meyer, 2011). More importantly, because coders play a vital role in provider revenue cycle, managing the delivery of training will be essential for retaining qualified coders and migrating productivity.

Clinical documentation barriers. With the initiation of public reporting of clinical performance for physicians, the need for accurate documentation is crucial. Besides the transition to ICD-10-CM, in 2010, the Affordable Care Act (ACA) required CMS to create a physician comparative performance database for public reporting (Loftus et al., 2015). The data used for reporting is coding data from the clinical documentation in each patient's chart.

Some physicians perceive the conversion to the new system as hard to use due to increased required detail for clinical documentation. Rubenstein (2015) suggested that new system might increase the "time per patient encounter" (p. 4) due to the increased documentation required. According to Watzlaf et al. (2015), physicians explained that clinical documentation specificity was burdensome for their practices. Watzlaf et al. further noted that the increased specificity in the ICD-10-CM code set might lead to increased levels of documentation as shown in Figure 5. For example, ICD-9-CM describes asthma as extrinsic or intrinsic. ICD-10 CM describes asthma by severity and frequency (i.e., mild intermittent, mild persistent, moderate persistent, severe persistent) and the presence of status asthmaticus or acute exacerbation.

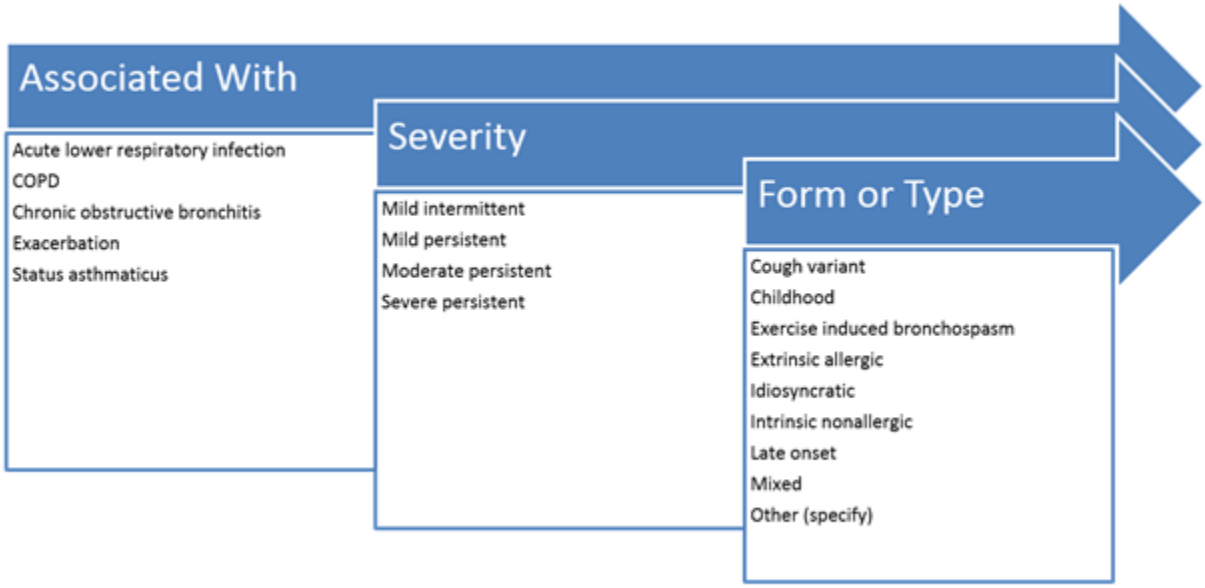


Figure 5. Clinical documentation requirements for asthma in ICD-10-CM.

Jodock (2015) further explained that in ICD-9, documenting of stroke was sufficient for coding; however, in ICD-10, documentation of stroke must indicate the

location of the stroke, specifically, right, left, middle, interior, or posterior of the cerebral artery. As such, Rubenstein et al. (2014) argued that the transition would change how clinicians documented in the medical record. DeAlmeida et al. (2014) acknowledged advantages of ICD-10-CM, but also suggested that to implement ICD-10-CM, users need to be aware of the detailed documentation requirements. The benefits of complete documentation using ICD-10-CM include reducing claim rejection and accurate revenue recognition.

Understanding the impact of the expanded documentation requirement to transition to ICD-10-CM is vital for providers. Watzlaf et al. (2015) revealed that some physicians have concerns about transitioning to ICD-10-CM and the implications of increased documentation. In contrast, some physicians believe either that the changes will not affect their current documentation or that they are already compliant with ICD-10-CM documentation requirements (Watzlaf et al., 2015). According to Rubenstein et al. (2014a), providers should expect a 3% to 4% increase in the provider time documentation.

DeAlmeida et al. (2014) conducted a quantitative descriptive study to identify the barriers related to ICD-10-CM documentation specificity. The researchers reported a total of 10 chapters with the highest percentage of missing documentation. These include chapter 7 (Diseases of Eye and Adnexa), with 67.65%; chapter 8 (Diseases of Ear and Mastoid Process), with 63.64%; chapter 13 (Diseases of the Musculoskeletal System and Connective Tissue), with 46.05%; chapter 14 (Diseases of the Genitourinary System), with 40.29% (DeAlmeida et al., 2014). Complete and accurate documentation would

benefit both the clinician and the patient in providing the highest quality of care. DeAlmeida et al. identified 736 diagnosis codes with missing documentation, generating an overall absent documentation of 15.4%.

Moczygemba and Fenton (2012) conducted an exploratory pilot study to determine whether current levels of clinical documentation would support ICD-10-CM codes. For heart disease, findings revealed that 86% of records had an unspecified ICD-10-CM heart disease code assigned. There were 1,180 unspecified codes assigned, which accounted for 27.6% of the total codes assigned (Moczygemba & Fenton, 2012). These findings suggest the importance and need of capturing greater specificity for clinical documentation, particularly for heart disease.

Based on the on findings of DeAlmeida et al. (2014) Moczygemba and Fenton (2012), the researchers concluded that providers could not presume that the current clinical documentation contains the detail needed for ICD-10-CM. Consequently, payers will demand improved documentation to support the code choice, and failure to do so may lead to rejections or delay in payment while reviewing medical records (Rubenstein et al., 2014b). To assist providers with ICD-10 preparations, CMS (2015a) has stated that they will not deny claims exclusively based on the lack of specificity of the ICD-10-CM codes. The flexibility in the claims denials will help to ease physicians' transition process. Providers have a year after the go-live date to build upon their coding accuracy before CMS takes action (CMS, 2015a). While CMS (2015a) will be flexible about denials, other payers may not; providers will still need to prepare for the transition.

Healthcare providers will need to ensure the inclusion of ICD-10-CM diagnosis codes into the physician's daily workflow.

Information technology barriers. The transition to ICD-10-CM has created concerns in the medical community, including the cost and impact of technology upgrades. Jodock (2015) indicated that the change to the ICD-10 system requires remediation of every technology system touched by an ICD-10 code. While proponents describe ICD-10-CM as a better system, it will require system preparation for the new structure, including field size expansion and the conversion to the alphanumeric structure (Boyd et al., 2013). Opponents of ICD-10-CM discussed that beyond the financial expense, it is also costly to implement and upgrade hardware and software (Manchikanti et al., 2011). Rubenstein (2014) noted that private practices would need either new hardware or new software or both. Venepalli, Shergill, Dorestani, and Boyd (2014) similarly agreed that the vast majority of the transition costs arise from technology upgrades. Manchikanti et al. (2011) estimated the overall software cost for smaller or solo practices at $180 million. The cost includes upgrades to the EHRs and practice management (PM) systems.

EHR & PMR systems. Another transition consideration is the use of EHRs and the impact of ICD-10-CM codes on those systems. Although some EHR software upgrades automatically, providers will still need to determine whether the EHR and PM will require updates and if the system meets the demands of ICD-10-CM (Rubenstein, 2014). Rahmathulla et al. (2014) similarly mentioned the impact of EHRs, but also noted that software vendors need to be timely with updates to allow for systems testing. Most

practices depend on the vendor for major technology upgrades for coding systems (Houser et al., 2013). According to Watzlaf et al. (2015), participants acknowledged that their EHRs would require an upgrade for the ICD-10-CM transition. Management may need to evaluate the impact on IT infrastructure and collaborate with vendors to test their software systems to ensure ICD-10-CM processing. Software must accommodate the complex code structure of ICD-10-CM, including the storage capacity of the codes, and an accurate and robust code search feature.

Billing and Reimbursement

Diagnosis coding is a vital function in the physician billing process. For the past three decades, the U.S. healthcare industry has used the ICD-9-CM code set for reimbursement and public health reporting (CMS, 2014a). Accurate and timely coding ensures appropriate billing and payment for healthcare services. As such, diagnosis coding is a vital part of sustainability in healthcare operations (Storrow & Collins, 2015).

Watzlaf et al. (2015) reported that some physicians downcode patients' diagnoses to avoid ramifications such as rejections and audits. The researchers also noted that doctors identified proper billing practices as an area for training and education for the ICD-10-CM transition. Notably, 75% of the physician participants did their coding (Watzlaf et al., 2015). As previously discussed, doctors or clinicians who perform their coding will require documentation as well as coding guidelines training on ICD-10-CM.

Providers pay particular attention to coding accuracy as reimbursements are dependent upon services that are medically necessary. Lack of preparedness may result in a loss of revenue, decreased cash flow, coding backlog, and medical claim rejections

(McNicholas, 2014). For example, Caskey et al. (2014) conducted a study in Illinois for Medicaid, and found 26% of diagnostic codes, which represents 21% of pediatric patient encounters and 16% of reimbursement, as convoluted. Thus, Caskey et al. suggested that the transition to ICD-10-CM is complex (see Figure 6). Among the complex mappings, the researchers categorized the codes as (a) information loss, (b) overlapping categories, and (c) inconsistent. Caskey et al. reported convoluted diagnosis codes represented 8% ($1,011,260) of Medicaid pediatric reimbursement (see Table 3). A similar study by Boyd et al. (2013) reported 31% of the diagnosis codes, which represents 28% of emergency department encounters and 27% of costs, as convoluted.

As the industry transitions to the new ICD-10-CM coding system, providers will need to continue to manage the coding and billing process for financial stability. The findings from Caskey et al. and Boyd et al. suggest the potential for financial and operational disruption. Caskey et al. (2014) noted that billing errors could have a substantial economic impact. Proper planning for the transition to ICD-10-CM is vital for providers to mitigate billing disruptions.

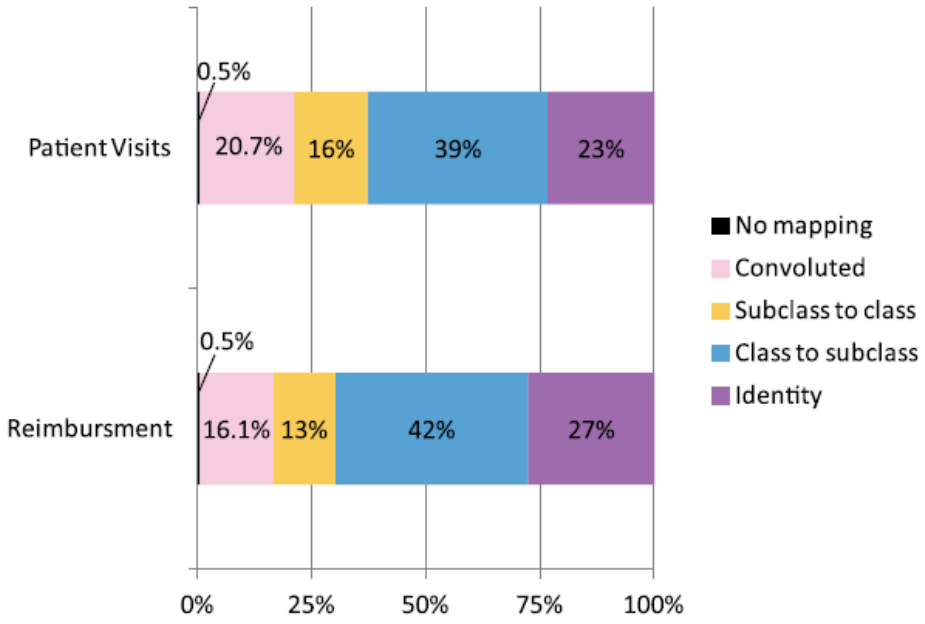


Figure 6. Percentage of patient visits and reimbursement associated with the coding categories. From "The Transition to ICD-10-CM: Challenges for Pediatric Practice" by R. Caskey, J. Zaman, H. Nam, S. R. Chae, L. Williams, G. Mathew, . . . and A. D. Boyd, 2014, *Pediatrics*, *134*(1), p. 4. Reprinted with permission (see Appendix H).

Table 3

Pediatric ICD-9-CM Codes in Illinois Medicaid

	Number of Analyzed Codes[a] (*N* = 636)	Codes Analyzed, %	Total Illinois Medicaid Diagnosis Codes, %	Reimbursement (% of Total Reimbursement)
Information loss	88	14	2.5	$455 320.84 (3.6)
Overlapping categories	115	18	3.2	$399 302.13 (3.2)
Inconsistent	42	7	1	$156 637 (1.2)
Consistent	385	61	10	$1 970 000 (15.7)
Unanalyzed transition	—	—	83.3	$9 300 000 (75)

Note. The last row represents the percentage of codes and costs that were not analyzed by the pediatricians. Overlapping categories at 3.2% of codes and 3.2% of overall cost is the largest contributor to clinically incorrect concepts. From "From "The Transition to ICD-10-CM: Challenges for Pediatric Practice" by R. Caskey, J. Zaman, H. Nam, S. R. Chae, L. Williams, G. Mathew, . . . and A. D. Boyd, 2014, *Pediatrics*, *134*(1), p. 5. Reprinted with permission (see Appendix H).

Superbill conversion. Conversion of the superbill form to reflect ICD-10-CM codes is an important transition step. Beckman (2012) defined a superbill as "a list of the most common diagnosis codes for the physician to check" (p. 26). Doctors and clinicians commonly use superbill forms at the point of checkout to indicate services rendered for billing. McNicholas (2013) recommended that management assesses how the organization is currently using ICD-9-CM codes, including superbill use. Beckman reported that a one or two-page superbill would not be sufficient for ICD-10-CM, given the expansion of the new codes. Rubenstein (2014) noted that a practice might use an adequate superbill, but also recommended learning the ICD-10-CM code as best practice. The findings from McNicholas, Beckman, and Rubenstein support the need to assess superbill forms for provider organizations.

Billing noncovered entities. The transition to ICD-10-CM is a legislative mandate for covered entities identified by HIPAA (CMS, 2014b). These entities include health plans, healthcare clearinghouses, and healthcare providers. According to CMS (2014c), the transition to ICD-10 CM is not required for noncovered entities. Richmond (2012) explained that the exempt noncovered entities include worker's compensation, property and casualty insurance plans, and prison health system. Bowman and Leon-Chisen (2011) further noted that disability insurance programs, life insurance companies, and automobile insurance firms that submit paper claims are not required to transition to the ICD-10-CM code set. As a result, this further complicates the transition to ICD-10-CM for physician practices that submit medical claims for reimbursement to noncovered entities.

Understanding the nuances of the change to ICD-10-CM is vital for healthcare organizations. Though CMS (2014c) recommended noncovered entities to transition to the ICD-10-CM code set, those entities are not required to convert to the new system. Providers that currently submit claims to noncovered entities will need to verify which payers will be switching to ICD-10-CM codes. Richmond (2012) explained that providers that submit claims to non-HIPAA entities may have to continue to use ICD-9 for non-HIPAA-covered payers and ICD-10 for those covered under HIPAA. Providers will need to treat noncovered entities differently for billing and coding. Furthermore, as explained by Bowman and Leon-Chisen (2011), supporting dual processing billing systems to continue using ICD-9-CM codes for claims past the implementation date by providers and payers will be expensive.

It may be to the benefit of noncovered entities to upgrade to the new system, especially for workers compensation plans, as diagnosis codes are the driver of their claims. The CMS (2014c) explained it may be in the non-covered entities' best interest to embrace the ICD-10-CM transition because of the expanded detail in injury codes. Similarly, Bowman (2014) described how the benefits of adopting ICD-10 will outweigh the challenges of implementation for non-covered entities. The new system will allow for better analysis of disease patterns and treatment outcomes (CMS, 2014c). Additionally, HHS will not maintain the ICD-9-CM once the industry transitions to ICD-10-CM; thus, the usefulness of the ICD-9-CM will rapidly decline (CMS, 2015b)

As discussed, not every healthcare organization is required to comply with the federal mandate for ICD-10-CM implementation. While preparing for the switch to ICD-

10-CM transition, providers should examine claims billing for non-HIPAA entities. If some noncovered entities chose not to transition to ICD-10-CM, providers would need to plan to continue to use ICD-9-CM codes for billing to ensure reimbursement. Distinguishing which diagnosis set to use—ICD-9-CM or ICD-10-CM—for payment in the provider's office, based on patients' insurance coverage, can be potentially challenging for management.

Unintended costs and consequences. Another argument for the transition to the ICD-10-CM is that beyond the financial investment, the change has the potential for unintended consequences and costs. Manchikanti et al. (2011) noted that the granularity of the ICD-10-CM code set could lead to excessive investigations, which can cause operational and billing disruptions for private physician practices. CMS also acknowledged the issue of cash flow interruptions with the implementation of the ICD-10-CM (as cited in Hirsch et al., 2014). Furthermore, the unexpected cost of audits, defense, and fines will contribute to provider cash flow disruptions (Manchikanti et al., 2014). However, CMS (2015a) stated, "When the Part B Medicare contractors are unable to process claims within established time limits because of administrative problems, such as contractor system malfunction or implementation problems, an advance payment may be available" (p. 2). If Medicare is unable to process claims as the result of the transition to ICD-10-CM, CMS (2015a) will authorize advance payments. While CMS (2015a) will assist providers to minimize payment disruptions, other payers may not, providers will still have to prepare for the transition.

Increased Number of Codes

The increased number of ICD-10-CM codes, as compared to ICD-9-CM, is a concern for providers. The new system, ICD-10-CM, contains approximately 70,000 codes, an increase of 479% when compared to the ICD-9-CM diagnosis code set (Rahmathulla et al., 2014). Manchikanti et al. (2011) described the new system as complicated. Nonetheless, physicians will not use the ICD-10-PCS code set to report procedures, as the use of PCS is for hospital reporting of inpatient services. Rather, physicians will continue to use the common procedural terminology (CPT; Averill & Butler, 2013) to report services.

Physicians will continue to use a limited number of codes within their specialty. No physician will ever use all 70,000-diagnosis codes. As noted by Bowman (2014), and Averill and Butler (2013), assuming the complexity of the of ICD-10-CM solely based on the number of codes, is like thinking the English language is complicated only based on the 470,000 words in the Webster's dictionary. Even though the language is complex and contains many words, people do not need to use all the vocabulary to use the language effectively. Averill and Butler (2013) further clarified that physicians and other providers will only use the subset of ICD-10-CM codes that are relevant to their specialty, just as they did for ICD-9-CM. For example, a pulmonologist will mainly use codes from the respiratory chapter of the ICD-10-CM, just as in ICD-9-CM.

The increase in the number of the ICD-10-CM codes is primarily due to the addition of location specification of laterality. The ICD-10-CM version presents features that are not available in ICD-9-CM. Manchikanti et al. (2011) asserted that the ICD-10-

CM code set introduces a monumental new set of diagnostic codes. While it may seem that the ICD-10-CM code set contains an excessive number of codes compared to ICD-9-CM, Bowman (2014) and Averill & Butler (2013) highlighted that the primary reason for much of the code expansion is due to ICD-10-CM having separate codes for left and right body parts. Additionally, Averill and Butler noted that the removal of left and right distinctions from the ICD-10-CM codes would result in 25,626 fewer codes, a 46% decrease in the number of codes. Providers will need to tailor ICD-10-CM training to the subset of codes relevant to the organization's patient population.

The development of the ICD-10-CM code set included clinician input. Bowman (2014) explained that organizations representing physicians demanded that the ICD-10-CM codes provided greater clinical detail than the ICD-9-CM. According to Averill and Butler (2013), the medical and surgical specialty groups reviewed the ICD-10-CM code set and provided clinical input during the development phase. For example, the addition of trimester of pregnancy was requested by the American College of Obstetricians and Gynecologists. The inclusion of the Glasgow coma scale was required by the American Academy of Neurology as well as more specific codes relating to cerebrovascular diseases (Rubenstein, 2014). Rubenstein (2014) also explained that the development of ICD-10-CM included an advisory panel of physician groups, clinical coders, and others to ensure clinical accuracy. In spite of medical and surgical specialty groups involvement, Manchikanti et al. (2011) pointed out the limited involvement with practitioners of day-to-day medical practices for the development of ICD-10-CM.

Methodologies Considerations

I used a qualitative, case study design to explore strategies providers used to overcome barriers to transition to the ICD-10-CM coding system. A review of the academic literature supports the chosen design and aligns with other researchers who examined similar phenomena. In this section, I will discuss the methodology and design of selected articles from my literature review.

Watzlaf et al. (2015) conducted a qualitative, focus group study to explore 12 physicians' perceptions of the change to ICD-10-CM/PCS. Top concerns included (a) EHR readiness, (b) increase in documentation specificity and time, and (c) the inadequacy of current training methods and content. According to the 12 physicians, the transition to ICD-10-CM will affect how they run their practices. The participants also revealed the importance of specialty based ICD-10-CM training. Common themes identified by NVivo 10.0 software from transcribed data included specificity, fear, laterality, complexity, and benefits. The findings from Watzlaf et al.'s study provide a perspective on the transition to ICD-10-CM from independent physicians.

Jackson and Muckerman (2012) conducted a qualitative case study to identify common trends and challenges of the transition to ICD-10-CM/PCS code set. The researchers conducted seven interviews with department heads, senior staff members, and project managers leading ICD-10-CM/PCS conversion efforts from seven diverse health systems. The trends and challenges stated by the participants included (a) training as the most significant and costly component of the transition; (b) improvements in clinical quality with adoption of ICD-10-CM/PCS; (c) securing widespread physician buy-in; (d)

coordinating ICD-10-CM/PCS transition initiatives with payers; and (e) productivity losses associated with ICD-10-CM/PCS training. The findings from Jackson and Muckerman's study identify trends and challenges from leaders managing the readiness of hospitals to ICD-10-CM/PCS.

Moczygemba and Fenton (2012) conducted an exploratory pilot study to determine whether current levels of clinical documentation would support ICD-10-CM coding for heart disease, pneumonia, and diabetes. The coders and quality assurance reviewer coded 491 unidentified records in ICD-10-CM. More than 25% of the codes assigned were unspecified. The assignments of unspecified codes were frequent for heart disease and pneumonia. To assign a particular code, detailed documentation from the physicians is required. The findings from Moczygemba and Fenton's study provide insight of the complete clinical documentation needed to capture specific types of heart disease and pneumonia.

While most of the studies I reviewed in the literature review were qualitative, some used a quantitative approach to understanding the prevalence of the ICD-10-CM/PCS transition. Houser et al. (2013) conducted a quantitative, structured interview study to examine readiness, planning, and the challenges and barriers of ICD-10-CM/PCS for hospitals in the state of Alabama. Of the surveys sent through Surveymonkey.com to HIM directors, the researchers received 43 completed surveys. Approximately 77% of the respondents indicated "they would train coders in advance to minimize the impact; others would adjust coders' productivity measures" (Houser et al., 2013 p. 4). The top three challenges and barriers revealed by the participants to the ICD-

10-CM/PCS transition were (a) the need to interact with physicians; (b) the need for education and training for coders and; (c) dependence on vendors for technology upgrades. The findings from Houser et al.'s study provide awareness for providers in establishing practice standards for the transition to ICD-10-CM/PCS.

Watzlaf et al. (2015) reported similar results consistent with Jackson and Muckerman's (2012) and Moczygemba and Fenton's (2012) qualitative studies. While Houser et al. (2013) conducted a quantitative study with HIM participants, the top concerns aligned with the findings from the qualitative studies. The alignment in the findings from the literature supports my intent with this study to identify what strategies providers used to overcome barriers to transition to the ICD-10-CM coding system.

Transition and Summary

Section 1 contained the problem statement and purpose statement, as well as the nature of the study that justified using a qualitative case study design. Section 1 also included the (a) interview questions, in addition to the (b) conceptual framework, (c) assumptions, (d) limitations, and (e) delimitations of the study. Section 1 concluded with the significance of the study and a review of the professional and academic literature. The review of the literature began with an in-depth discussion of the conceptual framework—TAM—including healthcare studies that have included the theory and alternative theories as well as rival theories. The literature review also included a section addressing the legislation and closed with a discussion of ICD-10-CM transition barriers for provider organizations. A map diagram of the structure of the literature review for this study is shown in Figure 1.

The purpose of the study was to explore strategies providers used to overcome barriers to transition to the ICD-10-CM coding system. Section 2 includes (a) the project purpose, (b) the role of the researcher, (c) the selected participants, (d) a detailed description of the research methodology and design, (e) the population and sampling, (f) ethical research, (g) data collection instruments and technique, (h) data organization technique, (i) data analysis, and (j) reliability and validity. Section 3 contains an introduction including the purpose statement, research question, and findings. Section 3 also includes (a) application to professional practice, (b) implications for social change and behaviors, (c) recommendations for action and further study, and concludes with (d) researcher reflections.

Section 2: The Project

The transition to ICD-10-CM presents an implementation challenge for providers, which could be financially devastating if not done correctly (Rubenstein et al., 2014a). Therefore, it is paramount for providers to be aware of successful implementation strategies for their organizations. Section 2 includes a complete summation of the qualitative single case research design employed in the study. The section begins with the purpose statement, a review of my role as the researcher, and an overview of the data collection instrument, collection techniques, data organization, and the data analysis techniques. The in-depth review includes the role of participants, along with details of the population, census sampling method, and design for rigorous reliability and validity. Most significantly, section 2 includes specifics regarding the ethical basis for the research, protections of participants' rights, and a thorough discussion of the informed consent process.

Purpose Statement

The purpose of this qualitative single case study was to explore strategies providers used for overcoming barriers to transition to the ICD-10-CM coding system. The targeted population consisted of participants of a public health organization in the southern region of Florida, including a health information manager, coders, and physicians. Similar to Borges et al. (2009), I used document reviews, interviews, and direct observations to achieve study credibility and enhance the quality of this case study. Finding triangulation included data gathered from all three sources. The implication for positive social change includes supporting providers through a legislated change with

transition insights, including the potential to document best practices and to improve public health reporting (Guffey & Duchek, 2013). Moreover, the successful conversion may support the long-term success of future healthcare reforms.

Role of the Researcher

My role in this qualitative case study was to collect, analyze, and interpret the data, and gather results from participant interviews and archival data without prejudice. Wahyuni (2012) advised that the role of the researcher is to facilitate participant sharing of perspectives regarding the phenomena. Turner (2010) noted that data and detailed feedback collected from participants support qualitative research. According to Yin (2014), the researcher should be accepting of results that are contrary to expectations to help avoid bias. Hancock and Algozzine (2011) suggested that the researcher should be cognizant of biases related to the research topic and actively attempt to identify preferences to ensure the neutrality of conclusions. Thus, I identified personal beliefs and biases regarding the study subject before beginning the document review and participant interview process, and remained cognizant of personal preferences throughout the data analysis process. Notable biases are (a) my belief that ICD-10-CM codes are more comprehensive than ICD-9-CM codes, and (b) my belief that change is hard, and individuals will resist change.

Unbiased interview techniques supported the conduct of all meetings. Conducting unbiased interviews created open space for participants to answer questions. Before interviewing participants, a qualification question was asked to the individuals ensure they met the inclusion criteria. Next, I posed interview questions in a neutral manner and

listened attentively while observing the tone, mannerisms, and any other nonverbal communication expressed by the participant. The semistructured interviews lasted approximately 45 to 60 minutes, and consisted of demographic information and seven open-ended questions about strategies used to overcome barriers to transition to the ICD-10-CM coding system. Participants had the opportunity to respond to each interview question and to offer additional insights about successful strategies used. Also, in an effort to create an ethical environment, the researcher adhered to the Belmont Report. The ethical values in the Belmont Report include (a) respect, (b) beneficence, and (c) justice (Greaney et al., 2012). Following the suggestions of the Belmont Report (HHS, 2015), I used applicable measures that warrant respect for persons, beneficence, and justice.

Participants

It was of high importance in this study to obtain an appropriate sample of eligible participants and ensure informed consent. The participants of this study included a health information manager, physicians, and coders from a public health organization in the South Florida area. Study participants resided in the South Florida area with a minimum of 2 years of experience with the administration, delivery, and operations of a health organization. Simon (2011) suggested selecting participants who would be interested in the study findings. Following Simon's advice, I recruited participants that shared implementation strategies initiatives they used for overcoming barriers to transition to the ICD-10-CM coding system. Managers, clinicians, and coders of provider organizations

are the ideal participants to provide in-depth information regarding implementation strategies to explore the phenomena from their perspective.

The strategies for gaining access to participants were through existing contacts with the Palm Beach County Medical Society as well as through fieldwork. Patton (2002) suggested advanced fieldwork provides access to study sites of a reputable organization. During the interviews, I established a working relationship with the participants by reassuring them of the confidentiality that pertained to the study. As suggested by Marshall and Rossman (2011), I framed initial and follow-up questions in an open-ended manner.

Research Method

I utilized a qualitative research method with a single-case study design. The research method to guide the framework for the exploration of the study research question was the qualitative research method. Stake (1995) asserted the value of qualitative research for understanding management-related issues (phenomenon) from the perspective of study participants. For this study, I explored strategies providers used to overcome barriers to transition to the ICD-10-CM coding system.

The qualitative method was the most suitable research method for this study. Yilmaz (2013) explained qualitative research as a method that allows investigators to search for meaning through open-ended questions. Hanson, Balmer, and Giardino (2011) similarly described the benefits of qualitative research, but also noted that researchers interpret the meaning of participant experiences through themes. Hosseini (2011) further explained that a qualitative method enables the researcher to generate meaning from the

views of individuals applied to particular situations. Use of a qualitative approach to explore strategies that providers used to overcome barriers to transition to the ICD-10-CM coding system is consistent with the application of qualitative methods within the field of business and management research.

Quantitative research centers on the quantification of a phenomenon by examining relationships among variables (Rubin & Rubin, 2012). Mixed methods research is an approach to inquiry that combines both qualitative and quantitative forms simultaneously so that the overall strength of the study is greater than either qualitative or quantitative research (Cameron, 2011). The study objective of understanding implementation strategies used by providers to overcome barriers to transition to the ICD-10-CM coding system did not require the quantification and analysis of factors. Accordingly, I did not select a quantitative or a mixed methods research approach for the study.

Research Design

A case study design supported the conduct of this study to explore strategies providers used to overcome barriers to transition to the ICD-10-CM coding system in Florida. Yin (2014) asserted that case study design supports the exploration of a phenomenon and enables in-depth study. Yin further explained that a case study design allows investigators to explore a phenomenon with a small number of participants. Case study researchers use varied sources of data to develop detailed descriptions of an event (Yin, 2014) including document reviews, observations, and interviews to construct explanations of events (Stake, 1995). Barratt, Choi, and Li (2011) further explained the

value of qualitative case study, but also noted the benefits of assessing a contemporary phenomenon in a real-life context within the field of operations management. Accordingly, I used a case study design to identify and explore strategies that providers used to overcome barriers to transition to the ICD-10-CM coding system.

While I chose a case study design, I also deliberated over other designs. Other qualitative research designs did not support the objective of in-depth case exploration and analysis desired for this study. The application of the grounded theory design would allow the researcher to understand a general theory of a process, based on the views of the participants of the study (Patton, 2002), but would not have allowed for the combining of data collection from documents. A phenomenological theory design is appropriate for examination of the lived experiences of the participants to understand why a phenomenon occurs (Edwards, 2013), a focus that was not suitable for this study. The ethnography design is appropriate for understanding the culture of a group of people (Westney & Van Maanen, 2011). Therefore, I did not select the ethnographic study design because I was not studying a culture or community.

Population and Sampling

There was a census sample of nine participants within the public health organization to secure the inclusion of staff known to have differential access and experiences with the ICD-10 transition. Study participants included managers, clinicians, and coders. The sampling method used in this study was a census. Daniel (2012) noted that users of census research findings attribute credibility of results based on the census research process. Jupp (2006) identified similar benefits of using census sample, but also

mentioned that if every member of the population does not respond to the census, there remains a void as to whether the non-respondents would have given different information on their experiences. The objective of this study was to gather data from observation, documents, and from interviewing participants with experience of transitioning from ICD-9-CM to ICD-10-CM. The interview questions were open-ended to encourage participants to describe their implementation strategies used to overcome barriers.

It was unfeasible to attempt to interview every member employed by the organization for this study; accordingly, the decision was made that census sample of randomly selected participants would provide the best sample to overcome inherent bias. Census sampling, rather than random sampling, was best for this study. The census sample of participants of the organization had to experience the phenomenon in their daily responsibilities. Accordingly, I determined that a minimum pool size of nine participants would be appropriate. Furthermore, I achieved saturation at the completion of the nine interviews. Walker (2012) explained saturation as a point where the information from the participants provides no new data or information. O'Reilly and Parker (2012) further noted data saturation as finding repetition in the data through interviewing. Denzin and Lincoln (2011) described data saturation as a point during the interview process when the information from multiple respondents provide the same data, no new themes emerge, and the study becomes replicable.

Yin (2014) noted sample size should be large enough so that the researcher finds the redundancy of response. In interview research, sample sufficiency and saturation are essential criteria for determining adequate research (Rubin & Rubin, 2012). A sample

census pool of nine participants, producing no new themes or perspectives, signified saturation. Furthermore, using a qualitative case study research design allowed the collection of detailed information on smaller sample sizes, to justify and achieve data saturation (Patton, 2002). O'Reilly and Parker (2013) further explained saturation, but also noted that not reaching saturation means that the research is incomplete.

Ethical Research

Conducting ethical research is fundamental. The Walden University approval number for this study is 10-07-15-0469556. Before data collection, I completed a National Institutes of Health (NIH) web-based training concerning the protection of human subjects while conducting research. My certificate number is 1470066.

The participants received an email or letter introducing the study objectives and intent. The study invitation was a request for participants and included informed consent forms. Once the participants reviewed the research information, they signed an informed consent. The informed consent letter included a statement that the participants could withdraw from the study at any time with no consequences. The participants did not receive incentives in exchange for participation in this study. Additionally, all participants were at liberty to decide to participate based on their interest and experience in the phenomenon and not for an incentive.

Deidentification of participants ensured the privacy of all study participants and their affiliated practices during the data analysis process. Participants only responded to questions that they felt comfortable in answering. Furthermore, participants did not provide information they believed would compromise their professional status.

The signed informed consent forms and documents about this study will be stored in a secure and safe location for 5 years and then destroyed. Soft copy data will be kept in a file on a password-protected computer and deleted after 5 years. A locked container will hold all hard copies of data and analytical materials to protect the rights of study participants.

Data Collection Instrument

I was the chief collection instrument. I collected data from a review of documents as well as through observations of coding activities, and conducted interviews using open-ended semistructured questions to elicit strategies used to overcome barriers to transition from the ICD-9-CM to the ICD-10-CM coding system. The interview questions reflected the research goals of the study (see Appendix F). Marshall and Rossman (2011) suggested using multiple sources of data to support credibility through data triangulation. As suggested by Yin (2014), case study researchers use data triangulation via the collection of information from multiple sources to substantiate the same phenomenon to ensure overall study validity.

According to Yin (2014), a case study protocol consists of (a) an overview of the case study, (b) data collection procedures, (c) the data collection questions, and (d) a guide for the case study report. Accordingly, I used a case study protocol to ensure the dependability of the study. Appendix G includes the case study protocol.

Marshall and Rossman (2011) and Stake (1995), described member checking as a quality control process in which researchers seek accuracy feedback from the recordings of what the participants stated during the interviews. I used member checking to enhance

the reliability and validity of the data collection process. Harper and Cole (2012) suggested member checking as an "important quality control process" (p. 510). López-Gamero, Claver-Cortés, and Molina-Azorín (2009) employed member checking during a study of business sector perceptions by providing study participants with copies of draft study findings and asking them to assess and comment on the credibility of the results. After transcribing the recorded interview answers, participants validated the interpretation of responses to the interview questions for accuracy.

Data Collection Technique

I collected study data from the review of documents as well as information obtained at neutral offsite locations of the participant's choice, through audio-recorded, semistructured, open-ended interviews. Patton (2002) supported open-ended questions for the collection of rich data. Yilmaz (2013) agreed that the use of open-ended questions ensures that the participants' responses provide insights into the research questions. Open-ended questions are exploratory and allow participants to share experiences through rich discussion.

Marshall and Rossman (2011) noted that semistructured interviews are helpful to use in creating an environment of active participation with the use of probing questions. Rubin and Rubin (2012) also agreed about the benefit of using semistructured interviews, and noted that it facilitated researchers toward subjects that apply to the study research question. However, Rabionet (2011) discussed a disadvantage of semistructured interviews including the need for the investigator to foster skills of careful listening and observation. While there are advantages to semistructured interviews, there are also

disadvantages. I used semistructured interviews and listened attentively to participants' responses, to explore and describe strategies that providers used to overcome barriers to transition to the ICD-10-CM coding system.

I conducted interviews at neutral offsite locations of each participant's choice and asked the participant's permission to record the interview before the actual interview started. Following each interview, I immediately transcribed the recorded interview responses. Thomas and Magilvy (2011) recommended having participants review copies of draft findings as part of member checking to validate the correct meaning from the data recorded. As suggested, before loading transcripts into NVivo 10.0 software, to ensure data collection process consistency, participants member checked a succinct synthesis (one-paragraph). NVivo 10.0 data analysis to organize the transcribed data into themes occurred after each member confirmed the data accuracy.

Data Organization Technique

To protect participant confidentiality in the study, I adhered the data organization to data retention and storage requirements required for Walden University doctoral research. A folder named *DBA Raw Data* contained each participant's raw data file, and the data folder is on a password-protected computer. I used a flash drive to store all the research information in case something happened to the computer. The flash drive is secured and locked in a cabinet along with interviews, notes, and consent forms. The raw data in each file consists of the participants number (e.g., P1, P2), consent form, e-mail record, document file name on the computer, completed interview protocol research checklist, completed interview question guide, transcription review completion, interview

location, and date and time of the meeting. Also, Yin (2014) suggested notetaking during the conduct of case study research. Following Yin's advice, I took notes during the interviews and referenced them during the data analysis process. Notes taken during the interviews are also on a password-protected computer, in a file named *DBA Interview Notes.*

High priorities for the study included securing data to protect participants' confidentiality. I typed all interview responses into a Word document to enter into NVivo 10.0 to capture and organize themes from the interview data (Bernard, 2013). The NVivo 10.0 files, named *NVivo Themes*, will be stored on a password-protected computer and deleted in 5 years from completion of the study. Raw data will be stored in a locked cabinet drawer for 5 years, at which time data destruction will occur. As such, data organization and detailed data security protocols ensured participant confidentiality.

Data Analysis Technique

Onwuegbuzie et al. (2012) suggested that data analysis involves a thorough review of data elements to organize, interpret, and discover underlying meaning. Following Onwuegbuzie et al.'s advice, I collected research data using semistructured interview questions (see Appendix F) to facilitate exploration of the primary research question undergirding this qualitative, single-case study: What implementation strategies can providers use to overcome barriers to transition to the ICD-10-CM coding system? The TAM framework was my lens to analyze the interview and document data.

Yin (2014) suggested case study researchers use triangulation via the collection of information from multiple sources to substantiate the same phenomenon and ensure

overall study validity. The four types of triangulation for case studies include data, investigator, theory, and methodological (Yin, 2014). I used the data triangulation technique for this qualitative, single-case study. The use of more than one strategy for gathering data assures the study credibility through data triangulation (Marshall & Rossman, 2011). Yin described that case study researcher's use of data triangulation to verify patterns in information from at least three different sources of data to ensure overall study quality. Yin further noted the strength of case studies exists in the use of multiple sources of data to validate the same phenomenon and support conclusions. Accordingly, I collected data from a review of documents as well as through observations of coding activities, and conducted interviews using open-ended semistructured questions as suggested by Yin.

At the end of each interview, I uploaded the audio recordings into the computer-assisted qualitative data analysis software (CAQDAS) tool, NVivo 10.0. I listened and transcribed the audio recordings to type participant responses and group data to generate themes based on information in the literature review. The data indicated the key implementation strategies used to overcome barriers to transition to the ICD-10-CM coding system. Similar to Qu and Dumay (2011), I sent the themes and excerpts to the participants for member checking. Marshall and Rossman (2011) and Stake (1995) described member checking as a quality control process in which researchers seek accuracy feedback from the recordings of what the participants stated during the interviews. Morse and Richards (2002) recommended the use of an audit trail to monitor decisions and milestone events. Following the advice of Morse and Richards, I used an

audit trail to list all research decisions that related to major topics, including collection and analysis of data.

I conducted NVivo 10.0 data analysis, after each participant confirmed the data accuracy, to organize the transcribed and archival data into themes. I checked whether the outcome of the analysis was consistent with the interview questions underlying the TAM theory, including results from the healthcare studies discussed in the literature review. Yin (2014) identified five stages of data analysis (a) collecting the data, (b) separating the data into groupings, (c) regrouping the data into themes, (d) assessing the information, and (e) developing conclusions. Lastly, I formed conclusions based on my interpretation of the data.

Reliability and Validity

Reliability

Qualitative researchers address the trustworthiness of their research through dependability, as noted by Denzin and Lincoln (2011) and Marshall and Rossman (2011). Yin (2014) explained that qualitative researchers could use case study protocols and case study databases to demonstrate dependability. Ihantola and Kihn (2011) suggested that a researcher could achieve reliability by consistent use of research measurements. Ali and Yusof (2011) further noted that reliability procedures include asking the participants the same questions, then member checking and cross checking.

As noted by Wood, Gilbreath, Rutherford, and O'Boyle (2014), dependability is a concept that addresses the reliability and consistency of a study. Dependability ensures the integrity of collected data and findings (Marshall & Rossman, 2011). Following the

guidance of Wood et al., and Marshall and Rossman, I used the same semistructured, open-ended interview questions for all participants, and asked the interview questions in the same sequence. Furthermore, I adhered to the case study protocol provided in Appendix G that included (a) an overview of the intended project; (b) a description of the protocol purpose and intended use; (c) a description of study data collection procedures; (d) an outline of the case study report content; (e) a list of the case study interview questions; (f) a summary of the data analysis techniques and tools to be used; and (g) a description of the study dependability, credibility, and transferability methods. Also, through member checking, the participants validated the interpretations from the responses to ensure reliability.

Validity

Qualitative researchers ensure the integrity of their research by implementing measures for credibility and transferability (Denzin & Lincoln, 2011; Marshall & Rossman, 2011). According to Thomas and Magilvy (2011), qualitative researchers use three standards for testing validity: credibility, transferability, and confirmability. Lincoln and Guba (1985) further noted strategies to ensure validity: triangulation, member checking, addressing researcher bias, presenting discrepant or negative information, peer debriefing, and using an external reviewer. Trochim and Donnelly (2007) agreed that the four criteria to assess qualitative research are (a) credibility, (b) transferability, (c) dependability, and (d) confirmability, but urged researchers to use rich thick descriptions to validate research. Accordingly, I used these strategies and measurements to ensure the integrity of this case study.

Creditablity. To ensure credibility, researchers describe the phenomena from the participants' perspectives. To achieve credibility, a data triangulation technique was used for this qualitative, single-case study, as noted by Yin (2014). I collected study data from the review of documents and information from semistructured interviews and used the data gathered to triangulate findings to ensure credibility. Through member checking, participants verified the interpretation of responses to the interview questions to enhance the credibility of the qualitative study (Thomas & Magilvy, 2011).

Transferability. Transferability refers to how the research result applies to other similar entities and if the results can assist other organizations with a similar challenge (Foster & Urquhart, 2012; Marshall & Rossman, 2011). To achieve transferability, I provided a rich description of the study findings to allow comparison of similarities between different research sites (Marshall & Rossman, 2011). Also, providing rich details enables the readers to decide if the results are transferable to their organizations (Thomas & Magilvy, 2011). Specifically, readers will receive the information necessary to assess the transferability of findings and conclusions of implementation strategies to overcome barriers to transition to the ICD-10-CM coding system.

Confirmability. To address the confirmability of this study, I used audit trails as noted by Houghton, Casey, Shaw, and Murphy (2013). The audit trail included outlining the decisions made to provide a rationale for my methodological and interpretative judgments (Houghton et al., 2013). Yilmaz (2013) explained that confirmability occurs when the researcher confirms findings. I used the interview recording to assist with

checking and rechecking the data interpretation for accuracy. Table 4 shows a summary of the analysis of qualitative trustworthiness for this study processes and protocols.

Table 4

Trustworthiness Protocols

Researcher activity	Study protocols	Trustworthiness contribution
Archive data	Retention of raw data is planned for 5 years, in compliance with Walden University requirements	Credibility
Observational journal	Researchers notes during interviews, follow-up impressions after interviews, document all decisions, and major milestones	Credibility/ transferability/ dependability/ conformability
Audit trial	Process documentation, retention of all analysis and synthesis process steps, record why and when of all interview guide changes, all decisions, and research milestones	Dependability/ conformability
Data source triangulation	Use of multiple participants from different temporal and spatial environments	Transferability
Thick layered description	Provide detail necessary to other researchers to apply protocols elsewhere in similar locations	Transferability
Slow open process	Suspending judgment about the observed phenomenon, exercising self-awareness, and set aside reference frame to address bias and potential for misinterpretation	Credibility
Iterative, scientific, and consistent process	Following an iterative and scientific process, NVivo content analysis will support coding consistency in the systematic inductive approach selected for data analysis	Credibility
Data collection protocol and instrument	Interview protocol followed, interview guide includes questions that enable answers with appropriate depth and precision	Credibility
Data saturation	Census sample with a sample size large enough to assure data saturation and negative cases	Credibility
Member checking	For accuracy verification, participants will verify codes, and synthesis results	Credibility

Note. From *The Positive Deviance Phenomenon of Leading Successful Strategic Change* (Doctoral dissertation, p. 155) by G. Johnson Morris, 2014, ProQuest Dissertations and Theses Database. Reprinted with permission (see Appendix I).

Transition and Summary

In Section 2, I stated the purpose statement of my research study, addressed the role of the researcher, discussed the selected participants, and detailed the research methodology and design. Next, I described the (a) population and sampling method; (b) ethical research; (c) data collection instruments, technique, and organization; and (d) data analysis techniques. Section 2 concluded with a discussion of the methods and techniques for assuring the reliability and validity of this study.

Section 3 begins with an introduction, including the purpose statement and the research question followed by the presentation of findings. Section 3 also includes the following topics: (a) application to professional practice, (b) implications for social change, (c) recommendations for action, (d) recommendations for further research, (e) researcher reflections, and (f) a conclusion.

Section 3: Application to Professional Practice and Implications for Change

The purpose of this qualitative, single-case study was to explore strategies used by healthcare providers to overcome barriers to transition to the ICD-10-CM coding system. The participants in this study included a health information manager, four coders, and four clinicians from a public health organization in South Florida. The primary data collection methods for the study involved face-to-face interviews with participants, document review, and observations. In Section 3, I will (a) present findings of the study, (b) discuss the application of the study to professional practice, (c) discuss the implications of social change and action, (d) suggest further research, and (e) offer reflections, including notes on the data collection of the study.

Overview of Study

I conducted a qualitative single case study to explore strategies used to overcome barriers to transition to the ICD-10-CM coding system. The central research question for this study was the following: What implementation strategies can providers use to overcome barriers to transition to the ICD-10-CM coding system? I collected study data from the review of documents as well as observations and the information received from nine semistructured interviews. Company documents, observations, and interviews provided methodological triangulation of the data. Census sampling supported the identification and recruitment of study participants. All nine interviews were conducted face-to-face at locations of the participants choosing. A census sampling approach resulted in nine participants to secure the inclusion of staff known to have different access and experiences with the ICD-10 transition. I audio recorded, transcribed, and

analyzed the interviews in NVivo 10.0 and compared the literature review with the emergent themes from the data to determine strategies used to overcome barriers to transition to the ICD-10-CM coding system. I identified four emergent themes from the participants' interviews: (a) in-depth ICD-10 training, (b) the prevalence of ICD-10 cheat sheets, (c) lack of system readiness, and (d) perception of the usefulness of job performance.

Presentation of the Findings

The central research question used to guide the study was as follows: What implementation strategies can providers use to overcome barriers to transition to the ICD-10-CM coding system? I used NVivo 10.0 to code all case study information and to conduct code frequency for identifying key themes. Three themes emerged from the analysis of participant responses the interview questions, and one theme emerged from the examination of the relationship between the study conceptual framework and participants' perceptions of the usefulness of the ICD-10-CM system for job performance.

The TAM framework served as the conceptual basis for the qualitative, single-case study for what implementation strategies providers used to overcome barriers to transition to the ICD-10-CM coding system. The TAM framework includes two premises: people want to use a system that will benefit their job performance, or PU, and people wish to use a system that does not require much effort, that is, PEOU (Davis, 1989). I examined all interview transcripts and company policy and procedure documents

to determine the presence of the PU premise of the conceptual framework. The focus of this study was the PU of the system.

Theme 1: In-Depth ICD-10-CM Training

All of the participants in the study (Participants 1–9) acknowledged that training was an important step for preparing for the ICD-10-CM transition. As noted by participant 1, "everyone had to go through mandatory ICD-10 training." Participant 2 described the training as "knowing that there was training . . . that helped me prepare mentally for the transition"; and participant 4 noted, "it was just beautiful, excellent, especially the last one, on documentation."

The participants' responses regarding the ICD-10 training as an essential step to the transition aligns with suggestions of Rahmathulla et al. (2014) and Meyer (2011) on the requirement for staff training. Similar to the comments made by participant 2 on training reducing anxiety, Rubenstein (2014) referenced ICD-10 training as a strategy to minimize the "fear of change" (p. 6) to the new system. Furthermore, as concluded by Jackson and Muckerman (2012), the participants in this study also agreed that ICD-10 training was the most significant component of the transition.

The ICD-10 training for this public health organization also included training the clinicians on documentation. Participant 1 described the objective of the clinicians' training as "training the providers on documentation and the new requirements for documentation." Participant 1 further described the transition to ICD-10 as "documentation is being driven by this . . . this is where the drive is, and that's the key to it." Participant 2 responded to the increased demand for documentation for ICD-10-CM

as “yeah, without a doubt.” Participant 6 mentioned, “It’s more intricate, more specific, advanced in the way that the descriptions are detailed.” Participant 4 further noted that to code accurately in ICD-10, “you have to have the documentation for ICD-10.”

Participant perceptions and document content regarding the specificity of clinical documentation for the ICD-10 transition are consistent with references in the literature. In a study conducted by Jackson and Muckerman (2012), the participants expressed the importance of physician involvement, mainly for documentation accuracy and granularity. Watzlaf et al. (2015) further asserted the increased specificity in the ICD-10-CM code would demand higher levels of documentation. Like Jackson and Muckerman, and Watzlaf et al., Henley (2013) explained the need for specificity in clinician documentation and the importance of the clinical elements required for the ICD-10 system. Talebian (2014) described the precise nature in the new system would clearly identify patients’ medical severity to justify procedures performed.

In characterizing how organizations can best prepare for the ICD-10 transition and future revisions (i.e., ICD-11), two-thirds of the participants described training as a best practice. Participant 1 described,

> Hindsight. If we had the opportunity to go back and see the seriousness of where the hiccups would have been and what the impact of training, or the lack thereof and probably the timing when training should be done…

Participant 2 suggested,

> I would say hire the appropriate number of trainers and allow the appropriate amount of training time. Make sure that the providers and the coders are not distracted . . . . Retrain as necessary.

Participant 5 supported the suggestions of the other participants and recommended that organizations can best prepare by "extensive training."

References in the literature support participants' perceptions that training for the ICD-10 transition might lead to the best approach for preparation. Bloomrosen et al. (2014) noted that training and education should be a primary area of focus to minimize coding disruptions. Harris and Zeng (2012) further explained that ICD-10 training is essential for the ICD-10 transition and emphasized that training will help reduce anxiety for providers. Houser et al. (2013) also described ICD-10 training as a critical approach for successful implementation of the new system.

Theme 2: The Prevalence of ICD-10 Cheat Sheets

Study participants alluded to the use of cheat sheets as a strategy to overcome barriers to transition to the ICD-10-CM coding system. Providers use the terms *cheat sheets* and *superbills* synonymously. Both Lindsey (2013) and McNicholas (2013) recommended that providers prepare for changes in clinical documentation with new superbill forms. Accordingly, this public health organization created and provided cheat sheets for their coders and clinicians as a tool to facilitate the transition to ICD-10-CM. As a result, Participant 2 noted, "The way I decreased my anxiety is knowing that . . . was going to and has created cheat sheets of the most common codes." Participant 1 similarly expressed that "cheat sheets were the key points, and the cheat sheets were the biggest

anxiety reliever to get the provider to relax." Participant 2 said, "Cheat sheets . . . It provides a list of what we use most often . . . we find that works very well." Another participant described the cheat sheets as "very helpful . . . the cheat sheets, the book is extremely big…I refer to it a lot, but I refer to my cheat sheets also" (participant 5). Participant 4 also noted that "oh the cheat sheets, they are a big help."

Participants' perceptions and document content regarding cheat sheets as a practical strategy for the ICD-10-CM transition are inconsistent with the references in the literature. Beckman (2012) suggested that a one or two-page superbill would not be adequate for the preparation of the ICD-10-CM. Rubenstein (2014) agreed with Beckman and described the use of superbills for the transition to ICD-10 as "unreliable at best" (p. 2). Watzlaf et al. (2015) cited a survey that revealed 60% of physicians believed it would be difficult to include the commonly used diagnosis codes on a superbill.

Averill and Butler (2013) noted that providers would only use a subset of ICD-10-CM codes that are relevant to their specialty. Therefore, this public health organization created eight cheat sheets by service line (specialty). Participant 1 mentioned, "It [the cheat sheets] has most frequently used ICD-10 codes . . . eight different types of superbills"; and participant 2 said that the cheat sheets answered, "what are the most common codes that you use in the program." Participant 5 further described, "We have infectious disease, STDs, female, and male . . . I have obesity, and it gives me the obesity codes and the BMIs . . . it's basically by specialty." As supported by the literature and by this public health organization strategy to provide cheat sheets by specialty, providers will continue to use a limited number of codes within their specialty; no physician will

ever use all 70,000 diagnosis codes as disputed by Bowman (2014) and Averill and Butler.

Theme 3: Lack of System Readiness

A dominant theme to emerge from the analysis of participant responses and the review of documents was the lack of system readiness. All of the participants (Participants 1–9) indicated that the lack of preparation for the EHR system was a significant barrier to the ICD-10-CM transition. The EHR system that the organization is using is supported internally, while a vendor (external) supports the system that is used for laboratory orders. Participant 2 described the two systems in this way: "They don't talk to each other . . . one of them has the codes pre-populated . . . one of them converts it." Participant 1 mentioned, "The people that were in charge did not implement or test early enough to get the kinks out of the system." Participant 2 explained, "I get frustrated sometimes when one system is converted and one system isn't …that's a bit of a barrier." Participant 3 further noted, "Our system is not ICD-10 capable . . . . our system still only has ICD-9 codes.

Due to the lack of system readiness, management instructed the providers to continue to select ICD-9 codes in the EHR system. One of the clinician participants, participant 7, who has been selecting the ICD-10 code rather than the ICD-9 code as directed by management, expressed the reason as, "ICD-10 is a mandate . . . I like to progress." Participant 5 mentioned that the directives given by management are "holding us stagnant because we want to go ahead with the ICD-10, but they're forcing us to stick with the ICD-9." Participant 4 noted, "If our system was ready, ICD-10 would be a piece

of cake . . . I was so looking forward to this new thing." The policy and procedure also require coders to review the provider documentation and identify the most appropriate ICD-10 code for billing. Participant 4 described this process as follows:

> Doctors have been given the okay to continue with ICD-9 codes with the exception of the three who have decided against that. You, as a coder, have to go back and map from the ICD-9 code to an ICD-10 code, but sometimes that is challenging because the code that they are providing does not match with the provider's documentation.

The participants also revealed that the system would be compliant for ICD-10 in March of 2016. Participant 7 observed that given the readiness date of the system "providers will have to be retrained."

Participants' concerns about the impact of the lack of system readiness for the ICD-10-CM conversion are consistent with themes in the literature. For the preparation of the conversion, Rubenstein (2014) recommended that providers determine whether their EHR system would require updating. Rahmathulla et al. (2014) further discussed software needed to be timely with updates to allow for systems testing and readiness. According to Watzlaf et al. (2015), their study participants noted EHR functionality, timeliness, and readiness were the top priorities for a successful transition to ICD-10.

Theme 4: Perception of the Usefulness of Job Performance

The positive evaluations offered by most of the study participants (Participants 1–8) indicate that the use of the ICD-10-CM system will benefit their job performance. Participant 5 reported,

> When I am reading the charts, it let me connect with my patients . . . because we do have sick patients and when you read a new chart you would be like, "this patient is so sick," but you can see their progress. That's one of the things that I'm excited about with the new system.

Participant 2 noted,

> If I am passing on care to my colleague, all they have to do is look at this. Their going see the code that I picked. It's not so much non-specific. It tells them clearer what is going on . . . A lot more specific.

Participant 1 indicated,

> Understanding in terms of procedures that are done and diagnoses that support those procedures, the medical necessity of it and it helps us to all understand that we are providing good quality patient care . . . . on the return visit, everything is documented accurately.

While Participant 6 expressed the benefits of the new system for clinical care, the participant also noted that the system was complex: "I would use one code in ICD-9 for my pregnant patients, now I have to choose three codes in ICD-10." Comments made about the complexity of the ICD-10 coding system aligns with the literature. Manchikanti et al. (2014) described the similarity of the ninth and 10th revisions of ICD, but also noted that the new system is more complex with many changes.

Pai and Huang (2011) asserted that users would demonstrate positive attitudes about a new system if users perceived it as appropriate for their job performance. Davis (1993) declared PU as more important than PEOU. While most of the participants did not

provide insight on the PEOU of the new system, the positive evaluations offered by most of the study participants indicate that usefulness of the new system attributed to the transition. These findings align with Davis's (1985, 1993,1989) position that PU increased acceptance of new systems, similar to the study results of Lee et al. (2011), BenMessaoud et al. (2011), and Song et al. (2015).

Applications to Professional Practice

The purpose of this qualitative, single-case study was to explore strategies that providers in the southern region of the state of Florida used to overcome barriers to transition to the ICD-10-CM coding system. Participant explanations, company documents, and literature review findings provided a consistent depiction of the magnitude of preparedness, consequences, and underlying contributors for the transition to the ICD-10 system. Participant perceptions regarding strategies that facilitated the implementation, including the impact of the lack of EHR readiness for the ICD-10 system, reinforce assertions in the literature that the transition to the new system requires significant attention, assessment, and action from healthcare providers as supported by Rubenstein et al. (2014b).

According to the participant responses in this qualitative, single-case study, the results indicate best practices that may influence other organizations to replicate strategy readiness, acceptance, and usefulness of the ICD-10 system and for future ICD system transitions. These outcomes are also important for providers to examine the strategies used to mitigate operational, technological, clinical, and financial disruptions for future healthcare legislative changes. For over three decades, the ICD-9 system has been used

in our healthcare industry and embedded in many functional processes throughout the industry. Proper assessment of the new coding system, combined with effective planning, is necessary for a successful transition. Study findings suggest the need for providers to conduct better assessment and test technology in a timely matter, mitigate adverse impacts, and manage operations beyond 2015 to ensure that remediation activities can be maintained over time as mentioned by Boyd et al. (2013).

Participants also expressed the opinion of the need for upper management to get buy-in to ensure system, operation, and clinical readiness. As Participant 5 suggested,

> Have all your personnel willing . . . to learn . . . . If someone is pulling back, it's not going to go well, and that's why we're having such a hard time because everybody is not on board.

Participant 2 recommended a pilot training program before the actual launch of training as a strategy to get buy-in from personnel that are not receptive: "have a group of volunteers that are receptive or embracing it to see if that training is good . . . get some feedback so that . . . the ones that are resistant will be less resistant." The recommendation for buy-in aligns with the suggestions from Jackson and Muckerman (2012) and Houser et al. (2013), who identified the benefits of buy-in, but also noted the need for involvement of administrative staff to support the transition to ICD-10.

Study findings also highlight the need for better training delivery. Study participants observed that the ICD-10 system was too intense to learn and retain in an 8-hour session. Participant 2 noted, "my only complaint is that it should have been longer because they tried to cram 2 days in 1 day." Participant 2 further suggested, "if you're

going to go ahead and do the training you might as well allot the appropriate amount of time, otherwise you're wasting your time." Findings from this study reinforce the need for proactive approaches to delivering training in phases. Literature supports the recommendation for coding staff to spend 16 hours of training and for providers at least 12 hours as noted by Gonzalez and Chiodo (2015).

Implications for Social Change

Berwick and Hackbarth (2012) pointed out that the U.S. healthcare spending reached just under 18% of the GDP in 2011 and predicted to reach 20% of GDP by the year 2020. With healthcare expenditures to approach 20% of the GDP, our government continues to address ways that fraud, waste, and overspending can be controlled in our healthcare system while still providing quality healthcare. The ICD-9 system depicted limited information about patients' medical conditions and severity in comparison to the ICD-10 system (Dexheimer et al., 2015). Given the precision of the new coding system, Topaz et al. (2013) acknowledged that fraud and waste would be better captured, thus eliminating unnecessary healthcare spending.

Study findings support the benefits of the ICD-10 system to reduce waste as it illustrates a clearer picture of the severity of patients' illness. Rahmathulla et al. (2014) similarly suggested that the transition to ICD-10 will increase fraud detection while enabling significant long-term savings and benefits in healthcare spending. Medical insurance programs, such as Medicare and Medicaid as well as private insurance companies, reimburse healthcare claims according to the clinical codes submitted by providers. Topaz et al. (2013) explained the new system would decrease medical fraud

and abuse by reducing the ability for providers to report repeatedly the same procedure on the same side of the body. While the transition to the new system will provide greater clinical information to track patient outcomes (Sanders et al., 2012), the findings of this current study may also offer strategies for providers to implement a system that may benefit society through healthcare spending savings.

Recommendations for Action

I examined study participant responses and case study documents and identified multiple themes about strategies believed to be necessary for providers to overcome barriers to transition to the ICD-10-CM coding system. The analysis of themes 1-4 supports the identification of recommended actions that U.S. healthcare providers may consider for transitioning to the ICD-10 system to minimize possible operations as well as technological, clinical, and financial disruptions. The transition to ICD-10 enables the collection of more relevant and precise data of the severity of illness of patients (Gonzalez & Chiodo, 2015), the monitoring of patient outcomes of treatment, and the improvement of the capacity to manage population health (Gevirtz, 2013). The effective transition to the ICD-10 system requires the efforts of providers and leaders. Recommendations resulting from this study might guide the actions of healthcare leaders working in all areas of change management.

First, providers should deliver training in a phased approach to transition to the ICD-10 coding system. As supported by the literature review, the new system is more complex than the older system and requires in-depth phases of training. Providers should allocate significant time for staff to learn the new coding system. Rather than relying on a

1-day training session, providers should seek opportunities to train and build awareness of the new coding system through many channels including bulletin boards, emails, meetings, and other outlets. As recommended by the participants, clinical documentation evaluations should be conducted to identify documentation deficiencies and provide training on the required specificity. Providers working to deploy the ICD-10 system should ensure that staff use the ICD-10 coding system in parallel with the ICD-9 system before the go-live date as recommended by Gonzalez and Chiodo (2015).

Second, providers should establish implementation standards for the transition to the ICD-10 system. Providers should dedicate and collaborate with internal resources for IT systems testing and readiness to support the ICD-10 transition efforts. Providers should develop an ICD-10 testing plan to define a testing scope to mitigate the transition risk to the organization. To assure that appropriate testing occurs before go-live, providers should coordinate testing timelines and plans with both internal and external trading partners including time to incorporate changes into all impacted systems. As noted by Rubenstien (2014), advanced determination on whether the system will require updates and if the system meets the demands of ICD-10-CM will minimize technology disruptions and workarounds.

A final recommendation centers on the need for providers and leaders to promote the ICD-10 transition through awareness and buy-in. Providers and leaders should work together to ensure that all staff are aware of the benefits of the new system. The risk of lack of preparation associated with not getting key personnel buy-in should be identified. Providers should consider appointing a team that will champion the transition as

suggested by Rubenstein et al. (2014b). The team should include a member from the HIM, billing, IT, and clinical departments. Champions should assist with raising awareness while inspiring and engaging peers within the organization. A physician champion, for example, should lead the organization in understanding the importance of documentation to support the ICD-10 system.

Buy-in can also be achieved through the use and adoption of the conceptual framework, TAM, in which was used in this study. The TAM theory suggests validating the benefits and ease of use and usefulness of new technology to remove user resistance (Davis et al., 1989). Providers and leaders should focus on using the PU construct to assist champions to demonstrate the benefits of the use of the new system to minimize resistance. The more end users view of the new system, the greater the acceptance (buy-in). The recommendation of the application of the TAM theory to promote acceptance is consistent with other cases in the literature. Holden and Karsh (2010) suggested that organizations pinpoint "factors that shape users' intentions" (p. 160) to promote acceptance. Pai and Huang (2011) found that users demonstrated positive attitudes about the new technology if they believed it would enhance their job performance. Additionally, the premise of the TAM framework that PU positively influences the acceptance of a new system was evident in the observation of several current study participants.

Study findings and recommendations are of direct significance to the efforts of reforming the industry in the area of higher quality clinical information for measuring healthcare outcomes. The use of a variety of outlets for the dissemination of findings will

maximize the opportunity for providers and healthcare leaders to gain access to the information resulting from this study. Publication of this study in the ProQuest/UMI database will provide access to students and researchers. Furthermore, study participants will receive a one-to-two page summary of study findings and recommendations. I will also prepare an article based on the study results for publication in a peer-reviewed journal and pursue opportunities to present study findings at professional conferences.

Recommendations for Further Research

I used a census sample of participants in a public health organization in the state of Florida and used policy and procedures documents as the basis for the study of strategies used by providers to overcome barriers to transition to the ICD-10-CM coding system. The analysis of the data gathered from semistructured interviews with participants and the review of documents enabled me to identify strategies that might prove useful for transitioning to the ICD-10 system. The conduct of further research that expands beyond the geographical and sample population boundaries of this study might lead to additional clarity and insight regarding strategies necessary for overcoming barriers including change management strategies.

One recommendation for further research includes the exploration of provider responses to strategies used to overcome barriers to transition to the ICD-10-CM coding system in other states or other regions of the state of Florida. Researchers could employ a qualitative approach similar to that used for this study to explore how a broad spectrum of providers across the United States describe strategies used to overcome transition barriers to the ICD-10 system. Alternatively, researchers could use findings from this

study to develop a survey that serves as the basis for a quantitative assessment of providers across the nation that characterizes responses to the ICD-10 transition barriers.

A second recommendation for future study centers on the need for exploration of the post ICD-10 financial impact on coder productivity and mitigation strategies used. Prior researchers have recommended ICD-10 training as a key strategy to mitigate the loss of coder productivity (Harris & Zeng, 2012). Other countries that have transitioned to the ICD-10 system reported productivity loss in the initial stages of go-live. Canada, for example, experienced a 50% coding productivity loss for over a year post go-live (Johnson, 2004). Examining the root causes of productivity loss and the operational and financial impact on the organization could be of value to the industry. Researchers wanting to identify appropriate strategies for the mitigation of coder productivity should conduct additional studies.

Finally, understanding of clinician perceptions of the documentation requirements for the ICD-10 system post go-live requires that researchers do further studies. References in the literature reveal opposing clinician attitudes on the documentation requirements for ICD-10. Watzlaf et al. (2015) conducted a study that showed some physicians perceived the ICD-10 clinical documentation requirement as burdensome while others believed that the new system would not influence their documentation patterns as their current documentation contained the details needed for the new system. I conducted this study within a week of ICD-10 go-live. At the time, the clinician participants did not express perceptions on the documentation requirements. As noted by other study participants, clinician documentation was not precise enough for ICD-10 code

selection. Exploration of the clinician perception of documentation requirements and the use of workarounds, including cheat sheets, might enable the identification of strategies for detailed documentation while also minimizing operational, clinical, and financial disruption.

Reflections

My goal in conducting the single-case study was to build on my experience as a researcher while exploring a topic with national and legislative implications. Engagement with study participants in an open-ended manner enabled investigation of strategies used to overcome barriers to transition to the ICD-10-CM coding system. I remained sensible of my identified personal biases throughout the conduct of the study and remained focused on collecting, analyzing, and interpreting the data, and results gathered from participant interviews and document reviews without prejudice.

Before commencing data collection for the study, I identified personal biases that ICD-10-CM codes are more comprehensive than ICD-9-CM codes, change is hard, and individuals will resist change. All study participants acknowledged the ICD-10 system as more specific than ICD-9 and majority of the participants expressed the opinion of excitement and usefulness of the new system. My assessment of the participants' observations required re-evaluation of my belief that individuals will resist change. Conduct of the study resulted in my better awareness, as supported by Davis (1993), that if users believe the new system will enhance their job, they will be receptive to change. Participant observations and attitudes regarding the acceptance of the ICD-10 system are consistent with studies in the literature. BenMessaoud et al. (2011) reported that PU was

a major facilitator for surgeons who used robotic-assisted surgical technology. Lee et al. (2011) described similar results of the implementation of a computer-aided DSS in a hospital.

However, in an attempt to recruit participants for this study, it was evident that there was a lack of preparation and urgency for some provider organizations to implement ICD-10. In the early weeks of September, I contacted approximately 12 managers of healthcare organizations to participate in the study. Most of these managers expressed that preparation for the mandated change was in process, coding and clinician training had not yet been attended or delivered, that they hoped the implementation date would be delayed (as in the past), and some responses to the qualification question did not meet the inclusion criteria for the study. While the implications of the lack of readiness, as supported by the literature, revealed clinical, administrative, and financial disruptions (Fleming et al., 2015; Henley, 2013; Manchikanti et al., 2014). Leaders in healthcare organizations did not make the necessary steps for preparation. While this study did not include a focus on why some providers lagged in preparation efforts, the fact that this mandate was unfunded, and the implementation has twice been postponed may be of cause for concern and requires further investigation.

Previous studies of the transition to the ICD-10 system have centered on the clinical documentation requirement, increased number of codes, and the effect on operations (DeAlmeida et al., 2014; Manchikanti et. al., 2011; Moczygemba & Fenton, 2012; Watzlaf et al., 2015). Conduct of the qualitative case study enabled direct engagement with participants with different access and experiences with the ICD-10

system and supported the examination of strategies used to overcome barriers, including the assessing the PU predictor of the TAM conceptual framework. Study participants provided candid and honest responses to the interview questions. Additionally, observations offered by the participants validated content in the literature describing the barriers and consequences of lack of preparation, and the impact of acceptance of new systems based on the TAM conceptual framework. Based on the analysis of participant responses and document reviews, I was able to identify strategies for overcoming barriers to transition to the ICD-10-CM coding system.

Summary and Study Conclusions

The final rule published in the Federal Register to adopt the ICD-10 system was intended to improve the ability to track outbreaks, monitor patient outcomes of treatment, and improve the capacity to manage population health (Gevirtz, 2013) while aligning the United States healthcare industry with a coding system used worldwide. To realize those benefits, some providers need implementation strategies for overcoming barriers to transition to the ICD-10-CM coding system. The conduct of this qualitative, single-case study supported the exploration of strategies used to overcome barriers to transition to the new coding system in the state of Florida. I used information gathered from a review of documents, observations, and information received from nine participants of a public healthcare organization to explore what strategies are used by providers with different access and experiences with the ICD-10 system transition. The use of a case study protocol supported the demonstration of study dependability. The use of multiple data sources, rival explanations assessment, researcher bias identification, and member

checking contributed to the credibility of study findings. Rich description of the study finding to allow comparison of similarities between different research sites supported the transferability of the study.

With the exception of the use of cheat sheets, study findings were consistent with results of the business literature review and reinforced that proper planning for the transition to ICD-10-CM is vital for providers to mitigate clinical, technological, operational, and financial disruptions. Additionally, study findings aligned with the conceptual framework, TAM, that PU increased acceptance of new a system (Davis, 1985, 1993). A key recommendation resulting from the study is the need for providers to deliver training in a phased approach to transition to the ICD-10 coding system. Another recommendation is the need for providers to dedicate and collaborate with internal resources for IT systems testing and readiness to support the ICD-10 transition efforts. An additional recommendation is for providers to appoint a team that will champion the transition to promote organization acceptance in key departments.

The transition to the ICD-10 system affects virtually all core business systems for providers. The collaboration efforts of providers and leaders to assess every process and system to use an ICD-CM code or description might enhance the degree of operational, technological, clinical, and financial success they will experience within their organization. Exploring how users come to accept and use new systems is an important aspect of change management that can relatively explain the success or failure of a new system. Adoption of the recommendations from this study might enable providers and healthcare leaders to mitigate disruptions, and document best practices while capturing

more accurate and consistent health information about the severity of patients' conditions using the new system.

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Appendix A: Permission to Use Figure 2

Illustrations of the TAM and Related Theories

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Appendix B: Permission to Use Figure 3

ICD-10-CM Code Character Description and ICD Version Comparison

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Date: Fri, May 8, 2015 at 2:39 PM
Subject: RE: [FWD: Permission to Reproduce Figure]
To: "judith.monestime@waldenu.edu"
Cc: Zachary Gillan

Hi Judy,

You can include a reference to doi:10.1093/jamia/ocu042 and reproduce Figure 1: "ICD-10-CM Code Character Description and ICD Version Comparison" for inclusion in your dissertation.

Please provide us with a link or PDF of a draft including the work and the final version of the dissertation when possible.

Thank you and good luck.

PHIL
--
F. Phil Cartagena, Jr., MBA, PMP, CPHIMS

Appendix C: Permission to Use Table 1

Coding Productivity Pre- and Post-ICD-10 Implementation

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Good Morning,

I would like to follow-up on the request below. The request was sent on 7/3/15 and I have not received a response.

Thanks,
Judy

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Date: Thu, Jul 16, 2015 at 5:18 PM
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Thanks,
Graham

Appendix E: Permission to Use Figure 6

Percentage of Patient Visits and Reimbursement Associated with the Coding Categories

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Appendix F: Interview Questions

Interview Questions

1. What were the major steps in preparing for the ICD-10-CM transition?
2. What barriers are you experiencing to convert to ICD-10-CM?
3. What implementation strategies are you using to overcome barriers to transition to the ICD-10-CM coding system?
4. What benefits of the ICD-10-CM system did you communicate to your personnel?
5. How will using the ICD-10-CM coding system enhance your job performance?
6. How can organizations best prepare for this transition?
7. What else could you share that is pertinent to your implementation strategies for ICD-10-CM?

Appendix G: Case Study Protocol

A. Case Study Introduction
   1. Research Question
      a. What implementation strategies can providers use to overcome barriers to transition to the ICD-10-CM coding system?
   2. Conceptual Framework
      a. Technology acceptance model (Davis, 1989)
B. Protocol Purpose and Intended Use
   1. Protocol to be used by the researcher to guide and inform all study data collection, analysis, and findings and conclusions preparation efforts
   2. Researcher will use the protocol to ensure dependability of case study methods, findings, and conclusions
C. Data Collection Procedures
   1. Data to be collected from the review of documents and the conduct of semistructured interviews with participants with different access and experiences with the implementation of the ICD-10-CM system
   2. Researcher will recruit participants from Florida healthcare providers.
   3. Specific study sites and contact persons at each site to be identified after letters are sent and responses received to finalize sites and participants
   4. Expected preparation activities to take place prior to site visits to conduct Interviews
      a. Collection and review of documents for each organization to be represented in study to assess organizational perspectives regarding implementation strategies for ICD-10-CM.
      b. Preparation of informed consent forms for each interviewee
      c. Review and finalization of planned interview questions
   5. Data collection tools
      a. Digital audio recordings
      b. Researcher field notes
D. Outline of Case Study Report Contents
   1. Overview of study
   2. Presentation of the findings
   3. Applications to professional practice
   4. Implications for social change
   5. Recommendations for action
   6. Recommendations for further study
   7. Reflections
   8. Summary and study conclusions
E. Case Study Interview Questions
   1. What were the major steps in preparing for the ICD-10-CM transition?
   2. What barriers are you experiencing to convert to ICD-10-CM?
   3. What implementation strategies are you using to overcome barriers to transition to ICD-10-CM?

4. What benefits of the ICD-10-CM system did you communicate to your personnel?
5. How will using the ICD-10-CM coding system enhance your job performance?
6. What else could you share that is pertinent to your implementation strategies for ICD-10 CM?

F. Data Analysis Techniques and Tools
   1. Coding
   2. Analysis tools
      a. NVivo
      b. Microsoft Excel

G. Study Dependability, Credibility, Transferability, and Confirmability Methods
   1. See Table 4

Appendix H: Permission to Use Table 3

Pediatric ICD-9-CM Codes of All Pediatric ICD-9-CM Codes in Illinois Medicaid

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Appendix I: Permission to Use Table 4

Trustworthiness Protocols

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From: Gail Johnson Morris

Date: Fri, Jun 5, 2015 at 10:27 AM

Subject: Re: Permission to Reproduce Table 5 Trustworthiness Protocols

To: Judy Monestime <judith.monestime@waldenu.edu>

Judy,

I am very pleased to hear that my compilation of trustworthiness protocols has proven helpful to your progress. By way of this email I grant permission to use the table in your doctoral study. I look forward to having a copy of your study when it is published! The table appears on p. 139 of my study, here is the UMI reference:

Johnson Morris, G. (2014). The positive deviance phenomenon of leading successful strategic change (Doctoral dissertation). Available from ProQuest Dissertations and Theses database. (UMI No. 3623421)

Dr. Gail

Appendix J: Letter of Cooperation

September 23, 2015

Dear Judith Monestime,

Based on my review of your research proposal, I give permission for you to conduct the study entitled ICD-10-CM Implementation Strategies within XXX. As part of this study, I authorize you to interview and member checking. The participation will be voluntary and at our own discretion.

We understand that our organization's responsibilities include conducting an over the phone or at a neutral offsite location of the participant's choice. We reserve the right to withdraw from the study at any time if our circumstances change.

I confirm that I am authorized to approve research in this setting and that this plan complies with the organization's policies.

I understand that the data collected will remain entirely confidential and may not be provided to anyone outside of the student's supervising faculty/staff without permission from the Walden University IRB.

Sincerely,

Signature on file

XXX XXX

Health Information Manager