



THE IMPORTANCE OF PROFESSIONAL VALUES FROM  
RADIOLOGIC TECHNOLOGISTS' PERSPECTIVE

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## ABSTRACT

Kelli Welch Haynes

The Importance of Professional Values from  
Radiologic Technologists' Perspective  
(Major Professor: Jessica Dolecheck, PhD.)

Research on professional values in radiologic technologists is practically nonexistent. Though learning professional values is important, professional values have not been identified and articulated by the radiologic technology profession. The purpose of this study was to determine radiologic technologists' perception of professional values and determine if radiologic technologists feel it is important to articulate professional values. No original research indicating the perception of professional values of practicing radiologic technologists was identified. The purposeful, convenience sample of 716 American Society of Radiologic Technologists (ASRT) members represented a cross sectional view of radiologic technologists. The Radiologic Technologists' Perceptions of Professional Values Scale (RTPPVS), adapted from the Professionalism in Physical Therapy Core Values Self-Assessment developed by the American Physical Therapy Association, was used to collect quantitative data regarding the importance of professional values from a radiologic technologists' perspective. Results indicated that professional values are important to radiologic technologists.

The RTPPVS revealed that radiologic technologists perceived the seven professional values, accountability, altruism, compassion/caring, excellence, integrity, professional duty, social responsibility as important. Overall, altruism indicators were chosen as the most important professional value and social responsibility was chosen as

the least important professional value. A sample of American Society of Radiologic Technologists members perceive it is important for the profession to explicitly articulate professional values.

The results from this research did not indicate a statistically significant difference among the demographic characteristics. There were no differences in perceived importance of professional values based on gender, age, state of residency, education level, years of experience, or job title. Implications for practice indicated a need for the profession to adopt and articulate professional values.

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## LIST OF ABBREVIATIONS

|         |   |
|---------|---|
| ARRT    | American Registry of Radiologic Technologists                   |
| ASRT    | American Society of Radiologic Technologists                    |
| CQR     | Continuing Qualification Requirements                           |
| JRCERT  | Joint Review Committee on Education in Radiologic Technology    |
| PPTCVSA | Professionalism in Physical Therapy Core Values Self-Assessment |
| RT      | Radiologic Technologist   |
| RTPPVS  | Radiologic Technologist Perception of Professional Values Scale |

## **CHAPTER 1 INTRODUCTION**

Professionalism has been defined as the behavior, purposes or traits that exemplify or differentiate a profession or a professional person and is a calling, demanding specialized knowledge, and rigorous academic preparation (Hultman, 2015). The roots of professionalism can be traced back to the fourth century with the creation of the Hippocratic Oath by the Greek physician Hippocrates (Nortje' & Hoffman, 2017). The oath defined healthcare as an ethical establishment which must be accomplished in agreement with a set of guidelines, explicitly delineating proper behavior displayed by healthcare workers in interactions with patients. Professionalism comprises a number of different elements and, together, these elements classify and define a professional. Hultman stated “Professionalism involves a 3-way contract between the provider, the patient, and society” (2015, p. 49).

Recently, professionalism, across health care professions, has been discussed extensively due to concerns over unethical, illegal, and unprofessional behavior and its negative consequences (Challen, Laaneliad, & Kukkes, 2016; Jha, Bekker, Duffy, & Roberts, 2006; Roberts, Dorsey, & Wold, 2014). Disruptive behavior, including incivility, has been associated with increased staff turnover, poor patient satisfaction, preventable adverse outcomes, medical errors, and higher costs of care (Rawson, Thompson, Sostre & Deitte 2013). Two substantial indirect costs of such behaviors are failure to create a culture of safety and failure to create functional teams in the health care

environment. In addition, unprofessional behaviors as substance abuse, theft, and sexual assaults against patients or other individuals impact care provided. As patients and practitioners alike are impacted when these situations occur, a strong argument to acknowledge, promote, and encourage professionalism is evident. Professionalism should be promoted and encouraged.

Professionalism is often discussed and is easy to recognize, but difficult to define; in fact, for some, the idea of professionalism has evolved into just a figure of speech (Challen et al., 2016; Nixon, 2001). Professionalism is defined by sets of attitudes and behaviors specific to professions (Hammer, 2000). For allied health professions, professionalism often includes professional values (Denton, Fike, Walk & Jackson, 2017). Consistent performance of defined professional values is a central tenet of professionalism. Professional values promote a framework that fosters excellence in clinical judgments in practice and a sense of professional commitment (Peer & Schlabach, 2009).

Professional values are formidable, engrained concepts that are adopted during professional education and influence future practitioners (Peer & Schlabach, 2009). The educational process for radiologic technologists (RTs), also known as radiographers, addresses value development and internalization on both personal and professional levels (Challen et al., 2016; Cox, & Killion, 2010). Radiologic technologists are required to incorporate professional values as standards in order to provide safe and high-quality ethical care (Brown, 2004, Nixon, 2001; Nortje' & Hoffman, 2017). Currently, the importance of professional values, from a radiologic technologists perspective, are

reflected only through “regulatory requirements and the moral imperative that being professional is the right thing to do” (Kelly, Mullan, & Gruppen, 2016, p. 531).

Many allied healthcare occupations have recognized the critical role professional values play in the development and execution of moral behaviors for practitioners identified and articulated professional values (Denton et al., 2017; Schlabach, 2017). According to Schlabach, “Shared professional values are the seeds of professionalism and are deeply rooted to intrinsically motivate ethical behavior” (2017, p. 13).

Professional values can be linked to equivalent values-based behaviors such as accountability, altruism, compassion/caring, excellence, integrity, professional duty, and social responsibility. The American Physical Therapy Association (2013) paralleled the professional value of integrity with sample indicators of values-based behaviors, such as trustworthiness, use of power judiciously, and confronting harassment. Nursing, physical therapy, and medicine have clearly expressed their own distinctive sets of shared professional values that communicate a sense of professional distinctiveness and identity (Peer & Schlabach, 2009). Nursing uses professional values to assist the nurse in making decision that coincide with the Code of Ethics for Nurses (Clark, 2009). The physical therapy profession adopted professional values to define expected values for its members (McGinnis, Guenther, & Wainwright, 2016). The American Board of Internal Medicine created and adopted professional values to “enhance the evaluation of professionalism as a component of clinical competence and to promote the integrity of internal medicine” (1995, p. 5). However, the profession of radiologic technology has not identified and explicitly articulated professional values and needs to do so in order to advance the profession.

Professionalism in the radiologic science professions is a relatively new concept and limited studies have been conducted on this topic (Nortje' and Hoffman, 2017). In comparison to established professions, such as medicine and therapy, radiologic technology is an occupation which is struggling to be recognized as such (Sim & Radloff, 2008). This struggle comes from the fact that prior to 2015, radiologic technologists were not required to have a college degree to practice in the profession (Cox & Killion, 2010).

The purpose of this study was to determine radiologic technologists' perception of professional values, to determine if radiologic technologists perceived it important to articulate professional values, and to determine differences in these perceptions based on demographic characteristics. No original research study indicating the perception of professional values of practicing radiologic technologists was identified during an intensive literature review.

Sim and Radloff classified two ways in which a vocation can be established as a profession: first, by following a set of attributes that characterize the profession; and second, by providing evidence of professionalization, namely that "an occupation is making efforts to achieve recognition as a profession" (2008, p. 204). The RT profession must identify and explicitly articulate shared professional values to continue to advance the profession.

Peer and Schlabach (2009) stated that professional values are specific to an exclusive professional identity, therefore, if the ASRT membership perceive the importance of articulating professional values, then the ASRT should promote professional values. The pronouncement of professional values for radiologic technologists will foster values-based behaviors and internally motivate a duty to uphold

the legal, ethical, and regulatory standards of the profession. This values clarification must be well-defined in order to assure appropriate education and opportunity for identification in students and to provide a guiding document for practitioners. Therefore, professional values for RTs must be identified and articulated so they can be applied in clinical practice and in the education of radiologic technologists.

The ASRT (2016) and American Registry of Radiologic Technologists (ARRT) (2016) developed practice standards and standards of ethics for the profession to educate the public and to serve as a guide for radiologic technologists' professional behavior. However, the progression of professional identity is not solely defined by practice standards and a code of ethics, but is mainly developed from the collective professional values of the group (Peer & Schlabach, 2009).

### **Guiding Theoretical Perspective**

To understand the perspective of professional values and the RT profession, Feldman's contingency model of organizational socialization provided the theoretical framework for this research (Feldman, 1976). According to Feldman, organizational socialization is "the process through which individuals are transformed from outsiders to participating, effective members of an organization" (1976, p. 15). Through education and guided clinical experiences, the prospective radiologic technologist is socialized into the role of a radiologic technologist. Students initially learn attitudes and behaviors of the profession through formal learning, experiences in the clinical setting through socialization by faculty, and practicing radiologic technologists (Clark, 2009). After graduation, professional socialization continues through interactions with practicing radiologic technologists. Students learn expected roles, attitudes, values, and behaviors of

radiologic technologists, a process reflective of Feldman's contingency model of organizational socialization.

Feldman theorized three stages in the socialization process: anticipatory socialization, accommodation, and role management. Organizational socialization involves the process by which an individual adapts to a specific role in an organization (Chao, O'Leary-Kelly, Wolf, Klein, & Gardner, 1994). According to theory, as new employees are assimilated into organizations their behavior will be modified in the direction of peer group behavior (Boyle, Popkess-Vawter, & Taunton, 1996). Once radiologic technology students graduate, become certified, and become employed, they will continue to develop professional values through the socialization process (Wynd, 2003). Therefore, it is imperative that the socialization process provides a positive outcome.

Professional socialization involves a complex sequence of perceptions, skills, values, and interactions and is a process that extends over the lifetime of the allied health professional (Tompson & Ryan, 1996). Allied health students are influenced by a variety of individuals during the course of their educational program and the influence continues when they enter the healthcare environment. Once allied health students graduate, they are no longer under the protective shield of program faculty, new graduates must continue to learn the attributes and roles of a professional through modeling and socialization (Brown, 2004; Tompson & Ryan, 1996). When graduates join the workforce, they are socialized into becoming members of a community and develop a sense of belonging to an organizational, and departmental community as well as their occupational community. (Brown, 2004).

## **Significance of the Problem**

Even though the profession of radiologic technology has been in practice for over 100 years, it was not until January of 2015 that an associate degree was required for the entry level radiologic technologist (ARRT, 2008). Prior to 2015, radiologic technologists' entry level education was a certificate. Therefore, the radiologic technology profession was not formally recognized as a profession until the degree requirement was implemented.

Radiologic technology programs may be accredited by the Joint Review Committee on Education in Radiologic Technology (JRCERT) through a peer-review process (JRCERT, 2014). The JRCERT is the only accreditation agency recognized by the U.S. Department of Education (DOE) to accredit education programs in radiography and radiation therapy (Baker & Dunn, 2006). The JRCERT has set Standards for an Accredited Educational Program in Radiologic Sciences and accreditation is awarded to programs demonstrating substantial compliance with the standards. Radiologic technology programs undergo a comprehensive on-site visit by site visitors to ensure the standards are being met. Accredited radiography programs are required to measure professionalism in their students as a student learning outcome (JRCERT, 2014). However, this task is very difficult, given that the profession has not articulated the professional values of the radiologic technologist. The accreditation process provides public assurance that a program meets a basic level of educational quality.

The ASRT publishes a Radiography Curriculum to ensure that radiologic science programs match the profession's standards (ASRT, 2016a, 2016b). Educators must teach professional attitudes and behaviors, essential clinical skills, and also ensure radiologic

technology students are prepared for the certification examination offered by the ARRT. The curriculum includes general education courses, technical skills, pre-professional, and professional core content. However, RT educators must include education related to professional values to ensure the development of a professional identity for the radiologic technologist which includes certain unique attributes such as role, values, behaviors, attitudes, and beliefs (Peer & Schlabach, 2009). Specific skill-sets include technical competence, patient care skills, teamwork, medical information management, collaboration, and research methods (ASRT, 2012). More emphasis on education regarding professional values will support the formulation of a professional identity for radiologic technologists. The radiologic technologist is expected to act as a professional in caring for patients and assimilate attitudes and behaviors of the radiologic science profession (Clark, 2009).

Practicing clinicians can use the professional values as a guiding document for practice (Schlabach, 2017). The declaration of professional values will promote values-based behaviors and internally motivate a duty to uphold the legal, ethical, and regulatory standards of the profession. The key issues that seem to personify the culture of the radiography profession include low professional status, apathy and resistance to change, lack of professional recognition from other healthcare professionals, and lacking autonomy because the functions of the profession revolve around supporting the medical profession (Sim & Radloff, 2008; Yelder & Davis, 2009). Radiologic technologists are seen as protocol-driven with blind adherence to protocols and not as autonomous. Also, radiologic technologists generally apply knowledge generated through research activities of medical practitioners and physicists, not radiologic technologists (Nixon, 2001). The

radiography profession needs a multi-faceted approach to overcome these issues (Yielder & Davis, 2009). If these issues remain unchallenged they may limit both ongoing professional development of RTs and the future of the profession (Sim & Radloff, 2008). One approach may include a new focus on professionalism and the perceived importance of professional values.

Currently, there is only one study on the professional identity of radiologic technologists (Niemi, & Paasivaara, 2007). Niemi and Paasivaara (2007) determined the factors affecting professional identity of radiologic technologists. These factors include technical discourse, safety discourse, and professional discourse. Professional discourse included an emphasis on professional identity. A significant factor for professional identity was supporting professionalism (Niemi, & Paasivaara, 2007). Research of RTs perspectives on professional values will support professionalism.

Research on professionalism and professional values have been conducted on many other allied health professions; such as, nurses, physical therapists, physicians, physicians-in-training, occupational therapists, and physician assistants. These professions have identified professional values for their distinctive professions (Clark, 2009; McGinnis et al., 2016; Schlabach, 2017). The purpose of this study is to determine the importance of professional values from a RTs perspective. The examination of professional values from a RTs perspective bears investigation to add to the professional identity of the radiologic technologist.

Data gathered will lead to the adoption of professional values by the radiologic technologists' professional community. A determination of the perception of professional values in practicing radiologic technologists should lead to the proper assessment of

professionalism in radiologic technology students. Once professional values are determined, faculty members will be able to incorporate teaching these values in the radiologic sciences curriculum. Additionally, faculty members may utilize the Radiologic Technologists' Perceptions of Professional Values Scale to assess professional values in radiography students. The practicing radiologic technologist can utilize the RTPPVS to develop an awareness of the core values and to self-assess the frequency with which he or she demonstrates the values based on the sample indicators. Also, when professional values are determined, the radiology manager, utilizing the RTPPVS, can address the need for education, or remediation, for radiologic technologists.

### **Statement of the Problem**

The profession of radiologic technology has not identified and explicitly articulated professional values (Nortje' & Hoffman, 2017). In many healthcare disciplines, professionalism is demonstrated by the extent to which members of a profession are motivated by shared professional values that uniquely define the profession (Guenther, McGinnis, Romen, & Patel, 2014; Nixon, 2001; Schlabach, 2017). Professional values define expected behaviors for the profession (Guenther, et al., 2014; McGinnis, Guenther, Wainwright, 2016; Schlabach, 2017). Radiologic technology is struggling to be recognized as a profession (Sim & Radloff, 2009). Currently, the profession is guided by two documents: the practice standards and the standards of ethics. However, these two documents do not clearly identify professional values. Identifying and articulating the importance of RTs professional values will support continued growth of the profession.

The aim of the ASRT curriculum is to provide a framework of a common body of knowledge that is essential for entry-level radiologic technologists (ASRT, 2016a). The curriculum serves as a guide for educators to follow in designing their programs and ensuring that their programs match the profession's standards (ASRT, 2016a). Besides course requirements and clinical requirements, the curriculum includes professional characteristics. Therefore, radiologic science educators must ensure professionalism is taught in the curriculum.

Hospitals across the nation address the challenge of disruptive behavior daily (Brooks, Polis, & Phillips, 2014). Disruptive behavior interferes with patient safety and adversely affects the teamwork in the work environment needed to ensure positive clinical outcomes. Disruptive behaviors are non-teamwork-promoting behaviors by medical professionals that undermine healthcare quality and a culture of safety, decrease staff morale, increase healthcare expense, and increase litigation risk (Reiter, Pichert, & Hickson, 2012). Ultimately, disruptive behavior impacts the team's ability to achieve intended outcomes. Therefore, articulating the importance of professional values will provide a framework for the radiologic technology profession for clinical practice.

Educators in higher education have witnessed an increase in academic incivility in the classroom and clinical setting (Clark, 2017). Student incivility includes actions that hinder the instructor's ability to teach and prevent other students from learning. In addition to academic dishonesty, student incivility includes tardiness, sleepiness, bullying, disrespectful conduct, and passive aggressive behaviors. Educational programs that are preparing students for an allied health profession should ensure students are aware of the expectations of the profession (Cox & Killion, 2010; Papadakis, Hodgson,

Teherani, & Kohatsu, 2004). Expectations include professional values. The radiologic technology profession should include professional values when educating students in professionalism.

Based on the need to examine the perception of professional values for practicing radiologic technologists, the following research questions and hypotheses were addressed in this study.

### **Research Questions and Hypotheses**

Based on the need to examine the perception of professional values for practicing radiologic technologists, the following research questions were addressed in this study:

Research Question 1: Which professional values are perceived as most important to practicing radiologic technologists as measured by a mean score of 3.0 or greater?

Research Hypothesis: If a professional value is scored as 3.0 or greater, then it will be perceived as important to practicing radiologic technologists.

Research Question 2: Do ASRT members perceive it important for the radiologic technology profession to explicitly articulate professional values as measured by a score of 4.0 or greater?

Research Hypothesis: If a mean score of 4.0 or higher is achieved, then it will demonstrate the importance of the profession of radiologic technology explicitly articulating professional values.

Research Question 3: Are there significant differences in the perceived level of importance of professional values between radiologic technologists' according to demographic characteristics?

Statistical Hypothesis: There is no significant difference between perceived level of importance of professional values and the demographic characteristics of level of education, years of experience, job position, age and gender.

### **Limitations of the Study**

The limitations of this study were as follows:

1. The population of this study was limited to practicing radiologic technologists that are members of the ASRT. Generalizations may not be applicable to other populations or programs.

2. This research was purposeful and convenient, not a longitudinal sample, thereby limiting the results. The population of practicing radiologic technologists were licensed in various states.
3. Personal values develop from previous work and life experiences and may have influenced the importance of professional values of participants. Radiologic technologists may have chosen to participate due to higher personal values, thereby influencing the results.
4. Radiologic technologists perceive professional values to be desirable. The Questionnaire Likert scale survey has five options ranging from most important to not important. Participants may have scored an item high because they thought that was what they should do, instead of reflecting on their own values, this is known as response bias.
5. The survey instrument was originally designed for a different group of allied health clinicians, physical therapists, not radiologic technologists.
6. Participants may not have taken time to give reflective thought to the questions resulting in data that is less in-depth.

### **Definition of Terms**

*American Registry of Radiologic Technologists (ARRT)* is the world's largest organization offering credentials in medical imaging, interventional procedures, and radiation therapy. The ARRT certifies and registers technologists in 15 disciplines by overseeing and administering education, ethics, and examination requirements (ARRT, 2016).

*American Society of Radiologic Technologists (ASRT)* is a national organization representing all registered radiologic technologists. The mission of the ASRT is to advance and elevate the medical imaging and radiation therapy profession and to enhance the quality and safety of patient care (ASRT, 2016a).

*Louisiana State Radiologic Technology Board of Examiners (LSRTBE)* is the regulatory agency that licenses radiologic technologists in the state of Louisiana.

*Personal values* are values that are developed from the influence of one's culture, ethnic background, religious background, society, and family (Blais, Haynes, Kozier, & Erb, 2006).

*Practice Standards* are a guide for appropriate practice. Published by the ASRT, the practice standards define the practice and establish general criteria to determine compliance (ASRT, 2016b).

*Professional socialization* is the method of developing the values, beliefs, and behaviors of a profession (Blais et al., 2006, p. 507).

*Professional values* are "beliefs about the worth or quality of concepts and behaviors in a discipline" (Leners, Roehrs, & Piccone, 2006, p. 507).

*Registered Radiologic Technologist* is an individual certified to practice radiologic technology by passing a national, standardized examination administered and registered by the ARRT (2016).

*Standards of Ethics* provides proactive guidance on what it means to be qualified and to motivate and promote a culture of ethical behavior within the profession (ARRT, 2016). The ethics requirements support ARRT's mission of promoting high standards of patient care by removing or restricting the use of the credential by those who exhibit behavior inconsistent with the requirements.

*Values* "refer to one's evaluative judgments about what one believes is good or what makes something desirable" (Butts & Rich, 2005, p. 30). "Values are freely chosen, enduring beliefs or attitudes about the worth of a person, object, idea, or action" (Blais et al., 2006, p. 48).

### **Definition of Assessment Instrument**

The Radiologic Technologists' Perceptions of Professional Values Scale is a Likert response survey consisting of 61 items. Participants were asked to report their perception of the importance of radiologic science professional values and sample indicators on a scale of five responses ranging from not important to most important. The survey instrument was a modification of the *Professionalism in Physical Therapy Core Values Self-Assessment* survey because there is no known instrument for radiologic technologists. The practice standards (ASRT, 2016b), the standards of ethics (ARRT, 2016) and professional input were used to guide the revisions.

### **Summary**

The importance of professionalism continues to be discussed and studied in the literature. The identification of professional values has been studied in many allied health care disciplines, but not in radiologic technology. Radiologic Technology has evolved immensely since its inception, and continues to do so. This evolution included a change in the education requirement of the entry-level radiologic technologist. Radiography was the last of the major health professions to move to a degree requirement (Nixon, 2001).

The perception of the importance of professional values for radiologic technologists will be reported and this information contributes significantly to the professional identity of radiologic technologists. Once professional values are identified, radiologic science educational programs will be better equipped to teach and assess professional values in the professional radiography curriculum. Also, practicing radiologic technologists can use the RTPPVS for self-assessment and radiology directors

can use the professional values to decide if continuing education is needed for radiologic technologists.

## **CHAPTER 2**

### **REVIEW OF RELATED LITERATURE**

#### **Introduction**

A review of the literature related to professional values in allied health professions will be presented. Concepts relevant to this topic include development of personal and professional values, entry level into the radiologic technology profession, and the ARRT Standards of Ethics and the ASRT Practice Standards. The theoretical framework includes Feldman's contingency model of organizational socialization. Research related to professional values and professional identity is also presented. Previous studies of the perceptions of professionalism of radiologic technology students are discussed. A discussion of the adoption of professional values by other allied health professions will also be presented.

#### **Theoretical Framework**

Socialization is the "process by which persons acquire the knowledge, skills, and dispositions that make them more or less able members of their society," (Brim, 1966, p. 4). This process was described by Daniel Feldman in his three stage model of contingency theory of organizational socialization (Feldman, 1976). Feldman's contingency model of organizational socialization provides the theoretical framework for this research. According to Feldman, organizational socialization is "the process through which individuals are transformed from outsiders to participating, effective members of an organization" (1976, p. 15). Feldman theorized there are three stages in the

socialization process: anticipatory socialization, accommodation, and role management. Anticipatory socialization is likened to ‘getting in’ to the organization, while accommodation would be ‘breaking-in’ and role management would be ‘settling-in’ (Boyle, et al., 1996). During the getting-in stage, potential employees attempt to gain information about an organization from available sources, such as websites and professional journals. The breaking-in stage includes orientation and learning organizational, as well as, job-related procedures. The settling-in stage closes when an individual reaches full member status in the organization.

In 1996, Boyle, Popkess-Vawter and Taunton modified Feldman’s contingency theory. The modified theory further defined socialization as the “acquisition and internalization of the role conceptions skills, and behaviors that define an organizational or professional role” (p. 142). The modified contingency theory included the addition of variables to each stage for further clarification of the role of socialization according to Boyle et al. (1996). Every stage has distinctive interactional variables, which are elements such as people and procedures, or protocols, that influence the process of socialization.

Students in professional education programs initially learn professional values and standards of that profession in the education setting of the various educational programs through formal learning and socialization. Therefore, it is assumed that radiologic technology students learn in the same manner. Duquette (2004) found that the development of professional values in nursing students was facilitated through learning in formal lectures, experiences in healthcare settings and role modeling by the faculty and practicing nurses. These methods also contribute to the professional socialization of

students into the radiologic technology profession. Socialization begins as soon as the student enters the clinical environment (Challen et al., 2016). Students will observe the attitudes and behaviors of practicing radiologic technologists and assess differences between the theoretical content and its delivery.

Organizational socialization involves the process by which an individual adapts to a specific role in an organization (Chao et al., 1994). According to role theory, as new employees are assimilated into organizations their behavior will be modified in the direction of peer group behavior (Boyle et al., 1996). Once radiologic technology students graduate, become certified, and become employed, they will continue to develop professional values through the socialization process (Wynd, 2003).

The goals and purposes for the radiologic technology student are to learn coursework, to succeed in school, graduate, become certified, and gain employment (Cox & Killion, 2010). The delivery of radiography education has advanced over the past 50 years, migrating from an on-the-job training style to an academic, degree-centered format. Each student is a unique individual who experiences formal education differently (Clark, 2009). As individuals, they each perceive, learn and evaluate the subject matter through filters of previous learning. Though radiologic technology students will receive much of the didactic information together, students have the opportunity to learn in small groups in clinical courses under the tutelage of faculty and clinical instructors (Clark, 2009). Each clinical instructor provides guidance in professional values through methods such as role modeling, discussion, feedback, and evaluation. Students must demonstrate professional values in the clinical setting as it is essential to the practice of radiologic technology (Cox & Killion, 2010). To what extent students develop professional values

will vary based on their personal history, natural abilities, educational experiences, and openness to the concepts (Schlabach, 2017).

Assimilation of professional values after graduation may be influenced by continuing formal education or attending professional conferences (Clark, 2009). In addition, radiologic technologists may be influenced by their experiences with practicing radiologic technologists, patients, colleagues, or other professionals (Schlabach, 2017). Colleagues or supervisors may also influence the radiologic technologist by encouraging membership and participation in professional organizations. This interactive process is called professional socialization (Blais et. al., 2006).

### **Professional socialization.**

Professional socialization contributes to the development of values and one's identity as a radiologic technologist through "incorporating values, skills, behaviors, and norms for professional practice" (Blais et al., 2006, p. 19). When someone is acclimated to the culture of a profession, the values and attitudes of that profession are internalized resulting in desired behaviors (Gray & Smith, 1999). Socialization is the "process by which persons acquire knowledge, skills, and dispositions that make them more or less able members of their society," (Brim, 1966, p. 3) and it is a continuing process for persons being socialized. In the current study, socialization is further defined as the acquisition and internalization of the role conceptions, skills, and behaviors that define an organizational and professional role (Cohen, 1981).

Feldman (1976) posed a model of individual socialization into organizations. Feldman described three stages of socialization, identified activities for each stage, and described the personal and organizational contingencies that control an individual's

movement through the stages. Feldman interviewed 118 hospital employees, including radiologic technologists, nurses, and nurses' aides, to create, improve, and test the model of the contingency theory of socialization. The model was upheld by the data. Four variables were recognized as potential conclusions of the socialization process: basic satisfaction, shared influence, internal work motivation, and job involvement. Two of the variables, satisfaction and influence, were connected to essential features of the socialization process, and appeared to increase gradually as individuals proceed through socialization.

Prior to Feldman's study, researchers of organizational socialization literature focused on ways in which the individual learned the culture and values of the new job setting (Beck-Jones, & Perryman, 2015). Since Feldman's study, other terms have been used, but the principle is the same, preparing individuals for the workplace. The process begins while a student is enrolled in a professional plan of study. Feldman studied two types of variables in the socialization-as-adjustment process and created the contingency theory of socialization. Feldman's contingency theory of socialization, which indicates that socialization into professional work roles occurs through three stages, was used as the theoretical framework for this study (1976).

#### **Process and outcome variables of socialization.**

The first stage of the socialization process is anticipatory socialization (Feldman, 1976). This stage includes all of the learning that occurs before the employee enters the organization. The core activities the individual engages in at this stage are forming expectations about the job and making decisions about employment. During anticipatory socialization, there are two process variables that denote progress through socialization,

realism and congruence. Realism is the extent to which employees have a perception of what working in the organization entails. Realism specifies how successfully they have accomplished the information sharing and evaluation portion of their recruitment.

Congruence is the level to which the organization's resources and individual needs and skills are compatible. Congruence indicates how successful employees have been in making employment decisions.

The second stage of the socialization process is accommodation; this is when the individual learns more about the organization and decides to become a contributing participant of the organization (Feldman, 1976). The components of this stage include discovering new tasks, forming personal connections with coworkers, refining their roles in the organization, and assessing their progress in the organization. Initially, the new employee must learn the new tasks and assimilate themselves as part of the work group. Once the employee learns the tasks, he will become accepted and trusted by coworkers. Next, the employee understands his role, the tasks involved, and his place in the group. The last phase of accommodation includes assessment of the workers' performance by the supervisor and the worker.

According to Feldman, the last stage of socialization is role management (1976). In this stage, newcomers have reached an awareness of problems in the work group, and must attempt to mediate the conflicts in their group. Also, new workers become aware of other groups that may place demands on them. There are mainly two types of discords to be managed at this stage: conflicts between work-life and home-life demands; and conflicts within their work group and other groups in the organization.

Finally, there are four variables identified as “possible outcomes of socialization; general satisfaction, mutual influence, internal work motivation, and job involvement” (Feldman, 1976, p. 436). General satisfaction is the extent to which the employee is satisfied and pleased in his work life. Mutual influence is the degree to which an employee feels some power in the manner that work is carried out in their department. Internal work motivation comprises self-motivation of the employee to function efficiently on the job. Lastly, job involvement is the level to which employees are individually dedicated and involved in their work. Job involvement is related to the values developed in the socialization process and with the adoption of organizational goals. Figure 1 indicates the process and outcome variables of socialization.

Figure 1. Process and outcome variables of socialization.

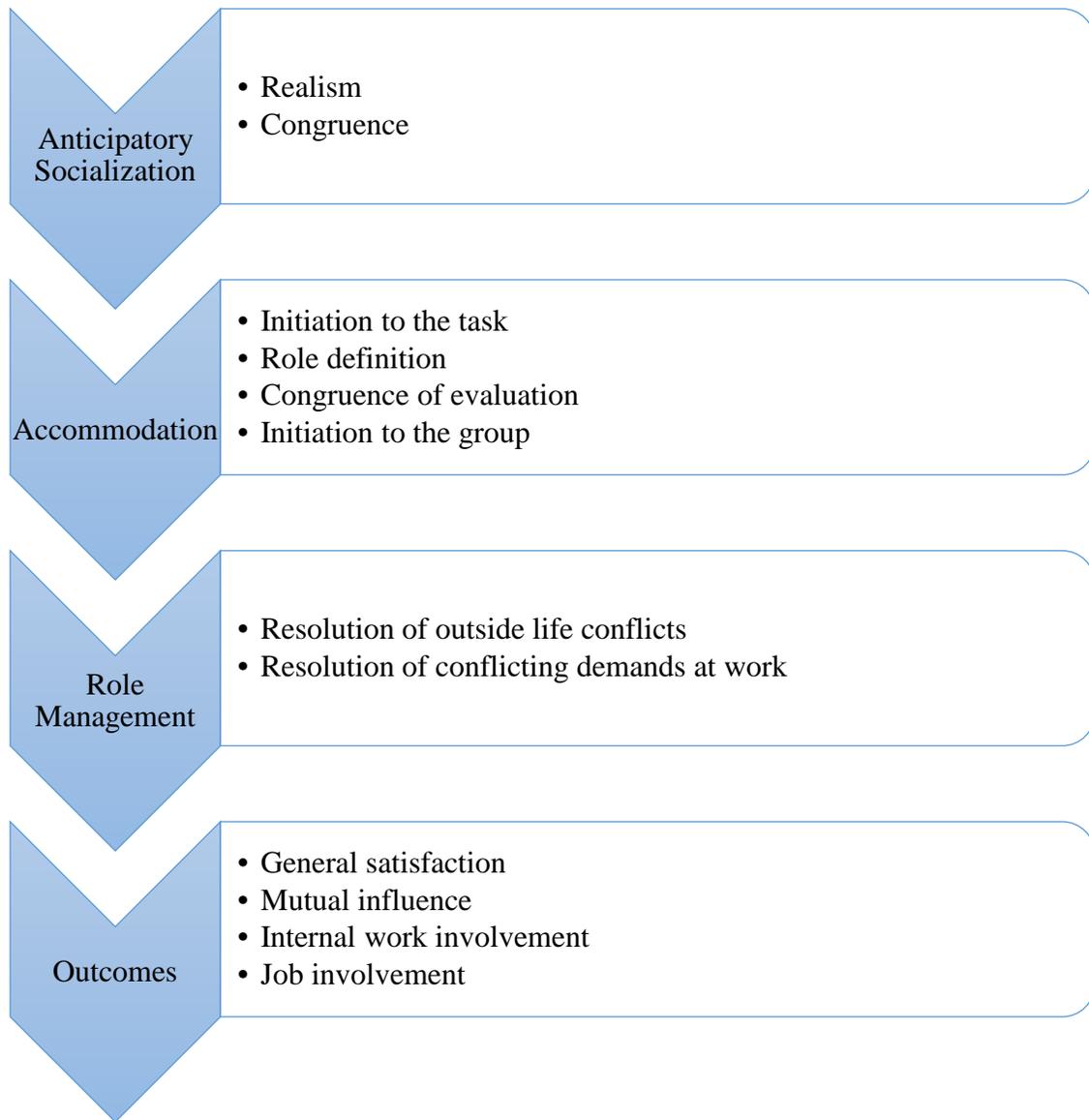


Figure 1. Adapted from Feldman, D.C. (1976). A contingency theory of socialization. *Administrative Science Quarterly*, 21(3), 433-452.

Boyle et al. (1996) also performed a study utilizing Feldman's contingency theory of socialization for graduate nurses in the critical care setting. The socialization variables of "precepting, support systems, assignment congruence, role conception, self-confidence, affective responses, commitment, job satisfaction, confronting reality, mutual influence, resolution of outside life conflicts, and resolution of conflicting demands at

work were measured” (Boyle et al., 1996, p. 143). The main activities that new employees engage in during the accommodation stage are learning new tasks, establishing new interpersonal relationships with coworkers, clarifying their roles in the organization, and evaluating their progress in the organization (Feldman, 1976). Boyle et al. (1996) discovered that adequately socialized nurses have positive role conception, high self-confidence, low anxiety (affective responses), high organizational and professional commitment, high job satisfaction, and low role conflict and role ambiguity (confronting reality). The length of the accommodation stage is not specified clearly in the literature; this stage can last from six months to two years.

### **Practice Standards of Radiologic Technologists**

Throughout history, societies have developed their own code of ethics, including those pertaining to the practice of medicine (Barron & Kim, 2003). Most healthcare professions have adopted a set of ethics. The radiologic technology profession is guided by two documents, *The Practice Standards for Medical Imaging and Radiation Therapy*, published by the ASRT (2016) and the *Standards of Ethics*, published by the ARRT (2016). The practice of radiology includes imaging, patient management, therapy, and research. In each of these areas, there are ethical issues guiding performance and decision making (Barron & Kim, 2003; Nixon, 2001). The complexity of the health care environment in which radiologic technologists work continues to increase. Contributing to this complex environment are factors such as staffing shortages, continual advanced technological innovation, constraints in the economic practice, and increasing diversity in patient populations being served (American Society of Radiologic Technologists

[ASRT], 2015; Barron & Kim, 2003). These factors often contribute to ethical dilemmas for radiologic technologists.

For radiologic technologists to work through ethical dilemmas, they need to have knowledge of and assimilate the practice standards and standards of ethics (American Registry of Radiologic Technologists [ARRT], 2016; ASRT, 2016b). Some ethical dilemmas faced by radiologic technologists include confidentiality, security, and competence (Barron & Kim, 2003). When facing an ethical dilemma, radiologic technologists use professional values to determine solutions. The professional practice standards of radiologic technology assist the radiologic technologist in making decisions that are in line with the Code of Ethics for the profession, the established ethical standard for the radiologic sciences profession (ARRT, 2016, ASRT, 2016b).

The ARRT Standards of Ethics includes *The Code of Ethics* (ARRT, 2016) which serves as a guide for certificate holders to evaluate their professional conduct as it relates to patients, healthcare consumers, employers, colleagues, and other members of the healthcare team. The Code of Ethics is intended to promote ethical conduct in providing for the protection, safety, and comfort of patients (ARRT, 2016). The Code of Ethics is ten statements of professional attitudes and behaviors that cause one to act in the best interest of the patient (See Appendix A). The Code of Ethics includes a statement regarding the professional behavior of the radiologic technologist. The remaining statements include: advancing the profession, patient care, evidence-based practice, assessment of patient and situations, acts as an agent to provide information for the physician, minimizes radiation exposure to the patient, practices ethical conduct, respects the patient's privacy and strives to improve the profession (ARRT, 2016).

The American Society of Radiologic Technologists (ASRT) and American Registry of Radiologic Technologists (ARRT) developed the practice standards and the standards of ethics for the profession to inform the public of expectations of radiologic technologists of the profession and as a guide for radiologic technologists' professional behavior. The ARRT developed and enforces the Standards of Ethics. The standards are intended to promote the protection, safety, and comfort of patients. All certificate holders are required to notify the ARRT of any ethics violation, including state licensing issues, criminal charges, and convictions (2016). Certificate holders who violate the Standards of Ethics will be sanctioned. The sanctioned individuals are posted on the ARRT website. The ten statements comprising the Standards of Ethics for Radiologic Technologists promote competent, respectful and empathetic radiologic technologists as well as the profession. (ARRT, 2016). Commitment to these values provides a solid ethical base for all registered radiologic technologists, regardless of educational background.

### **Professionalism**

Professionalism is a critical element between the medical profession and society that is based on trust and putting the needs of patients above all other matters (Barron & Kim, 2003; Brennan & Monson, 2014; Monrouxe, Rees, & Hu, 2011; Nixon, 2001; Nortje' & Hoffman, 2017). A great deal of literature has been published defining professionalism, including desirable individual characteristics and behaviors and how they may be taught, encouraged, and measured. Medical and allied health educators are tasked with developing and delivering a curriculum that emphasizes, supports and measures students' professionalism. Additionally, rather than merely acting

professionally, allied health students are expected to become professionals and to embody a suitable professional identity.

Professionalism is difficult to define because it is very complex with many facets (Butler, 2009; Nixon, 2001; Sim & Radloff, 2008). Professionalism can be defined as individual attributes that reside within a person. There are also attributes of the social interaction between individuals. One of the definitions of professionalism includes focusing on the role of doctors, specifically “how they meet their responsibilities to individual patients and communities” (Robinson, Tanchuk, & Sullivan, 2012, p. 279). This definition comprises both internal (i.e. competency) and external (e.g. a commitment to scholarship) constructs, and argues for professionalism to be considered at individual and collective levels. Stern (2006) stated that “professionalism is demonstrated through a foundation of clinical competence, communication skills and ethical and legal understanding, upon which if built the aspiration to and wise application of the principles of professionalism: excellence, humanism, accountability, and altruism” (p. 19). Again, this definition can be translated to allied health professionals as well.

Multiple professions have published their definition of professionalism, including characteristics that are relevant for the specific profession (Niemi & Paasivaara, 2007; Peer & Schlabach, 2009; Schlabach, 2017; Sim & Radloff, 2008). Even though the purpose and actions vary greatly, there are several characteristics that provide a general definition of professionalism. Some of the characteristics, or professional values, that are common throughout many professional include autonomy, integrity, honesty, collegiality, altruism, responsibility, and the pursuit of excellence (Seyler, 2012).

Some common characteristics, or professional values, throughout many allied health professions include autonomy, integrity, honesty, collegiality, altruism, responsibility, and the pursuit of excellence (Seyler, 2012). Knight and Moser (2009) conducted a quantitative study in an attempt to define professionalism in physician assistant students. Ultimately, 12 dimensions of professionalism were defined. The dimensions of professionalism included:

- Takes responsibility for actions
- Commitment to service to others
- The value of lifelong learning
- Commitment to equality of care
- Honesty
- Open-mindedness
- Professional attire
- Punctuality
- Confidentiality
- Participating and taking responsibility for the learning process
- Ability to give or receive criticism
- Values new challenges (Knight & Moser, 2009, p. 27)

Each of these dimensions are part of the definition of professionalism. The research concluded that educators need to integrate teachings within a theoretical framework of attitude and behavior when teaching professionalism. Professionalism definitions vary according to differing cultures, including the country one lives in, theoretical perspectives of authors and journals, and traditional versus new professionalism literatures (Cohen, 2006).

The American Board of Internal Medicine (1995,) described these elements of professionalism for physicians and physicians-in-training:

- altruism – patients’ best interest before self-interest
- accountability – to patients, society, and the profession
- excellence – exceed expectations and commit to lifelong learning

- duty – commitment to service in the community and professional organizations
- honor and integrity – obeying personal and professional codes, being fair, truthful, straightforward, and meeting commitments
- respect for others – patients and their families, colleagues and other health professionals (p. 5-6)

A professional is someone who is characterized by or conforming to the technical or ethical standards of a profession (Butler, 2009). In the case of the allied health professional, this comes from an understanding that our actions are always in the best interest of the patient, not ourselves. In recognition of the evolving importance of professionalism, the Radiological Society of North America (RSNA), international society of radiologists, medical physicists, and other medical professionals, formed the Committee on Professionalism in 2005 that led to the *Physician's Charter of Professionalism*, a collaborative document with international members of the broader medical community (Radiological Society of North America [RSNA] Professionalism Committee, 2006). The charter lists three fundamental principles: the “primacy of patient welfare, respect for patient autonomy, and promotion of social justice in health care,” and 10 commitments to which radiology professionals should adhere (Butler, 2009, p. 103). The commitments include professional competence, honesty, patient confidentiality, appropriate relations with patients, improving quality care, improving access to care, just distribution of finite resources, scientific knowledge, trust, and professional responsibilities. Professionalism was the topic of the opening session of the RSNA's annual meeting in 2006 and has been made into an American College of Radiology (ACR) self-assessment educational module (Butler, 2009). The Charter was created to

anticipate challenges to physician professionalism exerted by ceaseless evolution in health care, especially risks to confidentiality posed by electronic patient data.

**Lack of professionalism.**

Fargen, Drolet and Philibert (2016) conducted a literature review and evaluated studies of unprofessional and dishonest behavior among medical school students. Since 1980, there are 51 publications containing quantifiable data on unprofessional behavior. These findings have spread to other allied health professions as well. The effects of unprofessional behavior in medicine are well documented, and include the perception of poor clinical outcomes, lower patient satisfaction, increased recruiting costs, and lower employee satisfaction (Roberts et al., 2014). There is mounting evidence that an environment in which professionalism is not promoted, or where acceptable behaviors are not clear and enforced, can result in medical errors, adverse events and unsafe conditions, for health care professionals and patients (Shapiro, Whittemore, & Tsen, 2014).

In 2008, The Joint Commission, the body which accredits and certifies hospitals for health insurance programs, released *Sentinel Event Alert No. 40* which connected disruptive behavior to medical errors, poor patient satisfaction, preventable adverse outcomes, increased staff turnover, and higher costs of care, including malpractice (The Joint Commission, 2008). The Joint Commission became so concerned with behaviors that undermine a culture of safety that it recommended that all hospitals should establish a formal code of conduct (DuPree, Anderson, McEvoy, & Brodman, 2011). The code of conduct should define acceptable, disruptive, and inappropriate behaviors. The Joint Commission also required hospital leadership to create a process for reporting, evaluating, and managing unprofessional behaviors (Stewart, Wyatt, & Conway, 2011).

**Disruptive behaviors.**

Brooks et al. (2014) reported an increase in disruptive behaviors in high stress areas, such as hospitals. According to the American Medical Association, disruptive behavior is defined as “a style of interaction with physicians, hospital personnel, patients and family members, or others that interferes with patient care” (2007, p.57). Disruptive behaviors can be manifested in obvious manners such as verbal threats or yelling, or in more passive ways, such as condescending language or lack of response to telephone calls. Passive-aggressive behavior can also interfere with individual performance, team cohesion and system reliability (Reiter et al., 2012). Other common terms for disruptive behavior include lateral violence, incivility, bullying and horizontal violence (Lux, Hutcheson, & Peden, 2014). Ultimately, disruptive behavior hampers patient safety and harmfully influences the teamwork in the work environment necessary to ensure positive outcomes for the patient (Brooks et al., 2014).

Disruptive behaviors impact patient care and costs (Rawson et al., 2013). The disruptive medical professional affects the health care system unfavorably. The most pronounced disruptive behaviors are staff turnover due to incivility in the workplace, medical errors, and preventable procedural complications. By estimating turnover costs, preventable medication errors, and preventable procedural complications, some of the costs can be calculated. By improving the understanding of these disruptive behaviors, medical errors, as well as health care expenses, can be reduced. Rawson, et al, (2013) found that one disruptive member of the healthcare team has a significant economic impact on hospital costs and patient safety, costing a typical 400 bed hospital millions of dollars per year. Allied health professionals should be educated on the effects of incivility

and disruptive behaviors. Better management of these behaviors can result in improved patient care and safety (Rawson et al., 2013).

The Institute for Safe Medication Practices (2014) conducted a survey on bullying, incivility, intimidation, and other forms of disrespectful behavior. Many healthcare individuals remain silent or make excuses to minimize the damage that disrespectful behavior leaves in its wake. Some individuals may not be aware that their behavior is disrespectful to others because they are not confronted. These behaviors range from obvious acts of abuse and bad behavior to deceptive actions, so embedded in our culture that they seem normal, such as gossip, swearing and sarcasm. Any behavior that causes reluctance of staff or patients to speak up or interact with a person because he or she anticipates that the encounter will be unpleasant or uncomfortable, fits the description of disrespectful behavior. The Institute for Safe Medication Practices survey (2014), which had 4,884 respondents, revealed that disrespectful behaviors were not isolated events, and were not limited to just a few practitioners, the disrespectful behaviors involved both peer-to-peer and inter-disciplinary staff, and not just physicians, and the behaviors involved both genders equally.

The 1999 Institute of Medicine (IOM) Committee on Quality of Health Care in America report *To err is human: Building a safer health system* launched the patient safety movement (IOM Committee on Quality of Health Care in America, 1999). This patient safety movement promoted responsibility with safety, which was a change to the traditional culture of blame (Stewart et al., 2011). However, the IOM report also acknowledged that individual professionals' unsafe, careless or impaired behavior can sometimes harm patients (IOM, 1999). Some behaviors absolutely contribute to medical

errors (Stewart, Wyatt, & Conway, 2011). Additionally, disruptive behavior can undermine a culture of safety by its effects on teamwork and collaboration.

### **Patient Safety.**

Professionalism is a necessary ingredient in a culture of safety (DuPree, et al., 2011). A safety culture requires the highest levels of professionalism. Patient safety and quality patient care is dependent on communication, teamwork and a collaborative work environment (The Joint Commission, 2008). In the medical field, professionalism is a valued characteristic, however, not all health care professionals always conform to this ideal. Disruptive, or unprofessional, behavior, can directly contribute to medical errors (Dupree, et al., 2011; Stewart et al., 2011). Medical errors include medication errors, errors related to anesthesia, hospital acquired infections, missed or delayed diagnosis, avoidable delay in treatment, inadequate monitoring after a procedure, failure to act on test results, failure to take proper precautions, and technical medical errors (John Hopkins Medicine, 2016). A recent study from John Hopkins (2016) suggested that medical errors are now the third-leading cause of death in the United States, following heart disease and cancer. Additionally, disruptive behavior can also lead to reduced patient satisfaction, increased complaints, increased litigation risk, low staff morale and high staff turnover (Stewart et al., 2011).

Patient safety in the field of radiologic technology also includes minimizing radiation exposure to the patient, self, and other members of the healthcare team (Johnston, Killion, Veale' & Comello, 2011). Recent reports indicated that medical radiation exposure now exceeds natural/background radiation as the primary source of radiation exposure to the public (Johnston, et al., 2011; Statkiewicz-Sherer, Visconti,

Ritenour, Haynes, 2018). In spite of early recognition of the potential hazards of ionizing radiation, and research documenting these hazards over the past 120 years, problems continue concerning the safety of medical procedures that use ionizing radiation for imaging procedures (Johnston, et al., 2011). Radiologic technologists are aware of exposure increases and must be cognizant of the harmful effects of radiation exposure (Statkiewicz-Sherer, et al., 2018).

Small, Porterfield and Gordon (2015) reported an increase in disruptive behavior in the workplace. Disruptive behaviors among 2,821 healthcare workers were studied. The results showed the occurrence of verbal, electronic, and physical disruptive behavior in the work environment. There are a variety of factors contributing to the increase of disruptive behaviors (Brooks, Polis & Phillips, 2014). The factors include a lack of understanding of the problem, a lack of infrastructure to address the issue, lack of policies and procedures, and a lack of support from leadership to resolve the issues in a consistent and meaningful manner. A significant obstacle in addressing the issue of disruptive behaviors is the lack of acknowledgement that disruptive behavior is a serious problem. Although doctors and nurses describe witnessing disruptive behaviors in the workplace, they agree that they lack the tools to correct the behavior and may choose to ignore the situation and not become involved.

### **Standards of Ethics and Practice Standards**

Although professional values have not been explicitly articulated in radiologic technology that is not to say that the profession does not have values. The Standards of Ethics (ARRT, 2016) and the Practice Standards (ASRT, 2016b) are two documents that guide the practice of radiologic technology. The ethics requirements include core

professional values that encourage radiologic technologists to act in the best interests of patients (ARRT, 2016). This internalization of professional values and the resultant behavior is one element of ARRT's definition of what it means to be qualified and promote a culture of ethical behavior within the profession. The Practice Standards for a profession serve as a guide for appropriate practice, define the practice and establish customary principles to determine compliance. (ASRT, 2016). Practice standards are respected statements, recognized by the profession, for evaluating the quality of practice, service and education provided by individuals who practice in radiologic technology.

The ASRT *Radiography Curriculum*, the ASRT *Practice Standards for Medical Imaging and Radiation Therapy (Practice Standards)* and the ARRT Standards of Ethics include specific areas related to professionalism. The ASRT Radiography Curriculum lists nine professional characteristics that a graduate radiologic technologist should exhibit (ASRT, 2016a). The characteristics include prudent judgment, optimal patient care, collaboration, evidence-based practice, patient confidentiality, lifelong learning and the development of radiologic science students (ASRT, 2016a). The Practice Standards include professional performance standards that define the activities of the individual in the areas of education, interpersonal relationships, self-assessment and ethical behavior (ASRT, 2016b). The radiography professional performance standards include optimal patient care, self-assessment, education, collaboration, ethics, and research.

A lack of professionalism is a significant issue, and has been discussed in the literature (Brennan & Monson, 2014; Butler, 2009; Cohen, 2006; Nixon, 2001). The profession of radiologic technology is experiencing a rapid evolution of change (Barron & Kim, 2003). These changes, including technological advancements and new

opportunities and limitations in the economic practices of imaging, have given the radiology profession numerous areas in which the basic principles of medical ethics are being tested and challenged. The many codes of medical ethics have had little change, but adherence to them appears to be waning (Barron & Kim, 2003). The practice of radiology includes imaging, patient management, therapy and research. In each of these areas, there are ethical issues guiding our performance and decision making.

### **Professional Values**

Professional values relate to beliefs individuals have regarding what is good or desirable as a member of a profession and often expand on the individual's personal values (Blais et al., 2006). Development of professional values in radiologic technology students begins through professional socialization while the student is in the educational program (Blais et al., 2006; Keller et al., 2017). The professional values of the practicing radiologic technologists are influenced by their educational background, place of work, and more specifically, the individual's philosophy of what it means to be and act as a radiologic technologist (Niemi & Paasivaara, 2007). Healthcare professionals need to be aware of their personal and professional values and be able to care for patients who may have dissimilar values. The diversity of patients, financial constraints, and the complexity of the health care environment contribute to ethical dilemmas for allied health professionals (Makely, 2017). When faced with an ethical dilemma, the allied health professional should reflect on the expected professional values of the decision making process.

Professional values are prevailing, deeply rooted concepts that are internalized during professional education which shape future clinicians (Peer & Schlabach, 2009). In

medicine, as in many disciplines, professionalism is, in part, distinguished by the extent to which members of a profession are driven by professional values (Schlabach, 2017). In healthcare, the mark of distinction within a collective body is the degree to which the members share harmonious values. Professional values can be catalogued by recognizing corresponding values-based behaviors. Consistent behavior of professional values suggests they are engrained and automatically initiates appropriate action (Schlabach, 2017). Therefore, consistent recurrence of values-based behavior leads to an objective measure of professionalism. The professions that have unequivocally communicated their unique set of professional values convey a sense of professional distinctiveness and identity.

### **Professional Identity**

Professional identity is theorized as being directly associated with everyday radiographic practices influenced by the radiologic technologist's educational background, place of work, and more specifically, the methods and language use of her working culture (Niemi & Paasivaara, 2007). Professional identity refers to the radiologic technologist's conception of what it means to be and act as a radiologic technologist representing one's philosophy of radiography.

The radiologic technologist can identify as a professional by utilizing the identified values of the profession to guide the radiologic technologist's thinking, actions and interactions with the patient. The question of professional identity as a cultural phenomenon has been addressed in a number of nursing studies. The common finding in these studies is that a strong professional identity helps nurses develop their own mastery of the profession and assume the role of a professional in the field.

Niemi and Paasivaara (2007) sought to determine the factors contributing to the radiologic technologist's professional identity. The main components were determined to be technical, safety and professional discourses (Niemi & Paasivaara, 2007). Technical factors include responding to the changes in the technology of radiology. Equipment continues to be created and improved and radiologic technologists must keep up with the changes. The foundation for a radiologic technologist's professional identity was the mastery of technology based on professional skills and expertise, which has a meaningful effect on patient care in the form of tests performed and care received. Safety discourse includes the professional use of radiation. Components of safety included shielding, selecting proper technical factors and protecting patients and staff from unnecessary radiation exposure. The final subject of meaning in professional identity was professional discourse, a principal aspect being to promote the value of one's profession and stress professional identity (Niemi & Paasivaara, 2007). Niemi and Paasivaara (2007) concluded that the professional identity of a radiography is dual in nature, including solid command of scientific-mechanical technology while mastering the humanistic side of patient care. Professional discourse consisted of an attempt to support radiologic technologist's professional identity by conducting research and supporting professionalism. An incidental finding was that radiologic technologist's professional identity has strengthened along with the changes in education requirements.

The role of the radiologic technologist has changed over the past 20 years, as the demand for radiography services has increased markedly and the work of radiologic technologists has become more complex (Brown, 2004). The professional identity of radiologic technologists builds on their expert knowledge. Also, the professional identity

of radiologic technologists is dual in nature. On one hand, professional identity is based on solid command of technical skills; while on the other hand, it consists of mastering the humanistic approach of caring for patients. This is well evidenced in the education of radiologic technologists, which includes working in the best interest of the patient.

### **Assessment of Professionalism**

The assessment of professionalism, an evolving field, presents the challenge of evaluating a multidimensional construct and should embrace a diversity of approaches (Baldwin & Daugherty, 2006). Assessment has moved from an initial focus on the development and attainment of professional identity to the attainment of a set of identifiable positive attributes and behaviors. The primary focus has been on the measurement of professional behavior, the assumption being behavior is reflective of the underlying dimensions of professionalism; cognitive, attitudinal, personality and characteristics. Assessment should provide feedback to learners (Baldwin & Daugherty, 2006). Feedback should encourage reflection and promote changes in behavior and identity information.

Professionalism remains one of the most difficult areas of teaching, learning and assessment within undergraduate training (Goldie, 2013). Integrating professionalism into a curriculum, to make its importance both transparent to trainees and a tangible measurable outcome, remains a challenge still to be effectively resolved. Identifying students with levels of professionalism inconsistent with fitness to practice gained momentum internationally when Papadakis et al. (2004) reported a link between students' unprofessional behavior in medical school and subsequent practice as a doctor. Papadakis et al. (2004) discovered that students who received comments regarding unprofessional

behavior were more than twice as likely as students without such comments to be disciplined by the Medical Board of California when they became practicing physicians. The more conventional measures of medical school performance, such as grades and passing scores on national standardized tests, did not identify students who later had disciplinary problems as practicing physicians. The types of unprofessional behavior most strongly linked with disciplinary action were severe irresponsibility and severely diminished capacity for self-improvement (Papadakis, et al., 2005). The medical profession has responded by redefining its core values and norms, mainly in terms of character traits and observable behaviors and imposing greater collegiate authority on its members.

Additionally, patients' communications and regulatory or medico-legal pressures, must be considered (Papadakis et al., 2005). Against this backdrop of complexity, medical, and allied health educators are tasked with developing and delivering a curriculum that emphasizes, supports and measures students' professionalism. Allied health students should be taught the importance of professionalism as it relates to caring for patients and the profession as a whole (Cohen, 2006). Professionalism should be part of the allied health curriculum and should include positive and negative examples of attitudes and behaviors.

### **Goal of Professionalism**

The goal of professionalism is improved patient safety and outcomes, rewarding and meaningful careers for health care professionals, healthy formative educational environments, and successful health care organizations combined with renewed trust and respect for the medical profession (Brennan & Monson, 2014). Professionalism is an

essential quality for everyone who works in the health care setting. Individuals can be described as being “very professional” or “acting professionally.” Professionalism is difficult to define since it consists of many characteristics and behaviors. Individuals in all health care occupations display professionalism by dedicating themselves to doing their best on the job and providing and maintaining high-quality service to their patients.

### **Review of Research**

Although there is no known research concerning professional values in radiologic technologists, health care professions, such as nursing, physical therapy, medicine, and others have studied professional values and professionalism in their members.

#### **Professionalism in Physical Therapy.**

Guenther et al. (2014) conducted a study to determine the self-assessed level of incorporation of professional core values among physical therapists. Twenty physical therapists completed the *Professionalism in Physical Therapy Core Values Self-Assessment* instrument and a demographic questionnaire. The survey consists of 68 sample indicators or behaviors associated with the seven core values. The seven core values are accountability, altruism, integrity, caring/compassion, excellence, professional duty, and social responsibility. Participants were asked to rate the frequency with which they exhibit each of the sample indicators using a five point Likert scale: 5 = always, 4 = frequently, 3 = occasionally, 2 = rarely, and 1 = never (Guenther et al., 2014).

Participants most often associated with experiences in the core values of caring/compassion, accountability and integrity; and least frequently correlated with social responsibility experiences (Guenther et al., 2014). Altruistic behaviors of offering free services to the underserved were rare. No relationship was noted between

participants' varied professional and post-professional experiences related to the core values. In conclusion, six of the seven professional core values were well integrated into practice for these participants. However, social responsibility was not consistently demonstrated (Guenther et al., 2014).

### **Professionalism in Nursing.**

Nursing's professional values are clearly stated in several key documents, including the *Code of Ethics for Nurses*, *Nursing's Social Policy Statement*, and *Nursing: Scope and Standards of Practice* (Gallegos & Sortedahl, 2015). The *Code of Ethics for Nurses* is the "gold standard" of professional values for registered nurses including dignity and respect, safeguarding of privacy, responsibility, patient safety, accountability, competence, and collaboration. The Code also addresses nurses' professional behavior, commitment to the patient, responsibility for practice, duty to themselves, and role in advancing the profession (Gallegos & Sortedahl, 2015). According to the Weis and Schank (2009) professional values and their associated behaviors are the foundation of professional nursing practice and are cornerstones to guiding nurses' clinical practice.

A descriptive study, conducted by Gallegos and Sortedahl (2015), utilized the *Nurses Professional Values Scale-Revised* (NPVS-R) to measure professional values of practicing registered nurses and describe differences based on demographic characteristics, such as generation, years of experience, education, and professional role. The NPVS-R was completed by working registered nurses' at a children's hospital. The results of the study revealed that nurses' professional values differed based on characteristics, such as education, generation, job classification, and years of experience (Gallegos & Sortedahl, 2015). Nurses in the baby boomer and silent generation presented

stronger professional value orientation. Differences between generations related to broader issues, such as work ethic, organizational commitment, civility, and career expectations were also noted. Also, NPVS-R scores were lowest in nurses with 3 to 10 years of nursing experience. Nurses with baccalaureate degrees scored the lowest on the NPVS-R scale, which merits further investigation. However, once age was controlled for, there was no significant statistical difference based on highest nursing education (Gallegos & Sortedahl, 2015). Nurses performing direct patient care scored the lowest on the NPVS-R scale, while managers/directors and educators scored the highest. Patient advocacy was scored the highest by the participants in this study.

#### **Professionalism in Radiography Students.**

Nortje' and Hoffman (2017) conducted a mixed methods study on the perspectives on the development of professionalism as experienced by radiography students in South Africa. The objectives of the research study included determining if radiography students understand the concept of professionalism, investigating students' perspectives on the attributes of a radiologic technologist, examining the students' perspective of the factors that contribute to the development of professionalism and identifying educational strategies to contribute to the development of professionalism amongst radiography students.

The qualitative portion of the study consisted of open-ended questions related to the understanding of professionalism. The quantitative portion of the study consisted of structured questions related to attributes of professionalism. The 12 most prevalent attributes of professionalism, as identified in healthcare curricula, were listed and students ranked them in the order of perceived importance.

The emergent themes of the qualitative portion revealed an understanding of the concept of professionalism (Nortje' & Hoffman, 2017). The major themes regarding the concept of professionalism include the ability to gain a particular qualification and perform tasks within the profession, to abide by the rules of the profession, meet the specific expectations of the profession, and care for patients. Of the 12 attributes associated with professional radiologic technologists, the student's ranked respect, ethical behavior, altruism, and accountability as the top four. The factors contributing most to the development of professionalism were academic curriculum content, patient interactions and prior experience. Ultimately, the study concluded that it is critically important that radiography courses include teaching of professionalism and that curricula should build on the innate attributes that were identified by the student's. An additional finding of the study is that students are keyed into a more current and contemporary view of professionalism which embraces the patient-centered approach to healthcare delivery.

Challen et al. (2016) conducted a qualitative study on perceptions of professionalism amongst radiography students in Estonia. The goal of the study was to identify the students' understandings of professionalism, influencing factors of professionalism and the skills required to attain professionalism. Professionalism is difficult for students to understand because it is difficult to define. Participants were asked four questions relative to the radiography profession: "(a) What does the word professionalism mean to you? (b) What does the word unprofessionalism mean to you? (c) What has influenced your understanding of professionalism? (d) What is your current understanding of what you need to learn to become professional?" (Challen et al., 2016, p. 1079). Answers to the questions elicited four general themes related to perceptions of

professionalism: “(a) traits of professionalism, (b) common indicators of professionalism, (c) factors influencing the development of professionalism, and (d) student developmental needs in regard to professionalism” (Challen et al., 2016, p. 1080). During the study, there was no effort to define professionalism, therefore, the students’ perceptions were developed from their knowledge and comprehension of the concept through lectures in the college environment, their own personal viewpoints and beliefs, and through the observations of the attitudes and behaviors of others.

Identified professional behaviors included good technical skills, infection control, ethical conduct and communication skills (Challen et al., 2016). Unprofessional behaviors that were discovered included non-adherence to radiation safety, the most often reported, technical incompetence, and non-adherence to privacy and confidentiality. Students described a number of factors influencing their development of professionalism which included personal feelings, theoretical studies, training and the clinical environment. Lastly, students’ professional development needs were discovered (Challen et al., 2016). These needs included improving technical skills, communication skills with pediatric patients, elderly patients and patients with special needs, and learn an empathetic approach with patients. The study concluded that student perceptions result from their interpretation of the notion of professionalism through taught theoretical sessions and through the observation of the behaviors and actions of others in both the college and clinical environments. The observations provided a significant contribution in students’ belief of what constitutes professionalism/unprofessionalism and students developed personal judgement discerning appropriate/inappropriate professional behavior (Challen et al., 2016).

### **Professionalism in Allied Health students.**

Noronha et al. (2016) studied professionalism in physician assistant (PA), physical therapist (PT), occupational therapist (OT), clinical psychology (CP) and biomedical sciences students (BMS). Employers' are more concerned with professionalism behaviors than they are with specialized credentials or knowledge (Noronha et al., 2016). Allied health students are supposed to assimilate professionalism behaviors as soon as they start their clinical experiences. Therefore, allied health educational programs are tasked with developing these attitudes and behaviors in allied health students. Often, challenges or failures in clinical education relate to concerns with professionalism behavior (Noronha et al., 2016).

Given the recent interest in competent inter-professional collaboration for healthcare, it is crucial that educators develop a richer insight of the similarities and disparities in student perceptions of professionalism among disciplines (Noronha et al., 2016). Noronha et al. intended to classify and compare self-reported professionalism attitudes and behaviors in the students at the start and end of the first didactic year of their graduate programs. Noronha et al. (2016) theorized that the degree of self-perceived professionalism would differ between the clinical and basic science students and that the students' professionalism attitudes would transform after a year in their respective programs.

The survey study was administered to students enrolled in PA, PT, OT, CP and BMS programs (Noronha et al., 2016). Students completed the questionnaire during orientation week and again at the end of the first didactic year. The self-assessment instrument, *Professionalism Attitudes and Behaviors Questionnaire*, was developed for

the study to measure student professionalism attitudes and behaviors across five different health professions based on behaviors that were identified as important to each of the health professions programs (Noronha et al., 2016). The hypothesis that the level of self-perceived professionalism would vary between the clinical and basic science students and that the students' professionalism attitudes would change after a year in their respective programs was partially supported. Some students displayed an increase in self-perceived professionalism, some were unchanged and some demonstrated a decrease in self-perceived professionalism. Overall, it was revealed that students, regardless of program, reported high levels of self-perceived professionalism (Noronha et al., 2016). The study concluded that it is crucial for healthcare educators to teach and evaluate professionalism attitudes and behaviors in their students in order to meet the ever-changing professionalism expectations of the current and future healthcare environment.

Jha et al. (2006) completed a study to determine perceptions of professionalism in medicine. Interviews were conducted with medical educators, medical students, doctors, allied health professionals and lay professionals to determine views and experiences of professionalism in medicine. Interviews were used to elicit participants' perceptions of professionalism in medicine. The sample included undergraduate medical educators, medical students from each stage of the curriculum, medical doctors practicing in general medicine, surgery and primary care, allied health professionals including nurses, physiotherapists, and lastly, lay professionals, which included recipients of health care services.

The interviews were conducted and themes began to emerge (Jha et al., 2006). The themes included "compliance to values, patient access, doctor-patient relationship,

demeanor, management, personal awareness, and motivation” (Jha et al., 2006, p. 1034). Each theme revealed conceptual components, positive and negative, and behavioral components, positive and negative. The results disclosed that adhering to a set of values or moral code is a necessary aspect of professionalism. Furthermore, the participants held strong views concerning appropriate values but had difficulty expressing and defining the specific values (Jha et al., 2006). Unsurprisingly, a vital concept of professionalism was the professional-patient interaction, including an emphasis on empathy and effective communication. Appropriate appearance was defined as a component of professionalism. Management issues, such as teamwork and effective communication, were also determined to be important aspects of professionalism. Personal awareness, including self-regulation, was also included. Lastly, motivational factors, such as altruism and self-interest should be central concerns for a doctor.

At the time this study was conducted, 2006, it was the first to investigate individuals’ opinions concerning medical professionalism (Jha et al., 2006). Jha et al. findings suggested that examining medical professionalism required a more complex approach than has been addressed previously in the medical education literature. Participants rarely signified the perceptions in succinct, absolute terms but rather as broad sets of values including both desirable and undesirable examples of views and behavior (Jha et al, 2006).

### **Summary**

Professional socialization, the standards of ethics, practice standards of radiologic technologists, professionalism, and a lack of professionalism, including disruptive behaviors were reviewed. Professional values, professional identity, the assessment and

goals of professionalism were also appraised. In addition, studies were discussed as a way of understanding the identification of professional values of other allied health professions.

The problem and purposes of this study outlined and relevant literature were detailed in this chapter. Methodology, including study design and procedures, description of participants, independent and dependent variables, measurement tools, data collection, format for presenting results, reliability, and validity of the study will be described in the next chapter.

## **CHAPTER 3 METHODS AND PROCEDURES**

### **Introduction**

The perception of the importance of professional values from radiologic technologists' perspective was investigated in this study. The methods used to answer the study's research questions will be discussed in this chapter.

The research questions were answered utilizing a non-experimental, exploratory, descriptive survey design applying descriptive statistics, frequency distributions, analysis of variance, and correlations. The chapter begins with a description of the research design, followed by the research questions and hypotheses. The population and sample, the instrument used to assess professional values, the data collection process, as well as, the means of analyzing the data collected conclude the chapter.

This perception of the importance of professional values (PV) of practicing radiologic technologists, differences in the importance of professional values between radiologic technologists according to demographic characteristics, and the importance of explicit articulation of those professional values was determined in this study. Determination of the perception of professional values in practicing radiologic technologists should lead to the assessment of the same values in radiologic technology education. Once professional values are determined, these values can be incorporated into radiologic sciences curricula and clinical practice.

## Research Design

A non-experimental, exploratory, descriptive survey design was used to identify the perception of professional values in practicing radiologic technologists. Surveys were used to collect a variety of information from participants, including demographics, behaviors and opinions (Aaron, 2012). The survey, as a data collection tool, allows for internet distribution to numerous individuals efficiently, in addition, provides a mechanism for rapid response. Surveys are simple to administer and the results can be generalized to a population.

Research questions one and two utilized a research hypothesis; not a statistical hypotheses. Assumption of the responses, not probability testing, was stated by the research hypotheses (Kellar & Kelvin, 2013). Research question three utilized statistical hypothesis testing. The statistics calculated for question three included probability testing, effect testing, and a series of one-way analysis of variance (ANOVA).

An *f* test and *p*-values were calculated to determine the effects of the importance of perceived professional values among radiologic technologists with varying education levels, years of experience, job position, age, and gender. An *f* test is a comparison of the means of two populations through the use of statistical investigation and is commonly used to compare two or more groups (Kellar & Kelvin, 2013). The *f* tests' effect size of 0.50 was achieved with 80% power with a sample size of more than 63 in each group. Effect size measures the size of the difference between two groups. The *p*-value, used to determine statistical significance, is the probability of finding the observed results when the null hypothesis of a study question is true (Denton, et al., 2017). The *p*-value was

calculated from the sample. A *p-value* of less than one was established. The *p-value* was achieved for each of the demographic characteristics.

Descriptive research, which was utilized for this study, is employed to define an opinion, attitude, or behavior held by a group of people on a given subject (Locke, Silverman & Spirduso, 2010). The Radiologic Technologists' Perceptions of Professional Values Scale, adapted from the *Professionalism in Physical Therapy Core Values Self-Assessment* survey, was used to collect data on the professional values of participants (APTA, 2013; Denton et al., 2017; Guenther et al., 2014).

### **Subjects**

Sampling for this research was purposeful and convenient. Purposeful sampling is a non-probability method whereby the sample is not chosen by chance; a convenience sample is one that is selected for the purpose of the study and is convenient to the researcher (Locke et al., 2010). The sample was randomly selected from the population of radiologic technologists who are members of the American Society of Radiologic Technologists (ASRT). The participants were randomly selected from the ASRT database. The participants were randomly selected from the ASRT database. The ASRT database is provided to members of the ASRT for research purposes. To promote homogeneity of the sample, radiologic technologists certified in only radiography and listing diagnostic radiography as the primary field of practice were selected for the survey.

The ASRT, the largest association of radiologic science professionals in the United States, sent the survey to 3,500 of its membership on behalf of the researcher. Seven

hundred sixteen surveys were returned, constituting a response rate of 20.46%. The ASRT has approximately 153,000 members (ASRT, 2017).

## **Procedure**

### **Data Collection.**

Prior to data collection, the research study was submitted to the Institutional Review Board (IRB) at the University of Louisiana at Monroe for review. The IRB committee approved the research study on November 13, 2017: Research Protocol No. 783-2018. Upon IRB approval (Appendix B), the researcher contacted the American Society of Radiologic Technologists Research Director, John Culberston, who served as the facilitator for the surveys.

Data collection took place during November and December of 2017. The survey was emailed to 3,500 practicing radiologic technologists. The Radiologic Technologists' Perceptions of Professional Values Scale included an introductory paragraph detailing the research, assurance of confidentiality, information regarding informed consent, a time frame for completion of the survey and a link to the survey which is located via Survey Monkey. Expected time to complete the survey was about 10 minutes. The completion of the survey was implied consent of the participant (Locke et al., 2010). The participants were able to complete the survey electronically and responses are anonymous. The initial survey was sent to 3,500 participants on November 16, 2017. Two weeks later, a reminder email was sent to the participants and the survey closed on December 13, 2017.

### **Instrument.**

Although many instruments are available to measure professional values, attitudes and behaviors of allied health professionals, no existing survey instrument has been used

to explore radiologic technologist's perceptions of professional values. The researcher requested permission to utilize and modify the *Professionalism in Physical Therapy Core Values Self-Assessment (PTCVSA)* (Appendix C) instrument from the American Physical Therapy Association. The *PTCVSA* was created by the American Physical Therapy Association (APTA) and was adopted as a core document on professional values in physical therapy practice, education, and research in 2013 (APTA, 2013). The purpose of the *PTCVSA* is "for the user to develop an awareness about the core values and to self-assess the frequency with which he or she demonstrates the values based on the sample indicators that describe what the physical therapy practitioner would be doing in daily practice" (APTA, 2013, p. 1). Therefore, the modified *PTCVSA*, renamed the Radiologic Technologists' Perceptions of Professional Values Scale (RTPPVVS) (Appendix D), was used for the study. An item to determine the importance of the radiologic technology professional body explicitly articulating core values was added to the survey. Reliability and validity for the RTPPVVS will be discussed in chapter four.

### ***Benchmarks.***

The benchmark for research question one was 3.0. This was the same setting as used for the Professionalism in Physical Therapy Core Values Self-Assessment by McGinnis et al. (2016). The benchmark for research question two was 4.0. This was the same setting as used for the Athletic Training Professional Values Inventory survey conducted by Schlabach (2017).

### ***Reliability and validity for Professionalism in Physical Therapy Core Values Self-Assessment.***

Denton et al. (2017) used test-retest reliability analysis to examine reliability and validity of the *Professionalism in Physical Therapy: Core Values Self-Assessment*. The

overall test–retest reliability was acceptable and internal consistency reliabilities were good for most of the individual core values. Five of the seven core values consistently indicated acceptable internal consistency in this group of PT students: caring/compassion, excellence, integrity, professional duty, and social responsibility. Exploratory factors analysis (EFA) was used to test the construct validity of the items. Cronbach’s alpha was used to assess internal consistency reliability at a significance level was .05. The EFA demonstrated that the APTA Social Responsibility core value is a reliable and valid construct (Denton et al., 2017). McGinnis et al. (2016) also conducted research with the *PTCVSA* instrument. The *Professionalism in Physical Therapy: Core Values Self-Assessment* instrument is “a consensus-based document developed through a Delphi process, which establishes content validity” (McGinnis et al., 2016, p. 1426).

Denton, et al. (2017) concluded that each subset is a strong and valid construct. Overall, reliability and validity studies provided strong confidence in the use of the *Professionalism in Physical Therapy Core Values Self-Assessment* instrument.

### **Revision of the instrument.**

The Professionalism in Physical Therapy Core Values Self-Assessment instrument was developed by 18 physical therapists selected by the American Physical Therapy Association (Anderson & Irwin, 2013; Denton, et al., 2017). These therapists were identified as having expertise in physical therapy practice, education and research. The PPTCVSA consists of seven global areas of professionalism (Table 1).

The Professionalism in Physical Therapy Core Values Self-Assessment instrument consists of 59 multiple-choice questions indicating the physical therapists’ core values as identified by seven elements of professional values (Table 1) (APTA,

2013; Guenther et al., 2014). Participants rated the frequency with which they perceive the importance of each of the sample indicators using a 5-point Likert scale including: 1 = Not Important, 2 = Somewhat Important, 3 = Important, 4 = Very Important, 5 = Most Important.

The Likert scale was modified for a study by Anderson and Irwin (2013) as an ordinal response scale of 1-5 (1 = never, 2 = rarely, 3 = occasionally, 4 = frequently, and 5 = always. Anderson and Irwin determined that a score of 340 would be achieved if participants rated themselves with a “5” on all sample indicators. In this manner, if a student or practicing physical therapist scores below 300, this indicates a need for remediation of professional values. Also, demographic questions include, gender, age, level of education, years of experience, job position. The following material will explain how the PTCVSA instrument was revised to become the Radiologic Technologists’ Perceptions of Professional Values Scale (RTPPVS).

Table 1  
*Definition of the elements of professionalism*

| Elements of Professionalism | Definition   |
|-----------------------------|--|
| Accountability              | Acceptance of the responsibility for the roles, obligations, and actions that positively influences patient/client outcomes, the profession and the health needs of society.   |
| Altruism                    | The best interest of patients, not self-interest is the rule.  |
| Compassion/Caring           | The desire to identify with or sense something of another’s experience.  |
| Excellence                  | The concern, empathy, and consideration for the needs and values of others.<br>Use current knowledge and theory while understanding personal limits, integrate judgment and the patient/client perspective, challenges mediocrity, and embraces lifelong learning. |

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|                       |   |
|-----------------------|---|
| Integrity             | Adherence to high ethical principles and/or professional standards; truthfulness, fairness and doing what you say you will do.  |
| Professional Duty     | Commitment to meeting one's obligations to provide effective services to individual patients, to serve the profession, and to positively influence the health of society. |
| Social Responsibility | Promotion of a mutual trust between the profession and the larger public that necessitates responding to societal needs for health and wellness.                          |

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*Note.* Adapted from "Elements of professionalism" as defined by American Physical Therapy Association (APTA). (2013). Professionalism in physical therapy: Core values self-assessment. Retrieved from <http://www.apta.org/Professionalism/>

The *Professionalism in Physical Therapy Core Values Self-Assessment* instrument was modified for radiologic technologists, because there is no known instrument for radiologic technologists. The practice standards (ASRT, 2016b) and the standards of ethics (ARRT, 2016) were used to guide the revisions. Additionally, the researcher sought input from four respected radiography professionals when revising the instrument. The four individuals, having expertise in radiologic technology practice, education and research, were John Culbertson, director of research of the ASRT, Dr. Melissa Jackowski, competency management development specialist at Siemens Healthcare and President-elect of the ASRT, Dr. Nina Kowalczyk, organizational effectiveness consultant at The Ohio State University, and Dr. Jay Hicks, associate director for the JRCERT. The revisions, based on input from acknowledged experts and utilizing the practice standards and standards of ethics, is explained in detail.

Throughout the instrument, the word physical therapist was replaced with radiologic technologist or radiography and the word client was removed. The seven core values of accountability: altruism, compassion/caring, excellence, integrity, professional duty, and social responsibility remained the same. The majority of revisions occurred in

the sample indicators which are values-based behaviors. Sample indicators that do not apply to the practice of radiologic technology were removed and nine sample indicators specific to radiologic technology were created. The Likert scale, which measured behavior of frequency on a continuum from “never” to “always”, was revised to a scale that depicts the perception of importance ranging from “most important” to “not important”.

***Revision of each core value indicator.***

In the original instrument, there were ten sample indicators for the core value of accountability; the revised instrument contained nine. One indicator, “participating in the achievement of health goals of patients and society”, was removed. The indicator of “seeking and responding to feedback from multiple sources” was revised to read as follows: “supporting colleagues and associates in providing quality patient care”. The indicator of “assuming responsibility for learning and change” was revised to; “assuming responsibility for professional decisions”. The indicator of “maintaining membership in APTA and other organizations” was modified to; “maintaining membership in professional organizations.”

In the altruism core value, the indicator of “providing physical therapy services pro-bono” was removed. “Placing patients’/clients’ needs above the physical therapists” was modified to “acting in the best interest of the patient” and “providing physical therapy services to underserved and underrepresented populations was modified to “providing services to humanity with full respect for the dignity of mankind”. No new indicators were added to the core value of altruism.

In the compassion/caring core value, the original instrument contained 11 indicators. The revised instrument has eight indicators. Sample indicators of “designing patient/client programs/interventions that are congruent with patient/client needs”, “empowering patients/clients to achieve the highest level of function possible and to exercise self-determination in their care” and “focusing on achieving the greatest well-being and the highest potential for a patient/client” were removed. No new indicators were added to the core value of compassion/caring.

For the excellence core value, the number of indicators remained the same at 11. Two indicators were revised to align with radiography practice. “Conveying intellectual humility in professional and personal situations” was removed and replaced with “assessing situations, exercising care, discretion and judgment”. “Using evidence consistently to support professional decisions” was replaced with “practicing technology founded upon theoretical knowledge and concepts”. One new indicator, “using equipment consistent with the purposes for which it was designed”, was added to the core value of excellence.

For the integrity core value, two sample indicators were removed- “using power (including avoidance of use of unearned privilege) judiciously” and “resolving dilemmas to a consistent set of core values”. The indicator of “acting on the basis of professional values even when the results of the behavior may place oneself at risk” was revised to read “acting on the basis of professional values”. One new indicator, “practicing ethical conduct appropriate to the profession” was created.

For the professional duty core value, the number of indicators remained the same at seven. Two sample indicators were revised to reflect radiography practice. The

indicator of “demonstrating beneficence by providing optimal care” was revised to read “demonstrating beneficence by providing quality patient care”. The indicator of “facilitating each individual’s achievement of goals for function, health and wellness” was revised to read “using techniques appropriately to minimize radiation exposure to the patient, self, and other members of the health care team”. “Taking pride in one’s profession” was removed. One new sample indicator, “obtaining information for the physician to aid in the diagnosis and treatment of the patient” was added.

For the core value of social responsibility the number of sample indicators was reduced from 12 to 11. The sample indicator of “ensuring the blending of societal justice and economic efficiency of services” was removed.

In summary, the Professionalism in Physical Therapy Core Values Self-Assessment instrument was modified for radiologic technologists and renamed the Radiologic Technologists’ Perceptions of Professional Values Scale. The revision was guided by the practice standards, standards of ethics, and input from respected radiography professionals. The word physical therapist was replaced with radiologic technologist or radiography and sample indicators for radiography practice were included.

***Reliability and validity for Radiologic Technologists’ Perceptions of Professional Values Scale.***

The researcher reviewed multiple instruments related to professionalism, and professional values, before selecting the Physical Therapy Core Values Self-Assessment as a model. Some of the instruments that were reviewed were the *Nurses Professional Values Scale*, the *Student Professional Behavior Evaluation Tool*, *The Nijmegen Professionalism scale*, *The Continuum of Professional Behaviors tool*, and the

*Professionalism Assessment Rating Scale*. The PTCVSA was selected because the core values and sample indicators most closely resembled the profession of radiologic technology.

The *Radiologic Technologists' Perceptions of Professional Values Scale* was developed based on conceptual parameters developed by the APTA, which coincide with the professional values of the American Board of Internal Medicine, and was modified to reflect the RTs practice standards and code of ethics. Another reason the Physical Therapy Core Values Self-Assessment was selected was because it was straight-forward and quick to complete. The *Radiologic Technologists' Perceptions of Professional Values Scale* is also straight-forward and quick to complete.

The modified instrument was field tested on 10 radiologic technologists and reviewed by four experts from the field of radiologic technology. The modified instrument was a result of the compilation of the professional attributes of radiologic technologists.

The study of instruments used to assess values had been ongoing for decades (Denton, et al., 2017). Reliability is the exactness or reproducibility of a measurement (Crossley & Vivekananda-Schmidt, 2009; Downing, 2003). Historically, reliability is assessed by exploring the union between different respondents (inter-rater reliability), or the same respondent on multiple occasions (test, re-test reliability), or by examining several possible sources of variation in a single generalizability study. However, these approaches were inappropriate for the Radiologic Technologists' Perceptions of Professional Values Scale for the following reasons:

1. There is only one respondent who can implicitly determine the perception of the subject, and the subject is him or herself (Crossley & Vivekananda-Schmidt, 2009).
2. Perception is a state of mind and is fundamentally adaptable and is likely to dominate the emotional realm rather than the rational or structural realm (Crossley & Vivekananda-Schmidt, 2009).
3. The indicators of the instrument are not intended to offer repeat measures of a single domain, rather to conceptualize the construct of interest within a range of core values (Crossley & Vivekananda-Schmidt, 2009).

Validity is the degree to which the measurement reflects what is intended (Crossley & Vivekananda-Schmidt, 2009; Downing, 2003). For this study, the test hypotheses, which would be expected to follow if the RTPPVS, provides a measure of perception of importance of professional values. The hypotheses are listed under data analysis.

### **Statistical Procedures**

#### **Data analysis.**

Raw data from the survey were downloaded from Survey Monkey and entered into SAS ® Version 9.4 for statistical analysis. Frequencies and percentages are used to describe categorical response variables. Means and standard deviations were computed for continuous response variables. Practicing radiologic technologists' perceptions of the importance of professional values were discovered and analyzed.

For research question number one, which professional values are perceived as most important to practicing radiologic technologists as measured by a mean score of 3.0

or greater, the participants indicated their perception of the importance of the professional values using a 5-point Likert scale ranging from 5 (most important) to 1 (not important) (Table 2). The research hypothesis for this research question was as follows: If a professional value scored as 3.0 or greater, then it will be perceived as important to practicing radiologic technologists. The dependent variable is the factor total score. To determine which professional values were important, frequencies and percentages were computed for each of the 61 items in the survey. A mean score of 3.0 or greater indicates that the professional value is perceived as important.

Table 2  
*Dependent variable and description for research question one.*

| Variable                                   | Description   | Range                                   |
|--|---|---|
| Perceived importance of professional value | Degree to which the radiologic technologist perceives the professional value as important | 5 (most important) to 1 (not important) |

For research question number two, do ASRT members perceive it important for the radiologic technology profession to explicitly articulate professional values as measured by a score of 4.0 or greater, participants indicated perception of the importance of articulating professional values using a 5-point Likert scale ranging from 5 (most important) to 1 (not important). The research hypothesis indicated, if a mean score of 4.0 or higher is achieved, then it will demonstrate the importance of the profession of radiologic technology explicitly articulating professional values. The analysis of the frequency and percent of responses identified the perception of the radiologic technologists' regarding the importance of articulating professional values for the profession. Also, the total score of the item scale was computed for each radiologic

technologist. The dependent variable is the factor total score. A mean score of 4.0 or greater indicates that the radiologic technologist perceives it is important for professional values to be articulated by the profession.

Table 3  
*Dependent variable and description for research question two.*

| Variable   | Description   | Range                                   |
|--|---|---|
| Perceived importance of professional value being articulated by the profession | Degree to which the radiologic technologist perceives the professional value as being important | 5 (most important) to 1 (not important) |

For research question number three, are there significant differences in the perceived level of importance of professional values between radiologic technologists according to demographic characteristics, a series of one-way analysis of variances (ANOVA) was used to compare the 61-item total scores between demographic data with two levels (e.g. level of education, years of experience, job position, age and gender) to determine if the identified professional values are consistent across demographic variables (Table 4). The hypothesis related to this research stated: There is no significant difference between perceived level of importance of professional values and the demographic characteristics of level of education, years of experience, job position, age and gender. Analysis of variances are used to compare the total scores between demographic data with three or more levels. The independent variable, the demographic characteristic, was computed without error. The dependent variable is the factor total score and the grand total scores. The grand total for each demographic characteristic was evaluated for significance. If a characteristic was deemed significant, the factor total was analyzed. Summary tables were created for each demographic characteristic. Tukey post

hoc test, used with three or more variables, was used to maintain the overall alpha level (0.05) for comparisons for all demographic characteristics except gender.

Table 4

*Independent variables and descriptions for research question number 3.*

| Variable            | Description   | Range  |
|---------------------|---|--|
| Level of education  | Type of degree/certificate granted to the radiologic technologist upon program completion | Certificate, Associate Degree, Bachelors' Degree, Masters' Degree, Doctorate   |
| Years of experience | Number of years the technologist has been practicing in that position                     | 0-2, 3-5, 6-10, 11-15, 16-20, 21-30, 31 years or more  |
| Job position        | The current position of the radiologic technologist                                       | Staff Technologist, Senior/Lead Technologist, Supervisor/Manager, Chief Technologist, Instructor/Faculty, Program Director, Administrator<br>Corporate Representative<br>Locum Tenens (temporary staff ),<br>Assistant Chief Technologist, Other |
| Age                 | The age of the radiologic technologist  | Fill in the blank  |
| Gender              | The gender of the radiologic technologist   | Male or female   |

### Conclusion

The methodology implemented in completing the study, the design of the study, specific procedures, independent and dependent variables, measurement tools, data collection and analysis, reliability, and validity of the study were described in this chapter. The study was a non-experimental, exploratory, descriptive survey.

The survey was sent to 3,500 members of the ASRT and yielded a 20.46% response rate ( $N = 716$ ). The participants included 716 practicing radiologic technologists

residing in the United States. Demographic data indicated that the participants were predominantly female (approximately 75%) with a mean age of 49 and with a majority (approximately 45%) reported over 21 years of experience. The majority of respondents had earned associate degrees (approximately 42%) and were staff technologists (approximately 61%).

The Radiologic Technologists' Perceptions of Professional Values Scale provided data regarding participants' perceptions of the importance of professional values and demographic data. Overall, all seven professional values scored above a 3.0, indicating that radiologic technologists perceive professional values as important. A one-way ANOVA on the RTPPVS means of all demographic groups showed no significant differences between groups.

## **CHAPTER 4**

### **RESULTS**

In many healthcare disciplines, professionalism is demonstrated by the extent to which members of a profession are motivated by shared professional values that uniquely define the profession (Guenther et al., 2014; Nixon, 2001; Schlabach, 2017). These professional values define expected behaviors for the profession (Guenther, et al., 2014; McGinnis et al., 2016; Schlabach, 2017). Unfortunately, radiologic technology is struggling to be recognized as a profession and has not identified and explicitly articulated professional values (Nortje' & Hoffman, 2017; Sim & Radloff, 2008). Currently, the profession is guided by two documents: the ASRT Practice Standards and the ARRT Standards of Ethics. However, these two documents do not clearly identify professional values.

The radiologic technologists' perception of the importance of professional values, if radiologic technologists think it is important to articulate professional values, and perceptual differences of professional values between radiologic technologists based on demographic characteristics were examined in this study. During the review of the literature, research indicating the perception of professional values of practicing radiologic technologists was not identified. The purpose of this study was to determine if the profession perceives the importance of identifying and articulating professional values. Participants were asked to identify the importance of sample indicators and values-based behaviors for a particular professional value. Frequency and percentages of

responses were calculated and compared for these professional value sets. The results of research hypotheses were examined by statistical analysis.

The Radiologic Technologists' Perceptions of Professional Values Scale (*RTPPVS*) was used to determine if professional values differed between participants based on age, gender, state residency, years of experience, level of education, and job position. The RTPPVS is a Likert response survey consisting of 61 items. Participants reported perceptions of the importance of radiologic science professional values and sample indicators on a scale of five responses ranging from "not important" to "most important". Results were analyzed to determine these perceptions.

### **Sample Characteristics**

Three thousand five hundred members randomly selected from the ASRT database received an invitation to participate in this study. Since diagnostic radiography is the foundation of radiologic technology practice, invitations were restricted to those radiologic technologists practicing primarily in diagnostic radiography and living in the United States. Radiologic technologists practicing in other areas, such as computed tomography, mammography, ultrasound, magnetic resonance imaging, or radiation therapy were not invited to participate in the study because some of the modalities within radiologic technology practice do not require individuals to be a radiologic technologist before learning the skills of that modality, such as ultrasound and magnetic resonance imaging. Therefore, to ensure only radiologic technologists were surveyed, the other areas were not invited to participate.

Of the 3,500 invitations extended, 716 were completed for a 20.46% response rate. Seven hundred and eleven (85%) of the returned surveys were used to analyze the

data. Demographic data indicated that the participants were predominantly female (approximately 75%) with a mean age of 49 and with a majority (approximately 45%) indicating over 21 years of experience. The majority of respondents have earned an associate degree (approximately 42%) and identified as a staff technologist (approximately 61%).

Females comprised 74.96% ( $N = 533$ ) of the respondents, while males accounted 25.04% ( $N = 178$ ) responses; 33 participants did not respond to this question. Table 5 lists the frequency and percent of respondents' gender.

Table 5  
*Gender of Survey Respondents*

| Gender of Respondents | Frequency | Percent |
|-----------------------|-----------|---------|
| Female                | 533       | 74.96   |
| Male                  | 178       | 25.04   |
| No response           | 33        |         |

Participants age ranged from 21 to 85 years of age ( $N = 709$ ), with a median age of 49; 6 respondents skipped this question.

The five states of residency most frequently cited were California, North Carolina, Ohio, New York, and Massachusetts. Table 6 shows the number of responses and the percent of responses for the top five states. Forty of the respondents lived in California ( $N = 5.63\%$ ), 38 resided in North Carolina ( $N = 5.34\%$ ), 35 in Ohio and New York ( $N = 4.92\%$ ), and 32 in Massachusetts ( $N = 4.50\%$ ). Five respondents failed to answer this question. Of the 50 states in the United States and the District of Columbia, only the states of Alaska and Delaware did not have a respondent.

Table 6  
*Residence of Survey Respondents*

| State of Respondents | Number | Percent |
|----------------------|--------|---------|
| California           | 40     | 5.63    |
| North Carolina       | 38     | 5.34    |
| Ohio and New York    | 35     | 4.92    |
| Massachusetts        | 32     | 4.50    |
| No response          | 5      | 0.0     |
| Total                | 544    |         |

Each reported years of experience as a radiologic technologist (Table 7). An overwhelming majority of the respondents, nearly half, 45.10% ( $N = 322$ ) reported over 21 years of experience. The second highest category for years of experience was the 11-15 years of experience, with 13.45% ( $N = 96$ ). Two respondents failed to answer this question.

Table 7  
*Years of Experience as a Radiologic Technologist*

| Years of Experience | Number | Percent |
|---------------------|--------|---------|
| 0-2                 | 85     | 11.90   |
| 3-5                 | 69     | 9.66    |
| 6-10                | 84     | 11.76   |
| 11-15               | 96     | 13.45   |
| 16-20               | 58     | 8.12    |
| 21 or more          | 322    | 45.10   |
| No response         | 2      | 0.002   |
| Total               | 716    |         |

Educational level was divided into five variables: certificate, associate degree, bachelor degree, master degree, or doctorate degree and varied among respondents. The majority of the respondents, 42.23% ( $N = 299$ ) held an associate degree, the profession's current entry-level requirement. Two hundred nineteen respondents ( $N = 30.93\%$ ) had obtained a bachelor's degree. The certificate degree, previously the education level

requirement, was reported by 15.82% ( $N = 112$ ) of respondents. Lastly, 9.46% ( $N = 67$ ) of respondents possessed a master's degree and 1.55% ( $N = 11$ ) a doctorate degree. Table 8 displays the number and percent of responses related to education level. Eight respondents failed to answer this question.

Table 8  
*Education level*

| Education level | <i>Number</i> | Percent |
|-----------------|---------------|---------|
| Certificate     | 112           | 15.82   |
| Associate       | 299           | 42.23   |
| Bachelor        | 219           | 30.93   |
| Masters'        | 67            | 9.46    |
| Doctorate       | 11            | 1.55    |
| No response     | 8             | 0.01    |
| Total           | 708           |         |

When asked to identify current job title, 80 respondents skipped this question while 636 indicated a response. Table 9 shows the number and percent of responses related to current job title. The majority of the respondents, 60.85% ( $N = 387$ ), identified as staff technologists, while 17.45% ( $N = 111$ ) reported being a senior or lead technologist. Forty-nine respondents ( $N = 7.70\%$ ) occupied a supervisor or management role. Twenty-two respondents ( $N = 3.46\%$ ) identified as an instructor or faculty member and 20 ( $N = 3.14\%$ ) identify themselves as a program director. Fifteen respondents ( $N = 2.36\%$ ) were administrators and 17 ( $N = 2.67\%$ ) corporate representatives, which was defined as sales. Lastly, 2.36% ( $N = 15$ ) respondents identified as temporary staff.

Table 9  
*Current job title*

| Job title                | <i>Number</i> | <i>Percent</i> |
|--------------------------|---------------|----------------|
| Staff technologist       | 387           | 60.85          |
| Senior/lead technologist | 111           | 17.45          |
| Supervisor/management    | 49            | 7.70           |

|                          |     |      |
|--------------------------|-----|------|
| Instructor/faculty       | 22  | 3.46 |
| Program director         | 20  | 3.14 |
| Administrator            | 15  | 2.36 |
| Corporate representative | 17  | 2.67 |
| Locum tenens             | 15  | 2.36 |
| No response              | 80  | 0.01 |
| Totals                   | 716 |      |

## Results

Three major research questions were addressed in this study relevant to perceptions of professional values by practicing RTs. Research questions answered by this study were as follows:

- (a) Which professional values are perceived as most important to practicing radiologic technologists as measured by a mean score of 3.0 or greater?  
Research Hypothesis: If a professional value is scored as 3.0 or greater, then it will be perceived as important to practicing radiologic technologists.
- (b) Do ASRT members perceive it important for the radiologic technology profession to explicitly articulate professional values as measured by a score of 4.0 or greater?  
Research Hypothesis: If a mean score of 4.0 or higher is achieved, then it will demonstrate the importance of the profession of radiologic technology explicitly articulating professional values.
- (c) Are there significant differences in the perceived level of importance of professional values between radiologic technologists' according to demographic characteristics?  
Statistical Hypothesis: There is no significant difference between perceived level of importance of professional values and the demographic characteristics of level of education, years of experience, job position, age and gender.

### Research Question 1.

Which professional values are perceived as most important to practicing radiologic technologists as measured by a mean score of 3.0 or greater? Research Hypothesis: If a professional value is scored as 3.0 or greater, then it will be perceived as important to practicing radiologic technologists. The dependent variable is the factor total

score. Respondents were presented with a characteristic and sample indicator, or values-based behaviors, for that characteristic. For each of the following sample indicators listed, the respondent selected a response indicating their perception of the importance of the item. The responses were in a Likert scale as follows; 1 = not important, 2 = somewhat important, 3 = important, 4 = very important, 5 = most important.

***Accountability.***

Accountability is active acceptance of the responsibility for the diverse roles, obligations, and actions of the radiologic technologist, including self-regulation and other behaviors that positively influence patient outcomes, the profession and the health needs of society (American Physical Therapy Association [APTA], 2013). The sample indicators for accountability included: (a) responding to patient's needs; (b) supporting colleagues and associates in providing quality patient care; (c) acknowledging and accepting consequences of his/her actions; (d) assuming responsibility for professional decisions; (e) adhering to code of ethics, standards of practice, and policies/procedures that govern the conduct of professional activities; (f) communicating accurately to others (payers, patients, other health care providers) about professional actions; (g) seeking continuous improvement in quality of care; (h) maintaining membership in ASRT and other organizations; and (i) educating students in a manner that facilitates the pursuit of learning. Table 10 shows the number of participants, means and standard deviations of the respondent's perception of importance of the sample indicators for accountability. All nine indicators scored above a 3.0, indicating that the radiologic technologist perceived accountability as an important professional value.

Table 10  
*Indicators for Accountability*

| Sample Indicators for Accountability                                       | <i>Number</i> | <i>Mean</i> | <i>Standard Deviation</i> |
|--|---------------|-------------|---------------------------|
| 1. responding to patient's needs   | 608           | 4.59        | 0.53                      |
| 2. supporting colleagues and associates in providing quality patient care  | 608           | 4.36        | 0.58                      |
| 3. acknowledging and accepting consequences of his/her actions             | 608           | 4.40        | 0.58                      |
| 4. assuming responsibility for professional decisions                      | 608           | 4.37        | 0.62                      |
| 5. adhering policies/procedures that govern the conduct of the profession  | 608           | 4.58        | 0.57                      |
| 6. communicating accurately to others                                      | 608           | 4.42        | 0.62                      |
| 7. seeking continuous improvement in quality of care                       | 606           | 4.29        | 0.68                      |
| 8. maintaining membership in ASRT and other organizations                  | 604           | 3.48        | 0.98                      |
| 9. educating students in a manner that facilitates the pursuit of learning | 604           | 4.14        | 0.76                      |
| Total for All Questions  | 604           | 4.29        | 0.46                      |

In summary, **the results for the research hypothesis, professional values scored as 3.0 or greater will be perceived as important to practicing radiologic technologists was supported.** An overall mean score of 4.29 was achieved and the means ranged from 3.48 to 4.59. The highest scoring indicator was “responding to patients’ needs” with a mean of 4.59. “Adhering to code of ethics, standards of practice,

and policies/procedures that govern the conduct of professional activities” scored a close second with a mean of 4.58. The third highest scoring indicator was “communicating accurately to others (payers, patients, other health care providers) about professional actions”. “Maintaining membership in ASRT and other organizations” scored the lowest for this core value with a mean score of 3.48; above the established minimum, but somewhat concerning. Sim and Radloff (2008) stated membership in professional organizations is an important attribute for a profession because the professional organization represents the members of the organization. Since radiologic technology is struggling to be recognized as a profession, a professional organization, such as the ASRT, can represent the voice of radiologic technologists.

### *Altruism.*

Altruism is the primary regard for or devotion to the interest of patients, thus assuming the fiduciary responsibility of placing the needs of the patient ahead of the radiologic technologists’ self-interest (APTA, 2013). The sample indicators for altruism include: (a) acting in the best interest of the patient; (b) providing services to humanity with full respect for the dignity of mankind; (c) providing patient care that goes beyond expected standards of practice; and (d) completing patient care and professional responsibility prior to personal needs. Table 11 shows the number of participants, means and standard deviations of the respondent’s perception of importance of the sample indicators for altruism. All four indicators scored above a 3.0, indicating that the radiologic technologist perceived altruism is an important professional value.

Table 11  
*Indicators for Altruism*

| Sample Indicators for Altruism   | <i>Number</i> | <i>Mean</i> | <i>Standard Deviation</i> |
|--|---------------|-------------|---------------------------|
| 1. acting in the best interest of the patient                                      | 606           | 4.68        | 0.57                      |
| 2. providing services to humanity with full respect for the dignity of mankind     | 606           | 4.49        | 0.63                      |
| 3. providing patient care that goes beyond expected standards of practice          | 606           | 4.42        | 0.67                      |
| 4. completing patient care and professional responsibility prior to personal needs | 604           | 4.28        | 0.80                      |
| Total for All Questions  | 604           | 4.47        | 0.53                      |

In summary, **the results for the research hypothesis, professional values scored as 3.0 or greater will be perceived as important to practicing radiologic technologists was supported.** All four of the indicators in this section scored very high means, ranging from 4.28 to 4.68. The overall mean score for altruism was 4.47. “Acting in the best interest of the patient” scored the highest with a mean of 4.68. The second highest indicator was “providing services to humanity with full respect for the dignity of mankind” with a mean of 4.49. The indicator that scored the next highest was “providing patient care that goes beyond expected standards of practice”, and “completing patient care and professional responsibility prior to personal needs” scored the lowest with a mean score of 4.28, which is still above the threshold of 3.0. Altruism has been identified as an important attribute of a profession (Anderson & Irwin, 2013; Guenther et al., 2014;

Sim & Radloff, 2008). It is the professional's responsibility to place the well-being and the interest of the patient before that of the healthcare practitioner.

*Compassion/caring.*

Compassion is the desire to identify with or sense something of another's experience; a precursor of caring (APTA, 2013). Caring is the concern, empathy, and consideration for the needs and values of others. Sample indicators for compassion and caring include: (a) understanding the socio-cultural, economic, and psychological influences on the individual's life in their environment; (b) understanding an individual's perspective; (c) being an advocate for patient's' needs; (d) communicating effectively, both verbally and non-verbally, with others taking into consideration individual differences in learning styles, language, and cognitive abilities, etc.; (e) recognizing and refraining from acting on one's social, cultural, gender and sexual biases; (f) embracing the patient's emotional and psychological aspects of care; (g) attending to the patient's personal needs and comforts; and (h) demonstrating respect for others and considers others as unique and of value. Table 12 shows the number of participants, means, and standard deviations of the respondent's perception of importance of the sample indicators for compassion/caring. All eight indicators scored above a 3.0, indicating that the radiologic technologist perceived compassion/caring as an important professional value.

Table 12  
*Indicators for Compassion/caring*

| Sample Indicators for<br>Compassion/caring  | <i>Number</i> | <i>Means</i> | <i>Standard<br/>Deviation</i> |
|---|---------------|--------------|-------------------------------|
| 1. understanding the socio-cultural, economic, and psychological influences on the individual's life in their environment | 608           | 3.86         | 0.82                          |

|  |     |      |      |
|--|-----|------|------|
| 2. understanding an individual's perspective   | 608 | 4.12 | 0.73 |
| 3. being an advocate for patient's needs   | 607 | 4.33 | 0.76 |
| 4. communicating effectively, both verbally and non-verbally, with others taking into consideration individual differences in learning styles, language, and cognitive abilities, etc. | 608 | 4.33 | 0.67 |
| 5. recognizing and refraining from acting on one's social, cultural, gender and sexual biases  | 606 | 4.32 | 0.70 |
| 6. embracing the patient's emotional and psychological aspects of care   | 608 | 4.19 | 0.72 |
| 7. attending to the patient's personal needs and comforts  | 608 | 4.24 | 0.78 |
| 8. demonstrating respect for others and considers others as unique and of value  | 607 | 4.42 | 0.66 |
| Total for All Questions  | 607 | 4.23 | 0.56 |

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In summary, **the results for the research hypothesis, professional values scored as 3.0 or greater will be perceived as important to practicing radiologic technologists was supported.** The overall mean for this professional value was 4.23. Of the 8 indicators for compassion/caring, seven scored above a mean of 4.10, with a range from 3.86 – 4.42. The highest scoring indicator was “demonstrating respect for others and considers others as unique and of value” with a mean of 4.42. Two indicators tied for the second highest mean, “being an advocate for patient's' needs” and “communicating effectively, both verbally and non-verbally, with others taking into consideration

individual differences in learning styles, language, and cognitive abilities, etc.”, both scored a mean of 4.33. “Recognizing and refraining from acting on one’s social, cultural, gender and sexual biases” scored a close third highest with a mean score of 4.32. The lowest scoring indicator was “understanding the socio-cultural, economic, and psychological influences on the individual’s life in their environment” with a mean score of 3.86; however, this score is still above the threshold of 3.0 for perceived importance.

### *Excellence.*

For a radiologic technologist to demonstrate excellence in imaging practice, one must consistently use current knowledge and theory while understanding personal limits, integrate judgment and the patient perspective, challenge mediocrity, and work towards development of new knowledge (APTA, 2013). The sample indicators for excellence include: (a) demonstrating investment in the profession of radiography; (b) internalizing the importance of using multiple sources of evidence to support professional practice decisions; (c) participating in integrative and collaborative practice to promote high quality health and educational outcomes; (d) assessing situations, exercising care, discretion and judgment; (e) demonstrating high levels of knowledge and skill in all aspects of the profession; (f) practicing technology founded upon theoretical knowledge and concepts; (g) using equipment consistent with the purposes for which it was designed; (h) pursuing new evidence to expand knowledge; (i) Engaging in acquisition of new knowledge throughout one’s professional career; (j) Sharing one’s knowledge with colleagues; and (k) contributing to the development and shaping of excellence in all professional roles. Table 13 shows the number of participants, means and standard deviations of the respondent’s perception of importance of the sample indicators for

excellence. All 11 indicators scored above a 3.0, indicating that the radiologic technologist perceived that excellence is an important professional value.

Table 13  
*Indicators for Excellence*

| Sample Indicators for Excellence   | <i>Number</i> | <i>Mean</i> | <i>Standard Deviation</i> |
|--|---------------|-------------|---------------------------|
| 1. demonstrating investment in the profession of radiography   | 608           | 3.97        | 0.82                      |
| 2. internalizing the importance of using multiple sources of evidence to support professional practice decisions   | 604           | 3.83        | 0.83                      |
| 3. participating in integrative and collaborative practice to promote high quality health and educational outcomes | 607           | 3.99        | 0.83                      |
| 4. assessing situations, exercising care, discretion and judgment  | 608           | 4.42        | 0.64                      |
| 5. demonstrating high levels of knowledge and skill in all aspects of the profession                               | 607           | 4.40        | 0.67                      |
| 6. practicing technology founded upon theoretical knowledge and concepts   | 607           | 3.95        | 0.86                      |
| 7. using equipment consistent with the purposes for which it was designed  | 603           | 4.35        | 0.71                      |
| 8. pursuing new evidence to expand knowledge   | 606           | 4.02        | 0.82                      |
| 9. engaging in acquisition of knowledge throughout one's professional career                                       | 606           | 4.14        | 0.77                      |
| 10. sharing knowledge with colleagues  | 606           | 4.04        | 0.83                      |
| 11. contributing to the development and shaping of excellence in all professional roles                            | 605           | 4.03        | 0.84                      |
| Total for All Questions  | 603           | 4.29        | 0.46                      |

In summary, **the results for the research hypothesis, professional values scored as 3.0 or greater will be perceived as important to practicing radiologic technologists was supported.** The overall mean score for all of the indicators of excellence was 4.29. All 11 of the indicators in this section scored high means, ranging from 3.83 to 4.42. The highest scoring indicator was “assessing situations, exercising care, discretion and judgment” with a mean score of 4.42. “Demonstrating high levels of knowledge and skill in all aspects of the profession” scored the second highest with a mean of 4.40. The third highest scoring indicator for the core value of excellence was “using equipment consistent with the purposes for which it was designed”, with a mean score of 4.35. The lowest scoring indicator for excellence was “internalizing the importance of using multiple sources of evidence to support professional practice decisions” with a mean score of 3.83. Again, even though this indicator scored the lowest, it still scored above a 3.0, indicating that this indicator is perceived as important.

### ***Integrity.***

Integrity is steadfast adherence to high ethical principles or professional standards; truthfulness, fairness, doing what you say you will do, and “speaking forth” about why you do what you do (APTA, 2013). The sample indicators of integrity include: (a) abiding by the rules, regulations, and laws applicable to the profession; (b) adhering to the highest standards of the profession (scope of practice, ethics, etc.); (c) articulating and internalizing stated ideals and professional values; (d) practicing ethical conduct appropriate to the profession; (e) being trustworthy; (f) taking responsibility to be an integral part in the continuing management of patients; (g) knowing one’s limitations and

acting accordingly; (h) confronting harassment and bias among ourselves and others; (i) recognizing the limits of one's expertise and seeking assistance appropriately; (j) choosing employment situations that are congruent with practice values and professional ethical standards; and (k) acting on the basis of professional values. Table 14 shows the number of participants, means and standard deviations of respondent's perception of importance of the sample indicators for integrity. All 11 indicators scored above a 3.0, indicating that the radiologic technologist perceived integrity is an important professional value.

Table 14  
*Indicators for Integrity*

| Sample Indicators for Integrity  | <i>Number</i> | <i>Mean</i> | <i>Standard Deviation</i> |
|--|---------------|-------------|---------------------------|
| 1. abiding by the rules, regulations, and laws applicable to the profession              | 608           | 4.53        | 0.63                      |
| 2. adhering to the highest standards of the profession                                   | 608           | 4.61        | 0.59                      |
| 3. articulating and internalizing stated ideals and professional values                  | 607           | 4.15        | 0.77                      |
| 4. practicing ethical conduct appropriate to the profession                              | 608           | 4.60        | 0.59                      |
| 5. being trustworthy   | 609           | 4.68        | 0.55                      |
| 6. taking responsibility to be an integral part in the continuing management of patients | 608           | 4.34        | 0.70                      |
| 7. knowing one's limitations and acting accordingly                                      | 608           | 4.35        | 0.66                      |
| 8. confronting harassment and bias among ourselves and others                            | 606           | 4.11        | 0.78                      |

|   |     |      |      |
|---|-----|------|------|
| 9. recognizing the limits of one's expertise and seeking assistance appropriately                             | 608 | 4.38 | 0.64 |
| 10. choosing employment situations that are congruent with practice values and professional ethical standards | 607 | 4.20 | 0.76 |
| 11. acting on the basis of professional values  | 604 | 4.36 | 0.68 |
| Total for All Questions   | 604 | 4.39 | 4.45 |

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In summary, **the results for the research hypothesis, professional values scored as 3.0 or greater will be perceived as important to practicing radiologic technologists was supported.** These 11 indicators for integrity ranged from 4.11 to 4.68 with an overall mean score of 4.39. The highest scoring indicator was “being trustworthy” with a mean score of 4.68. The second highest indicator was “adhering to the highest standards of the profession (scope of practice, ethics, etc.)” with a mean score of 4.61. The third highest scoring indicator was “practicing ethical conduct appropriate to the profession” with a mean score of 4.60. The lowest scoring indicator was “confronting harassment and bias among ourselves and others” with a mean score of 4.11. All 11 indicators scored above a 4.0, indicating that the radiologic technologist reported integrity is an important professional value.

***Professional duty.***

Professional duty is the commitment to meeting one's obligations to provide quality imaging services to individual patients, to serve the profession and to positively influence the health of society (APTA, 2013). The sample indicators of professional duty include: (a) demonstrating beneficence by providing “quality patient care”; (b) using

techniques appropriately to minimize radiation exposure to the patient, self and other members of the healthcare team; (c) preserving the safety, security and confidentiality of individuals in all professional contexts; (d) involved in professional activities beyond the practice setting; (e) promoting the profession of radiography; (f) mentoring others to realize their potential; and (g) obtaining information for the physician to aid in the diagnosis and treatment of the patient. Table 15 shows the number of participants, means and standard deviations of respondent's perception of importance of the sample indicators for professional duty. All seven indicators scored above a 3.0, indicating that the radiologic technologist perceived professional duty is an important professional value.

Table 15  
*Indicators for Professional duty*

| Sample Indicators for Professional Duty  | <i>Number</i> | <i>Mean</i> | <i>Standard Deviation</i> |
|--|---------------|-------------|---------------------------|
| 1. demonstrating beneficence by providing "quality patient care"   | 607           | 4.49        | 0.60                      |
| 2. using techniques appropriately to minimize radiation exposure to the patient, self and other members of the healthcare team | 606           | 4.69        | 0.53                      |
| 3. preserving the safety, security and confidentiality of individuals in all professional contexts                             | 607           | 4.66        | 0.55                      |
| 4. involved in professional activities beyond the practice setting   | 605           | 3.33        | 1.07                      |
| 5. promoting the profession of radiography   | 605           | 3.61        | 1.04                      |
| 6. mentoring others to realize their potential   | 607           | 3.87        | 0.92                      |

|   |     |      |      |
|---|-----|------|------|
| 7. obtaining information for the physician to aid in the diagnosis and treatment of the patient | 604 | 4.35 | 0.80 |
| Total for All Questions   | 604 | 4.14 | 0.57 |

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In summary, **the results for the research hypothesis, professional values scored as 3.0 or greater will be perceived as important to practicing radiologic technologists was supported.** The seven indicators for the core value of professional duty ranged from 3.33 to 4.69 with an overall mean score of 4.14. The highest scoring indicator was “using techniques appropriately to minimize radiation exposure to the patient, self and other members of the healthcare team” with a mean score of 4.69, the highest mean on the entire survey. The second highest scoring indicator of professional duty was “preserving the safety, security and confidentiality of individuals in all professional contexts” with a mean score of 4.66. The third highest scoring indicator was “demonstrating beneficence by providing ‘quality patient care’” with a mean score of 4.49. The lowest scoring indicator for professional duty was “being involved in professional activities beyond the practice setting”. All seven indicators scored above a 3.0, indicating that radiologic technologists perceived professional duty is an important professional value.

#### ***Social responsibility.***

Social responsibility is the promotion of a mutual trust between the profession and the larger public that necessitates responding to societal needs for health and wellness. The sample indicators for social responsibility include: (a) advocating for the health and wellness needs of society including access to health care and radiography services; (b)

promoting cultural competence within the profession and the larger public; (c) promoting social policy that effect function, health, and wellness needs of patients; (d) ensuring that existing social policy is in the best interest of the patient; (e) advocating for changes in laws, regulations, standards, and guidelines that affect the radiography profession; (f) promoting community volunteerism; (g) participating in political activism; (h) participating in achievement of societal health goals; (i) understanding of current community wide, nationwide and worldwide issues and how they impact society's health and well-being and the delivery of radiology services; (j) providing leadership in the community; and (k) participating in collaborative relationships with other health practitioners and the public at large. Table 16 shows the number of participants, means and standard deviations of respondent's perception of importance of the sample indicators for social responsibility. Of the 11 indicators for social responsibility, 10 items scored above a 3.0, indicating that the radiologic technologist perceived social responsibility is an important professional value.

Table 16  
*Indicators for Social responsibility*

| Sample Indicators for Social responsibility   | <i>Number</i> | <i>Mean</i> | <i>Standard Deviation</i> |
|---|---------------|-------------|---------------------------|
| 1. advocating for the health and wellness needs of society including access to health care and radiography services | 607           | 3.74        | 0.96                      |
| 2. promoting cultural competence within the profession and the larger public  | 606           | 3.76        | 0.94                      |
| 3. promoting social policy that effect function, health, and wellness needs of patients                             | 606           | 3.73        | 0.98                      |
| 4. ensuring that existing social policy is in the best interest of the patient                                      | 606           | 3.82        | 0.95                      |

|  |     |      |      |
|--|-----|------|------|
| 5. advocating for changes in laws, regulations, standards, and guidelines that affect the radiography profession   | 606 | 3.76 | 0.98 |
| 6. promoting community volunteerism  | 608 | 3.10 | 1.08 |
| 7. participating in political activism   | 605 | 2.51 | 1.16 |
| 8. participating in achievement of societal health goals   | 603 | 3.14 | 1.09 |
| 9. understanding of current community wide, nationwide and worldwide issues and how they impact society's health and well-being and the delivery of radiology services | 605 | 3.35 | 1.05 |
| 10. providing leadership in the community  | 607 | 3.09 | 1.13 |
| 11. participating in collaborative relationships with other health practitioners and the public at large   | 605 | 3.38 | 1.06 |
| Total for All Questions  | 608 | 3.40 | 0.85 |

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In summary, **the results for the research hypothesis, professional values scored as 3.0 or greater will be perceived as important to practicing radiologic technologists was supported.** This data reveals the 11 indicators for the core value of social responsibility ranged from 2.51 to 3.82 with an overall mean of 3.40. The highest scoring indicator was “ensuring that existing social policy is in the best interest of the patient” with a mean score of 3.82. The second highest scoring indicator was a tie between “promoting cultural competence within the profession and the larger public” and “advocating for changes in laws, regulations, standards, and guidelines that affect the radiography profession” with a mean score for 3.76. The third highest scoring indicator

was “advocating for the health and wellness needs of society including access to health care and radiography services” with a mean score of 3.71. The lowest scoring indicator was “participating in political activism” with a mean score of 2.51. This item was the lowest scoring item in the survey. Overall, 10 of the 11 indicators for the professional core value of social responsibility scored a mean above 3.0. Therefore, all indicators, except participating in political activism are perceived as important to the practicing radiologic technologist.

### **Overall scores.**

In summary, the results for the research hypothesis, professional values scored as 3.0 or greater will be perceived as important to practicing radiologic technologists was supported. All seven professional values scored above a 3.0, indicating that radiologic technologists perceive professional values as important. Table 17 shows the number of participants, means and standard deviations of respondents’ perception of importance of the total scores for each of the professional values.

Table 17  
*Total scores for Each Professional Value*

| Professional Value    | Number | Mean | Standard Deviation |
|-----------------------|--------|------|--------------------|
| Accountability        | 608    | 4.29 | 0.46               |
| Altruism              | 607    | 4.47 | 0.53               |
| Compassion/caring     | 608    | 4.23 | 0.56               |
| Excellence            | 608    | 4.10 | 0.60               |
| Integrity             | 609    | 4.39 | 0.50               |
| Professional duty     | 607    | 4.14 | 0.57               |
| Social responsibility | 608    | 3.40 | 0.85               |

Altruism scored the highest of the core values, with a mean score of 4.47.

Integrity scored the second highest with a mean score of 4.39. The third highest scoring

professional value was accountability with a mean score of 4.29. Compassion/caring scored the fourth highest with a mean score of 4.23. Professional duty ranks fifth with a mean score of 4.14. Excellence was ranked sixth with a mean score of 4.10. The only professional value to score an overall mean below 4.0 was social responsibility with a mean score of 3.40. The findings are similar to the findings of Guenther et al. (2014). Physical therapists, utilizing the Professionalism in Physical Therapy: Core Values Self-Assessment Tool, scored social responsibility as the least important professional core value. Overall, the seven professional core values scored a mean above 3.0. Therefore, all professional core values, are perceived as important to the practicing radiologic technologist.

### **Research Question 2.**

Do ASRT members perceive it important for the radiologic technology profession to explicitly articulate professional values as measured by a score of 4.0 or greater?

Research Hypothesis: If a mean score of 4.0 or higher is achieved, then it will demonstrate the importance of the profession of radiologic technology explicitly articulating professional values. The dependent variable is the factor total score.

Respondents answered the question using a 5-point Likert scale ranging from 5 (most important) to 1 (not important). The mean score for this item was 4.15. Table 18 displays the frequency and percent of respondent's perception of importance of articulating professional values. The majority of respondents, 46.29% ( $N = 281$ ), perceive it as very important to articulate professional values for the profession of radiologic technology. Two hundred twenty-four ( $N = 36.90\%$ ) respondents, feel it is most important to articulate professional values. Eighty ( $N = 13.18\%$ ) respondents feel it is important to

articulate professional values. Lastly, 19 ( $N = 3.13\%$ ) respondents feel it is somewhat important and three ( $N = 0.49\%$ ) respondents feel it is not important to articulate professional values.

Table 18  
*Importance of articulating professional values*

| Importance of articulation <sup>a</sup> | Number | Percent |
|---|--------|---------|
| Not important                           | 3      | 0.49    |
| Somewhat important                      | 19     | 3.13    |
| Important                               | 80     | 13.18   |
| Very important                          | 281    | 46.29   |
| Most important                          | 224    | 36.90   |

<sup>a</sup> $N = 607$

In summary, **the results for the research hypothesis of a mean score of 4.0 or higher will demonstrate the importance of the profession of radiologic technology explicitly articulating professional values was supported.** The data indicated that practicing radiologic technologists perceive it as important for professional values to be articulated for the profession.

### **Research Question 3.**

Are there significant differences in the perceived level of importance of professional values between radiologic technologists' according to demographic characteristics? The statistical hypothesis is that there is no significant difference between perceived level of importance of professional values and the demographic characteristics of level of education, years of experience, job position, age and gender. The demographic characteristics that were evaluated included gender, age, residing state, years of experience as a radiologic technologist, education level, and job title.

## ANOVA Results

A one-way ANOVA was computed using the mean total scores for each demographic characteristic. The effect of demographic variables regarding the perception of importance of professional values was examined. The means for each of the groups (shown in subsequent tables) indicated that the influence of the independent variable on the dependent variable was in the direction predicted. **The between groups ANOVA revealed that the statistical hypothesis was supported; there is no significant difference between perceived level of importance of professional values and the demographic characteristics of gender, age, years of experience, level of education, and job title.**

### Gender.

To assess the influence of gender on the perceived importance of professional values, two tests were performed. First, the relationship between the two measures of gender was examined. A one-way ANOVA indicated no significant difference in perception of importance of professional values across the two variables ( $F = 0.22$ ,  $df = 1/604$ ,  $p < 0.1$ ). A higher level of perceived importance was reported in females ( $M = 250.01$ ,  $SD = 33.042$ ), followed by males ( $M = 248.5$ ,  $SD = 33.82$ ). With an  $N$  of 606, the resulting  $F$  value for differences between the demographic characteristic of gender was 0.22. The resulting  $p$  was 0.6412. **A  $p$  of 0.6412 indicated no significant difference between genders.** Table 19 shows the source of variance,  $F$  ( $df_B$ ,  $df_W$ ), sum of squares, degrees of freedom, observed  $F$  values ( $F$ ), and significance level ( $p$ ).

Table 19  
Results of one-way ANOVA for gender

| Source of Variance | Sum of Squares | Degrees of Freedom | <i>F</i> | <i>p</i> |
|--------------------|----------------|--------------------|----------|----------|
| Between Groups     | 667271         | 604                | 0.22     | 0.6412   |
| Within Groups      | 240            | 1                  |          |          |
| Total              | 667511         | 605                |          |          |

### Age.

To assess the influence of age on the perceived importance of professional values, two tests were performed. First, the relationship between the six measures of age was examined. The measures grouped age in ten year intervals; 20-29, 30-39, 40-49, 50-59, 60-69, 70 and above. A one-way ANOVA indicated no significant difference in perception of importance of professional values across the six variables ( $F = 1.34$ ,  $df = 5/605$ ,  $p < 0.1$ ). A higher level of perceived importance was reported in the age 70 and above group ( $M = 259.23$ ,  $SD = 25.45$ ), followed by the 60-69 age group ( $M = 253.5$ ,  $SD = 32.91$ ). With an  $N$  of 606, the resulting  $F$  value for differences between the demographic characteristic of age was 1.34. The resulting  $p$  was 0.2452. A  $p$  of 0.2452 indicated **no significant difference among age groups**. Table 20 shows the source of variance,  $F$  ( $df_B$ ,  $df_W$ ), sum of squares, degrees of freedom, observed  $F$  values ( $F$ ), and significance level ( $p$ ).

Table 20  
Results of One-way ANOVA for Age

| Source of Variance | Sum of Squares | Degrees of Freedom | <i>F</i> | <i>p</i> |
|--------------------|----------------|--------------------|----------|----------|
| Between Groups     | 659196         | 600                | 1.34     | 0.2452   |

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|               |        |     |
|---------------|--------|-----|
| Within Groups | 7366   | 5   |
| Total         | 666563 | 605 |

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### **Years of experience.**

To assess the influence of years of experience on the perceived importance of professional values, two tests were performed. First, the relationship between the six measures of years of experience was examined and measured by grouping. Years of experience in varying intervals; 0-2 years, 3-5 years, 6-10 years, 11-15 years, 16-20 years, and 21 or more years. A one-way ANOVA indicated no significant difference in perception of importance of professional values across the six variables ( $F = 0.83$ ,  $df = 5/608$ ,  $p < 0.1$ ). A higher level of perceived importance was reported in practicing radiologic technologists with three to five years of experience ( $M = 253.96$ ,  $SD = 38.18$ ), followed by practicing radiologic technologists with 21 years or more of experience ( $M = 251.3$ ,  $SD = 33.87$ ). With an  $N$  of 609, the resulting  $F$  value for differences between the demographic characteristic of years of experience was 0.83. The resulting  $p$  was 0.5311, which indicated **no significant difference among years of experience**. Table 21 shows the source of variance,  $F$  ( $df_B$ ,  $df_W$ ), sum of squares, degrees of freedom, observed  $F$  values ( $F$ ), and significance level ( $p$ ).

Table 21  
*Results of One-way ANOVA for Years of Experience*

| Source of Variance | Sum of Squares | Degrees of Freedom | <i>F</i> | <i>p</i> |
|--------------------|----------------|--------------------|----------|----------|
| Between Groups     | 665383         | 603                | 0.83     | 0.5311   |
| Within Groups      | 4559           | 5                  |          |          |
| Total              | 669942         | 608                |          |          |

### **Level of education.**

To assess the influence of level of education on the perceived importance of professional values, two tests were performed. First, the relationship between the five measures of education was examined. The measures were certificate, associate degree, bachelor degree, master's degree and doctorate. A one-way ANOVA indicated no significant difference in perception of importance of professional values across the five variables ( $F = 1.46$ ,  $df = 4/604$ ,  $p < 0.1$ ). A higher level of perceived importance was reported in radiologic technologists with doctoral degrees ( $M = 268.39$ ,  $SD = 23.52$ ), followed by radiologic technologists with a masters' degree ( $M = 253.79$ ,  $SD = 29.82$ ). With an  $N$  of 604, the resulting  $F$  value for differences between the demographic characteristic of educational level was 1.46. The resulting  $p$  was 0.2120, which indicated **no significant difference among varying education levels**. Table 22 shows the source of variance,  $F$  ( $df_B$ ,  $df_W$ ), sum of squares, degrees of freedom, observed  $F$  values ( $F$ ), and significance level ( $p$ ).

Table 22  
*Results of One-way ANOVA for Level of Education*

| Source of Variance | Sum of Squares | Degrees of Freedom | <i>F</i> | <i>p</i> |
|--------------------|----------------|--------------------|----------|----------|
| Between Groups     | 658123         | 600                | 1.46     | 0.2120   |
| Within Groups      | 6418           | 4                  |          |          |
| Total              | 664542         | 604                |          |          |

### **Job title.**

To assess the influence of job title on the perceived importance of professional values, two tests were performed. First, the relationship between the eight measures of job title was examined. The measures were administrator, corporate representative, instructor/faculty, program director, senior/lead technologist, staff technologist, supervisor/management and locum tenens (temporary staff). A one-way ANOVA indicated no significant difference in perception of importance of professional values across the eight variables ( $F = 1.13$ ,  $df = 7/539$ ,  $p < 0.1$ ). A higher level of perceived importance was reported in locum tenens (temporary staff) radiologic technologists ( $M = 258.88$ ,  $SD = 31.12$ ), followed closely by administrators ( $M = 257.83$ ,  $SD = 29.40$ ). With an  $N$  of 539, the resulting  $F$  value for differences between the demographic characteristic of job title was 1.13. The resulting  $p$  was 0.3441, which indicated **no significant difference among job titles**. Table 23 shows the source of variance,  $F$  ( $df_B$ ,  $df_W$ ), sum of squares, degrees of freedom, observed  $F$  values ( $F$ ), and significance level ( $p$ ).

Table 23  
*Results of One-way ANOVA for Job Title*

| Source of Variance | Sum of Squares | Degrees of Freedom | <i>F</i> | <i>p</i> |
|--------------------|----------------|--------------------|----------|----------|
| Between Groups     | 594249         | 600                | 1.13     | 0.3441   |
| Within Groups      | 8815           | 5                  |          |          |
| Total              | 603065         | 605                |          |          |

### Reliability Analysis

Reliability is used to determine if a scale consistently reflects the construct it is measuring (George & Mallery, 2003). Cronbach's alpha ( $\alpha$ ), a measure of internal consistency, is one of the most reported statistics of reliability in public health, education and the social and behavioral sciences (Kuijpers et al., 2013). Cronbach's  $\alpha$  is commonly used to determine if a scale of Likert questions in a survey is reliable. Cronbach's alpha reliability values of interest range between 0 and 1. The closer Cronbach's alpha coefficient is to 1.0, the greater the internal consistency of the items in the scale. George and Mallery (2003) provide the following rules of thumb: " $\alpha > 0.9$  is considered excellent,  $\alpha > 0.8$  is considered good,  $\alpha > 0.7$  is acceptable,  $\alpha > 0.6$  is questionable,  $\alpha > 0.5$  is poor, and  $\alpha < 0.5$  is considered unacceptable" (p. 231). A Cronbach's  $\alpha$  of values exceeding 0.70 indicate adequate internal reliability (Kuijpers et al., 2013; Morera, & Stokes, 2016).

Cronbach's  $\alpha$  was computed to measure the internal reliability of The Radiologic Technologists' Perceptions of Professional Values Scale. Each professional value had a Cronbach alpha of  $> 0.70$ , indicating the scale is reliable. The indicators within each professional value were averaged and resulted in scores ranging from 0.806 to 0.954. The

accountability subscale contained nine items ( $\alpha = 0.87$ ), the altruism subscale was comprised of four items ( $\alpha = 0.806$ ), the compassion/caring subscale consisted of eight items ( $\alpha = 0.90$ ), the excellence subscale consisted of 11 items ( $\alpha = 0.92$ ), the integrity subscale consisted of 11 items ( $\alpha = 0.92$ ), the professional duty subscale consisted of seven items ( $\alpha = 0.83$ ), and the social responsibility subscale consisted of 11 items ( $\alpha = 0.95$ ). The Cronbach's alpha for the entire instrument (61 items) was  $\alpha = 0.97$ . Table 24 shows the professional values, the sample size for each variable, the number items for each response variable, or professional value, Cronbach's  $\alpha$ , and the average correlation between the items for each professional value. Cronbach's  $\alpha$  coefficients for the correlations between the items in the study. The range of the Cronbach's  $\alpha$  coefficients was from 0.806 to 0.954, which demonstrates that each construct is reliable.

Table 24  
*Results of Reliability Analysis*

| Professional value       | Number of responses | Number of items | Cronbach's alpha | Average correlation between items |
|--------------------------|---------------------|-----------------|------------------|-----------------------------------|
| Accountability           | 600                 | 9               | 0.870            | 0.426                             |
| Altruism                 | 603                 | 4               | 0.806            | 0.509                             |
| Compassion/<br>Caring    | 604                 | 8               | 0.901            | 0.532                             |
| Excellence               | 593                 | 11              | 0.929            | 0.543                             |
| Integrity                | 593                 | 11              | 0.924            | 0.525                             |
| Professional<br>Duty     | 599                 | 7               | 0.839            | 0.427                             |
| Social<br>Responsibility | 587                 | 11              | 0.954            | 0.653                             |
| Total Score              | 540                 | 61              | 0.978            | 0.422                             |

In summary, Cronbach's  $\alpha$  was computed to measure the internal reliability of The Radiologic Technologists' Perceptions of Professional Values Scale. Each professional value had a statistically significant positive correlation, indicating the scale is reliable. The indicators within each professional values were averaged and resulted in scores ranging from 0.806 to 0.954. The Cronbach's alpha for the total score of 61 items was  $\alpha = 0.97$ .

### **Summary**

The Radiologic Technologists' Perceptions of Professional Values Scale (RTPPVS) was used to determine the perception of importance of professional values of 716 practicing radiologic technologists. Demographic data was used to determine if professional values varied based on age, gender, state of residence, years of experience, level of education, and job title. Data analysis of the Radiologic Technologists' Perceptions of Professional Values Scale revealed, the highest mean scores were most often altruism items, with integrity items scoring second and accountability items scoring third. The social responsibility items were scored the lowest. Ultimately, 505 respondents perceived that it is important or very important to the profession to articulate professional values. Approximately 37% of respondents ( $N = 224$ ) perceived it is most important and 46% ( $N = 281$ ) of respondents perceived it is very important for the profession of radiologic technology to articulate professional values.

A one-way ANOVA on the RTPPVS means of all demographic groups of gender, age, state of residence, years of experience as a radiologic technologist, education level, or job title showed no significant differences between groups. The Cronbach's alpha for the total score of 61 items was  $\alpha = 0.97$ , indicated instrument reliability.

## **CHAPTER 5**

### **DISCUSSION AND RECOMMENDATIONS**

Unfortunately, the profession of radiologic technology has failed to identify and or explicitly articulate professional values (Nortje' & Hoffman, 2017). For many healthcare disciplines, professionalism is demonstrated by the extent to which members of a profession are motivated by shared professional values that uniquely define the profession (Guenther et al., 2014; Nixon, 2001; Schlabach, 2017).

The purpose of this study was to determine radiologic technologists' perception of the importance of professional values as well as the perception of the importance to articulate determine if radiologic technologists feel it is important to articulate those values. Results of this study indicated that practicing radiologic technologists perceive professional values as important and that professional values should be articulated for the profession.

The premise of the three research questions addressed in this study were as follows: (a) Which professional values are perceived as most important to practicing radiologic technologists? (b) Do ASRT members perceive it important for the radiologic technology profession to explicitly articulate professional values? (c) Are there significant differences in the perceived level of importance of professional values between radiologic technologists' according to demographic characteristics?

## Summary of the Study

Literature on research involving practicing radiologic technologists' perceptions of professional values is practically nonexistent. Original research, indicating the perception of professional values of practicing radiologic technologists, was not identified. Though professional values are important and should be discipline specific, such values are lacking in the radiologic technology profession.

Peer and Schlabach (2009) asserted that professional values are formidable, engrained concepts that are adopted during professional education and influence future practitioners. The definition of professional values, from a radiologic technologists' perspective, has typically included "regulatory requirements, aligning our profession's outcomes and behaviors and the moral imperative that being professional is the right thing to do" (Kelly et al., 2016, p. 531). It has been assumed that students develop professional values during matriculation through allied health programs, and experience additional value development in the clinical environment post-graduation (Blaise et al., 2006). Published research, however, does not support one true path in development of professional values, especially for radiologic technologists (Clark, 2009).

Participants in this study were practicing radiologic technologists with varying education levels, years of experience, job titles, and ages, residing in 48 of the 50 United States. The Radiologic Technologists' Perceptions of Professional Values Scale, a 61-item survey, asked the participant to rate perceived importance of sample indicators of seven core values. The survey also included demographic data related to gender, age, state of residence, education level, years of experience and job title. One research question

about the perceived importance of articulating professional values was asked. A discussion of the findings follows.

### **Summary of the Findings**

Demographics of the sample will be delineated first followed by a discussion of the study's three research questions. Results of each research question will be discussed in this section. Three research questions investigated in this study were as follows:

Research Question 1: Which professional values are perceived as most important to practicing radiologic technologists as measured by a mean score of 3.0 or greater?

Research Hypothesis: If a professional value is scored as 3.0 or greater, then it will be perceived as important to practicing radiologic technologists.

Research Question 2: Do ASRT members perceive it important for the radiologic technology profession to explicitly articulate professional values as measured by a score of 4.0 or greater?

Research Hypothesis: If a mean score of 4.0 or higher is achieved, then it will demonstrate the importance of the profession of radiologic technology explicitly articulating professional values.

Research Question 3: Are there significant differences in the perceived level of importance of professional values between radiologic technologists' according to demographic characteristics?

Statistical Hypothesis: There is no significant difference between perceived level of importance of professional values and the demographic characteristics of level of education, years of experience, job position, age and gender.

### **Demographic data**

Demographic data was similar to other studies with the majority of participants being females (Clark, 2009) (Schlabach, 2017). Seventy-five percent ( $N = 533$ ) was female, a percentage consistent with the ASRT's reported membership statistics for 2017. Respondents had a mean age of 49, and with approximately 45% indicating over 21 years of experience. Approximately 42% of respondents had earned an associate degree and a majority (approximately 61%) identified and as a staff technologist.

**Research Question 1.**

Which professional values are perceived as most important to practicing radiologic technologists as measured by a mean score of 3.0 or greater? The research hypothesis for this research question: If a professional value is scored as 3.0 or greater, then it will be perceived as important to practicing radiologic technologists. The dependent variable is the factor total score. All seven professional values scored above a 3.0, indicating that radiologic technologists perceive professional values as important. Table 17 shows the number of participants, means and standard deviations of respondents' perception of importance of the total scores for each of the professional values. This question listed the professional values of accountability, altruism, compassion/caring, excellence, integrity, professional duty, and social responsibility. Each professional value listed examples of sample behaviors.

Altruism ranked as the most important of the professional values. For this professional value, there were four sample behaviors: acting in the best interest of the patient, providing services to humanity with full respect for the dignity of mankind, providing patient care that goes beyond expected standards of practice, and completing patient care and professional responsibility prior to personal needs. The mean score for this professional value, and each sample behavior, was 4.47. These mean scores indicated altruism is perceived as important to the practicing radiologic technologist, a meaningful outcome since these behaviors are imperative in professional practice. This finding is similar to that of Nortje' and Hoffman's (2017), study on radiography students. Altruism is becoming increasingly more important since the public sector is expecting a commitment from healthcare clinicians to treat them inclusively in healthcare choices.

This attribute is an important pre-requisite for allied health professions and, fortunately, can be increased by education, practice and reinforcement (Nortje' & Hoffman, 2017). Altruism is also an important value for physical therapists, as stated by Guenther, et. al. (2014). This finding is not surprising. Many allied health professionals feel altruism is an important value (McGinnis, et. al, 2016; Peer & Schlabach, 2009).

Integrity ranked as the second most important professional value. There were 11 sample behaviors for integrity; abiding by the rules, regulations, and laws applicable to the profession, adhering to the highest standards of the profession (scope of practice, ethics, etc.), articulating and internalizing stated ideals and professional values, practicing ethical conduct appropriate to the profession, being trustworthy, taking responsibility to be an integral part in the continuing management of patients, knowing one's limitations and acting accordingly, confronting harassment and bias among ourselves and others, recognizing the limits of one's expertise and seeking assistance appropriately, choosing employment situations that are congruent with practice values and professional ethical standards and acting on the basis of professional values. Overall, this professional value, and each of the sample behaviors, reported a mean score of 4.39. Therefore, since integrity scored above a 3.0, integrity is perceived as important to the practicing radiologic technologist. The results indicated a strong endorsement of the core value of integrity. Specifically, the indicators of being trustworthy and adhering to the highest standards of the profession (scope of practice, ethics, etc.) were strongly supported.

Integrity is a common professional value in many allied health professions and radiologic technology is no different (Schlabach, 2017). Healthcare professionals want to be perceived as trustworthy when caring for patients. The sample behavior of

“confronting harassment and bias among ourselves and others” scored the lowest of the behaviors for this professional value. It is possible that participants have not encountered situations of harassment and bias frequently or that appropriate responses to those situations have occurred. In this example, even one such action would be an embodiment of the professional value of integrity. The scores indicated that radiologic technologists perceive these indicators as very important. This finding is similar to the perception of professional values of physical therapists, athletic trainers, nurses and medicine (Guenther, et al., 2014; Schlabach, 2017).

Accountability ranked as the third most important professional value. This professional value had nine sample behaviors; responding to patient’s needs, supporting colleagues and associates in providing quality patient care, acknowledging and accepting consequences of his/her actions, assuming responsibility for professional decisions, adhering to code of ethics, standards of practice, and policies/procedures that govern the conduct of professional activities, communicating accurately to others (patients, other health care providers) about professional actions, seeking continuous improvement in quality of care, maintaining membership in professional organizations, and educating students in a manner that facilitates the pursuit of learning. Overall, this professional value, and each of the sample behaviors, reported a mean score of 4.29.

Responding to patient’s needs ranked the highest with a mean of 4.59, while educating students in a manner that facilitates the pursuit of learning ranked the lowest with a mean score of 3.48. Therefore, since accountability scored above a 3.0, accountability is perceived as important to the practicing radiologic technologist. These results indicate that the RT’s think it is essential to respond to patient’s needs. Adhering

to code of ethics, standards of practice, and policies/procedures that govern the conduct of professional activities, ranked the second highest. Radiologic technologists must demonstrate the behaviors of responding to patient's needs and adhering to practice standards in the clinical setting, as evidenced by first statement in the Code of Ethics for Radiologic Technologists which states that the RT should respond to patient needs.

"Educating students in a manner that facilitates the pursuit of learning" ranked the lowest among the respondents. This low ranking may be due to the fact that the respondents do not have the opportunity to mentor students because students are not present in the work environment, or, because not all radiologic technologists welcome the mentoring opportunity.

In healthcare settings, mentoring describes the supervision of a student in the clinical setting by a qualified practitioner. It is unfortunate that respondents do not endorse this behavior. Students cannot learn the role of the radiologic technologist without successful mentorship. Even though this behavior ranked lower than the other behaviors, overall the professional value of accountability ranked as important. This finding is similar to that of Nortje' and Hoffman (2017), who reported a high ranking in the attribute of accountability in radiography students.

Compassion/caring was ranked as the fourth most important professional value. This professional value had eight sample behaviors; understanding the socio-cultural, economic, and psychological influences on the individual's life in their environment, understanding the patient's perspective, being an advocate for patient's' needs, communicating effectively, both verbally and non-verbally, with others taking into consideration individual differences in learning styles, language, and cognitive abilities,

etc., recognizing and refraining from acting on one's social, cultural, gender and sexual biases, embracing the patient's emotional and psychological aspects of care, attending to the patient's personal needs and comforts, and demonstrating respect for others and considers others as unique and of value. Overall, this professional value, and each of the sample behaviors, reported a mean score of 4.23. "Demonstrating respect for others and considers others as unique and of value" was ranked the highest with a mean of 4.42, while understanding the socio-cultural, economic, and psychological influences on the individual's life in their environment ranked the lowest with a mean score of 3.86. Therefore, since compassion/caring scored above a 3.0, compassion/caring is perceived as important to the practicing radiologic technologist. "Demonstrating respect for others and considers others as unique and of value" scored the highest among the behaviors for caring/compassion. This finding is not surprising since demonstrating respect for patients is a focus of the Code of Ethics for radiologic technologists. "Understanding the socio-cultural, economic, and psychological influences on the individual's life in their environment" scored the lowest. This finding may be related to the education level of the respondents.

The associate degree became the required entry level of education in 2015; prior to that time, only a certificate was required. At the certificate level of preparation, respondents may not have had education regarding the socio-cultural, economic, and psychological influences on patients. As of 2017, education in these influences is included in the radiologic technology curriculum.

Overall, the results indicate that caring/compassion behaviors are highly important to radiologic technologists, with six of the seven indicators scoring above a

4.10. This finding is similar to the perception of professional values of physical therapists, who also ranked caring/compassion as an important professional value (Guenther, et. al., 2014).

Professional duty ranked as the fifth most important professional value. The seven sample behaviors included demonstrating beneficence by providing “quality patient care,” using techniques appropriately to minimize radiation exposure to the patient, self and other members of the healthcare team, preserving the safety, security and confidentiality of individuals in all professional contexts, being involved in professional activities beyond the practice setting, promoting the profession of radiography, mentoring others to realize their potential, obtaining information for the physician to aid in the diagnosis and treatment of the patient. Overall, this professional value, and each of the sample behaviors, reported a mean score of 4.14.

“Using techniques appropriately to minimize radiation exposure to the patient, self and other members of the healthcare team” was ranked the highest with a mean of 4.69. while “being involved in professional activities beyond the practice setting” ranked the lowest with a mean score of 3.33. Therefore, since professional duty scored above a 3.0, professional duty is perceived as important to the practicing radiologic technologist. The results indicate that there is strong endorsement of the behavior of minimizing radiation exposure to the patient, self and other members of the healthcare team.

Of the 61 items in the survey instrument, minimizing radiation exposure item scored the highest. Minimizing radiation exposure is very important since this behavior is part of the RT Code of Ethics (ARRT, 2016) and current literature documents excessive radiation doses from medical uses (Johnston, et al., 2011). Radiation exposure from

medical imaging is increasing at an alarming rate and ionizing radiation has the potential to cause harm (Statkiewicz-Sherer, et al., 2018). Additionally, minimizing radiation exposure is included in the radiography curriculum and the content specifications for the certification examination of radiologic technologists'

“Being involved in professional activities beyond the practice setting” ranked the lowest with a mean score of 3.33. This finding is unfortunate considering this behavior is included in the Code of Ethics. This item may have scored low because RTs are unaware of the benefits of being involved in professional activities beyond the practice setting. Radiologic technologists should be cognizant of the value of active participation in professional activities.

Radiologic technologists should support professional organizations since professional organizations provide a united voice for the profession. One example of this unity is related to state licensure. At this time, there are six states that do not require radiologic technologists' to be licensed. Approximately, 20 years ago, this number was roughly 25. The ASRT, working in collaboration with state organizations, supported state legislative initiatives that promoted safety and quality patient care through licensure.

Another cornerstone for professional development is continuing education, which is a requirement for the renewal of certification and registration for the radiologic technologist. This essential component of the profession results from constant advancing technology and changing job responsibilities. Technological advances occur frequently, and the radiologic technologist must be aware of the advances to continue to provide quality patient care. Participation in continuing education demonstrates accountability to peers, physicians, healthcare facilities, and the public.

Overall, the professional value of professional duty reported a mean score of 4.14. Therefore, even though professional duty ranked as fifth, it is perceived as important to the practicing radiologic technologist.

Excellence was ranked as the sixth professional value. This professional value had 11 sample behaviors; demonstrating investment in the profession of radiography, internalizing the importance of using multiple sources of evidence to support professional practice decisions, participating in integrative and collaborative practice to promote high quality health and educational outcomes, assessing situations, exercising care, discretion and judgment, demonstrating high levels of knowledge and skill in all aspects of the profession, practicing technology founded upon theoretical knowledge and concepts, using equipment consistent with the purposes for which it was designed, pursuing new evidence to expand knowledge, engaging in acquisition of new knowledge throughout one's professional career, sharing one's knowledge with colleagues and contributing to the development and shaping of excellence in all professional roles. Even though this professional value ranked as sixth, overall, this professional value, and each of the sample behaviors, reported a mean score of 4.10. "Assessing situations, exercising care, discretion and judgment" was ranked the highest with a mean of 4.42. This finding is fitting considering this behavior is mentioned in the Code of Ethics and is common practice for RTs.

The third highest scoring indicator for the core value of excellence was "using equipment consistent with the purposes for which it was designed", with a mean score of 4.35. Technical skills are an attribute of the professional identity of radiologic technologists (Niemi & Paasivaara, 2007). The foundation of radiologic technologists'

professional identity is the mastery of technology based on specialized skills and expertise, which has a considerable effect on patient care in the form of radiological exams performed and care received.

“Internalizing the importance of using multiple sources of evidence to support professional practice decisions” ranked the lowest with a mean score of 3.83. This finding may be due to the ambiguous nature of the stated behavior. This behavior was listed in the original instrument, the Professionalism in Physical Therapy Core Values Self-Assessment, therefore, it may not translate to the practice of radiologic technology. Moving forward, this behavior should be stated more clearly or removed from the instrument. Also, this behavior is not mentioned in the ARRT Code of Ethics or the ASRT Practice Standards.

Overall, excellence scored above a 3.0, therefore, excellence was perceived as important to the practicing radiologic technologist. The ranking of excellence as the sixth core value is consistent with the findings of Guenther et al. (2014). Physical therapists also ranked excellence behind caring/compassion, accountability, and integrity. Excellence is one of the core professional values associated with professionalism. The indicators comprising the value of excellence are incorporated through radiologic technology curriculum and practice.

Social responsibility was ranked as the least important of the professional values. This professional value had 11 sample behaviors; advocating for the health and wellness needs of society including access to health care and radiography services, promoting cultural competence within the profession and the larger public, promoting social policy that effect function, health, and wellness needs of patients, ensuring that existing social

policy is in the best interest of the patient, advocating for changes in laws, regulations, standards, and guidelines that affect the radiology profession, promoting community volunteerism, participating in political activism, participating in achievement of societal health goals, understanding of current community wide, nationwide and worldwide issues and how they impact society's health and well-being and the delivery of radiology services, providing leadership in the community and participating in collaborative relationships with other health practitioners and the public at large. Overall, this professional value, and each of the sample behaviors, reported a mean score of 3.40.

“Ensuring that existing social policy is in the best interest of the patient” was ranked the highest with a mean of 3.82, while “participating in political activism” ranked the lowest with a mean score of 2.51. Therefore, since social responsibility scored above a 3.0, social responsibility is perceived as important to the practicing radiologic technologist. The professional value of social responsibility ranked as the least important of the professional values, especially for the behaviors of political activism and providing leadership in the community.

Political activism is not typically identified as a behavior for the RT, which may be why this behavior scored the lowest of the 61 items in the instrument. This behavior is not mentioned in the ARRT Code of Ethics or the ASRT Practice Standards. This behavior was listed in the original instrument, the Professionalism in Physical Therapy Core Values Self-Assessment, therefore, it may not be pertinent to the practice of radiologic technology. Moving forward, this behavior should be stated more clearly or removed from the instrument.

The finding related to “providing leadership in the community” is of concern because research has identified that participation in the community, if implemented during the educational process, is beneficial in shaping an individual into the role of a health care professional (Guenther, et al., 2014). Student participation in community service results in increased awareness of social responsibility. Students who participated in these projects demonstrated a commitment to clients served and had a better understanding of advocacy, compassion, caring, and social responsibility. Consequently, educational programs need to include multiple community service experiences for RT students in order to promote awareness and increase demonstration of these values. The findings for this professional value may be an indication that in the professional evolution of RTs, we have not yet evolved to embrace fully the indicators described for social responsibility.

**Overall findings.**

The findings of this study indicated that professional values are perceived as important to practicing radiologic technologists’. Even though the profession of radiologic technology has been in existence for over 100 years, the recognition as a profession is relatively new; however, the profession has made significant strides towards becoming a recognized and respected healthcare profession. This evolution included a change in the education requirement of the entry-level radiologic technologist from a certificate to an associate degree. The next step is to adopt and articulate professional values.

Professional values relate to beliefs individuals have regarding what is good or desirable as a member of a profession and often expand on the individual’s personal

values (Blais et al., 2006). Development of professional values in radiologic technology students begins through professional socialization while the student is in the educational program (Blais et al., 2006; Keller et al., 2017). The professional values of the practicing radiologic technologists are influenced by their educational background, workplace, and, more specifically, the individual's philosophy of what it means to be and act as a radiologic technologist (Niemi & Paasivaara, 2007). Radiologic technology faculty are critical in the development of professional values since this development begins with students through the professional socialization process in school.

In conclusion, altruism, integrity, and accountability ranked the as the top three most important professional values, compassion/caring was ranked fourth, with professional duty, excellence, and social responsibility following. Overall, these findings are similar to that of Guenther et al. (2014), who studied the integration of professional values of physical therapists. Participants most often associated with experiences in the core values of altruism, integrity, and accountability; and least frequently correlated with social responsibility experiences (Guenther et al., 2014). Altruistic behaviors of offering free services to the underserved were rare. No relationship was noted between participants' varied professional and post-professional experiences related to the core values. In conclusion, six of the seven professional core values were well integrated into practice for these participants. However, social responsibility was not consistently demonstrated (Guenther et al., 2014).

### **Research Question 2.**

Do ASRT members perceive it important for the radiologic technology profession to explicitly articulate professional values as measured by a score of 4.0 or greater? The

research hypothesis for this research question stated: If a mean score of 4.0 or higher is achieved, then it will demonstrate the importance of the profession of radiologic technology explicitly articulating professional values. The dependent variable is the factor total score. The mean score for this question was 4.15, with 607 responses. The overwhelming majority of respondents, 96.37% ( $N = 585$ ), perceive it as very important, most important or important to articulate professional values. This finding indicated that radiologic technologists would be open to the integration of professional values in the process of professional socialization, which begins during the educational process and continues through interaction with peers in the health care setting. This socialization in students can commence by explicitly introducing the values of the profession, and continue in professional practice by including professional values in the guiding documents of the profession.

Professional values promote a framework that fosters excellence in clinical judgments in practice and a sense of professional commitment (Peer & Schlabach, 2009). Professional values are compelling and effective and influence and encourage consistent patterns of behaviors, decisions, and practice and are shared by all members of a professional group. Professional values convey a sense of uniqueness and will sustain the professional identity, but unfortunately, a concise definition of professionalism and professional values is lacking in radiologic technology. Compounding this problem is the fact that measurement instruments are, for the most part, absent with respect to professional behaviors and attitudes. The creation of the Radiologic Technologists' Perceptions of Professional Values Scale is an initial step toward identifying and articulating professional values for the radiologic technologist.

**Research Question 3.**

Are there significant differences in the perceived level of importance of professional values between radiologic technologists' according to demographic characteristics? The statistical hypothesis for this research question: There is no significant difference between perceived level of importance of professional values and the demographic characteristics of level of education, years of experience, job position, age and gender. Data were analyzed using a one-way ANOVA. The study indicated there were no significant differences in the score of the perceived level of importance of the professional values according to demographic characteristics of gender, age, level of education, years of experience, and job position.

This study indicated that practicing radiologic technologists perceive professional values as important, and that there is no significant difference between the perceived level of importance of professional values and the demographic characteristics of gender, age, years of experience, level of education, and job title. This finding is substantial, indicating that RTs have embraced the role of the radiologic technologist and share the professional values of accountability, altruism, caring/compassion, excellence, integrity, professional duty, and social responsibility despite demographic variables. Radiologic technologists' perceptions of professional values arise from a personal understanding of the concept of professionalism and through professional socialization.

**Creation of Instrument for Measurement of Professional Values**

Meaningful, reliable, and valid assessment is crucial in the promotion of professional values in radiologic technologists. The results of this study provide psychometric support for The Radiologic Technologists' Perceptions of Professional

Values Scale. The results of Denton et al. (2017) indicated content reliability and validity of the Professionalism in Physical Therapy Core Values Self-Assessment instrument as well as the feasibility as a tool for self-assessment. Since the changes made to the Physical Therapy Core Values Self-Assessment instrument were minimal and the original constructs did not change, the Radiologic Technologists' Perceptions of Professional Values Scale is a reliable and valid instrument. Cronbach's  $\alpha$  was computed to measure the internal reliability of The Radiologic Technologists' Perceptions of Professional Values Scale. Each professional value had a statistically significant positive correlation, indicating the scale is reliable. The Cronbach's alpha for the total score of 61 items was  $\alpha = 0.97$ .

On the basis of this study, it can be concluded that The Radiologic Technologists' Perceptions of Professional Values Scale is a reliable instrument to assess professional values in practicing radiologic technologists and radiologic technology students. The Radiologic Technologists' Perceptions of Professional Values Scale is a promising instrument for assessing the professional values of all radiologic technologists.

### **Discussion of Results using Feldman's Model**

Professional socialization is an interactive process of developing a professional identity based on values and meanings of the profession (McGinnis, et al., 2016) and contributes to the development of values and one's identity as a radiologic technologist through "incorporating values, skills, behaviors, and norms for professional practice" (Blais, Haynes, Kozier, & Erb, 2006, p. 19). When someone is learning the culture of a profession, values, and attitudes of that profession are realized (Gray & Smith, 1999).

Feldman's model of organizational socialization continues to contribute to the socialization of allied health professionals.

Students in professional education programs initially learn professional values and standards of that profession in the education setting through formal learning and socialization (Challen et al., 2016). That process continues as students graduate and join the workforce (Boyle et al., 1996) and enter the realm of organizational socialization and acquire the social knowledge and skills necessary to assume an organizational role (Chao et al., 1994). Feldman's model of organizational socialization is often recognized as the primary process by which people adapt to new jobs and organizational roles.

Feldman's three stage contingency model of organizational socialization, which details the phases of socialization, is used to highlight the process in which radiologic technologists assimilate to the professional role. Radiologic technology students' progress through the stages of anticipatory socialization, accommodation, and role management, with process variables at each stage, indicating successful completion of events crucial to that stage (Figure 1) (1976). According to Feldman's theory, as new employees are assimilated into organizations their behavior will be modified in the direction of the peer group (Boyle et al., (1996). The qualified radiologic technologists in the practice setting serve as role models for new graduates and lead the charge of professional socialization (Challen, et al., 2016). New employees will conform, comply, and work harder as they attempt to present themselves more favorably to enhance their inclusion of the group (Yielder & Davis, 2009). The model also includes four possible outcome variables of socialization: general satisfaction, mutual influence, internal work motivation, and job involvement or commitment to work.

## **Recommendations**

Relative to future directions, the professional body of radiologic technology should consider identifying and explicitly articulating professional values. Professional values are powerful. They are standards that shape and motivate consistent patterns of behaviors, decisions, and practice and are shared by all members of the professional group; based on the findings of this exploratory study, radiologic technologists perceive professional values as important.

The newly created The Radiologic Technologists' Perceptions of Professional Values Scale could be slightly modified and used as an assessment tool of professional values for practicing radiologic technologists and students. The current scale represents the importance of the behavior (1 = not important, 2 = somewhat important, 3 = important, 4 = very important, 5 = most important) for each statement. The scale should be revised to represent the frequency with which the RT demonstrates the behavior (1 = never, 2 = rarely, 3 = occasionally, 4 = frequently, 5 = always).

## **Implications for Practice**

### **Education of Radiologic Technologists.**

Radiography education continues to evolve to meet the demands of the profession (Cox & Killion, 2010). Radiologic technology students should be educated in professional values because research implies that educating students in professional values are imperative (Nortje' & Hoffman, 2017). This research indicated that the perception of professional values is important to practicing radiologic technologists, therefore, professional values should be included in the education of future radiologic technologists. Students are engaging in leadership activities in the classroom, at the state

and national levels. The discovery and articulation of explicit professional values during the development of leadership skills will provide a framework for the radiologic technology profession to be sustained.

Effective teaching of professionalism should incorporate a 3-stage process with respect to student learning and performance: set expectations, provide experiences and evaluate outcomes (McGinnis, et al., 2016). The expectations are presented in the classroom. The experiences typically take place in the clinical setting. Specifically, professional development should include a variety of experiences to develop both clinical skills and professional behaviors and values. Once these experiences take place, the faculty should evaluate the learning through assessment. Educators could teach professional values and use The Radiologic Technologists' Perceptions of Professional Values Scale to assess the professional values in students as a student learning outcome. The RTPPVS could be used as an assessment tool to meet the accreditation requirement of measuring professionalism in students. Also, students could use the instrument for self-assessment. By incorporating the 3-stage process, RT educators will enhance self-awareness in students thus supporting more understanding of the importance of professionalism.

### ***Curriculum design.***

#### **ASRT radiography curriculum.**

The aim of the ASRT curriculum is to provide a framework of a common body of knowledge that is essential for entry-level radiologic technologists (ASRT, 2016a). The challenge of any curriculum is to provide students with a strong foundation of essential knowledge while also affording opportunities to acquire skills that will serve them

beyond the entry-level of the radiologic sciences (Cox & Killion, 2010). The published curriculum serves as a guideline for educators to follow in designing their programs and ensuring that their programs match the profession's standards (ASRT, 2016a).

Currently, there is a small section related to professionalism, buried within the patient care section. The professionalism section does not include specific professional values. Professional values, which define the profession, should be included in the radiologic technology curriculum. Currently, the radiography curriculum includes a section on ethics. Professional values could be added to the current content of ethics, or they could be woven throughout the curriculum of an educational program. The addition of professional values to the curriculum provides a foundation to professional socialization through a common understanding that is not dependent on employment setting, age, or position.

It is critically important that undergraduate didactic and clinical courses include what professionalism entails and not assume that students are familiar with the concept. Educators should clearly articulate expectations of and definitions for professional values in the classroom and clinical settings. Additionally, educators should embody professional values and serve as mentors and role models for their students in the classroom and the clinical setting. In the clinical setting, there should be an opportunity for reflection of clinical practice and feedback from clinical faculty. The practicing radiologic technologists, also serve as role models for teamwork, technical performance, and communication. Teaching professional values to radiologic technologists should be a theme that is woven throughout the curriculum of an educational program. It is imperative to integrate the core values, accountability, altruism, compassion/caring,

excellence, integrity, professional duty and social responsibility, into radiologic technologists' education and practice. In addition, professional values should be added to the radiography curriculum and the guiding documents of the profession, the ASRT Practice Standards and the ARRT Code of Ethics.

***Accreditation of radiologic technology programs.***

Accredited radiography programs are required to measure professionalism in their students as a student learning outcome (JRCERT, 2014). However, this task is very difficult, given that the profession has not articulated professional values nor does the JRCERT specify a mechanism to measure and assess professionalism in radiologic technology students.

Based on the outcomes of this study, the profession should adopt professional values as a core tenet of the profession. Professional values should be added to the guiding documents of the profession, the ASRT Practice Standards and the ARRT Code of Ethics. Once this is done, The Radiologic Technologists' Perceptions of Professional Values Scale could be used as an assessment instrument for radiologic science educational programs. Educators can measure professionalism in their students and remediate as needed. Utilizing the newly developed Radiologic Technologists' Perceptions of Professional Values Scale, a revision of the Professionalism in Physical Therapy Core Values Self-Assessment, would promote the accreditation requirement of measuring professionalism in radiologic technology students as a student learning outcome.

**Professional practice.*****Guiding documents.***

The guiding documents of the profession, the ASRT practice standards and the ARRT's code of ethics, continue to evolve and provide a framework for the profession. These documents should be revised to include professional values as part of professionalism. The sample indicators, used in this research, were developed from these two documents. Incorporating professional values in these two documents will enhance integration into clinical practice. The ASRT Practice Standards are divided into four parts; scope of practice, clinical performance standards, quality performance standards and professional performance standards. Professional performance standards define the activities of the individual in the areas of education, interpersonal relationships, self-assessment, and ethical behavior. Professional values could be added to the section of Professional Performance Standards. The ARRT's Code of Ethics includes 10 statements of expected ethical behavior. One statement mentions professionalism, professional values could be added to this statement.

**ASRT Practice Standards.**

A profession's practice standards serve as a guide for appropriate practice (ASRT, 2016b). The ASRT Practice Standards describe the practice and determine general principles to govern compliance. The practice standards of a profession should include the collective professional values of the group (Peer & Schlabach, 2009). Practice standards are authoritative statements created by the profession for gaging the quality of practice, service and education offered by individuals who practice in radiologic technology (ASRT, 2016b; Peer & Schlabach, 2009). The practice standards can be

utilized by individual facilities to develop job descriptions and practice parameters. The practice standards include performance standards related to activities of the individual in the areas of education, interpersonal relationships, self-assessment, ethical behavior, care of patients, and delivery of diagnostic procedures. The document does not include specific behaviors of professional values. Professional values should be added to the practice standards.

Currently, the ASRT Practice Standards include the recommendation of self-assessment of personal performance (ASRT, 2016b). The practice standards indicate self-assessment as necessary for personal growth and professional development. However, there are no recommendations regarding how the radiologic technologist should self-assess. The Radiologic Technologists' Perceptions of Professional Values Scale could be used as a self-assessment tool for the practicing radiologic technologist. The RT could self-assess annually, possibly during annual performance evaluation. If the RT does not work in a facility that performs annual performance evaluations, the literature recommends a self-assessment periodically. The simple act of completing the Radiologic Technologists' Perceptions of Professional Values Scale provides structure for purposeful reflection. For areas that are identified as needed strengthening, the RT could seek education in that area. A periodic self-assessment of the core values provides continued professional development of the core values. This process can also be used for the new ARRT requirement of continuing qualification requirements, which is discussed in a later section.

This research indicated that the ASRT membership perceives the importance of articulating professional values. Therefore, the ASRT should adopt, promote, and

articulate, professional values in radiologic technologists. Adoption of professional values includes adding professional values to the practice standards, since the practice standards are a guiding document of the profession. Professional values promote a framework that fosters excellence in clinical judgments in practice and a sense of professional commitment (Peer & Schlabach, 2009). Additionally, The Radiologic Technologists' Perceptions of Professional Values Scale could be used as an assessment instrument for practicing radiologic technologists'.

### **ARRT Code of Ethics.**

The ARRT's Code of Ethics (Appendix A) is a set of guidelines for the profession (ARRT, 2016). Currently, the code of ethics includes one statement regarding professional behavior, basically, stating, to act professional. This one statement indicates the profession's thoughts on professional values. However, based on the findings of this study, this statement does not adequately reflect RT's perceptions of the importance of professionalism and professional values. The professional values in this study, accountability, altruism, compassion/caring, excellence, integrity, professional duty and social responsibility, include ethical indicators. If the code of ethics is indeed a guiding document of the profession, professional values should be added to the standards of ethics, if not adopted as a separate document. Once this research is published, the guiding documents of the profession should be revised to include professional values.

### **ARRT continuing qualification requirements**

Continuing qualification requirements (CQR) are being implemented due to the continual evolution of technology and an increased demand of accountability from patients (ARRT, 2017). Beginning in 2020, RTs will be required to earn continued

professional education hours in an area that has been identified as a weakness. The ARRT describes CQR as a principle for radiologic technologists to assess knowledge and skills, and by doing so, the radiologic technologists' knowledge will improve and influence the ability to provide high-quality patient care. At this time, an instrument has not been implemented for self-assessment by the radiologic technologist. The newly developed Radiologic Technologists' Perceptions of Professional Values Scale could be revised and used as a part of the self-assessment for the radiologic technologist.

A revision of the newly developed Radiologic Technologists' Perceptions of Professional Values Scale survey will include changing the Likert scale options. The current scale represents the importance of the behavior (1 = not important, 2 = somewhat important, 3 = important, 4 = very important, 5 = most important) for each statement. The scale will be revised to represent the frequency with which the RT demonstrates the behavior (1 = never, 2 = rarely, 3 = occasionally, 4 = frequently, 5 = always). The RT could complete the instrument as a self-assessment. Since the instrument includes the professional values of accountability, altruism, compassion/caring, excellence, integrity, professional duty and social responsibility and sample indicators of these values, RTs can identify areas of weakness and complete continuing education in that area.

***Practicing radiologic technologists.***

Professionalism in radiologic technology is relatively new and no known studies have been conducted on radiologic technologists' perspectives on professionalism and, specifically, professional values. Yelder and Davis (2009) argued in their analysis of radiologic technologists' in the United Kingdom, that there is a struggle for the profession to be formally recognized; this is somewhat true in the United States as well.

The notion of whether a particular occupation is a profession has been debated by a variety of authors (Niemi & Paasivaara, 2007; Sim & Radloff, 2008; Yelder & Davis, 2009). The radiologic technology community needs to be proactive to gain recognition as a profession by the public and other allied health professions. Radiologic technologists possess special knowledge and skills, obtained through education and training, now, they should continue the process of professionalization by working towards a set of attributes that define the profession. The addition of the associate degree as the education requirement was a step in the right direction. Establishing professional values is the next step. The formation and internalization of values that are congruent with those practicing within a profession facilitates professional development and sustains professional identity (Peer & Schlabach, 2009).

#### **Self-assessment.**

Self-assessment is a critical element in the formation of professional identity. Since the ARRT will be requiring CQR in 2020, self-assessment will become a significant factor for practicing radiologic technologists'. Continuing Qualification Requirements have been implemented for medical professionals to assess their knowledge and skills. At this time, the ARRT has not developed an instrument for self-assessment by the radiologic technologist. The Radiologic Technologists Perceptions of Professional Values Scale, with a Likert scale similar to the Professionalism in Physical Therapy Core Values Self-Assessment, should be used by practicing radiologic technologists' as a self-assessment instrument to assess their progress and renew their commitment to the values of the profession. The results of the assessment instrument

could determine if education of professional values is needed. Then, education, or remediation, can be achieved in that area and this will satisfy the requirement of CQR.

***Radiology managers.***

Currently, radiology managers have two documents to guide the professional practice of radiologic technology, the ASRT Practice Standards and the ARRT Code of Ethics. However, these two documents merely mention professionalism, they do not expand on the professional values that are needed in professional practice. If the profession would adopt professional values, the radiology manager would have another tool to guide professional practice. The RTPPVS should be used by radiology managers to assess professional values in practicing radiologic technologists. The results of the assessment instrument could provide reflection and determine if education of professional values is needed. Completing the Radiologic Technologists' Perceptions of Professional Values Scale provides structure for purposeful reflection, which is important for professional growth. As leaders in the profession, radiology managers, should raise awareness of the profession's professional values advocated in the Radiologic Technologists' Perceptions of Professional Values Scale. Managers should instill a learning culture within the workplace where continuing professional development is openly discussed, this culture will enhance integration of the professional values into clinical practice. The effect of professional values on practice is significant, because they affect professional behavior and influence attitudes and beliefs.

***Effect on patients and the public.***

Professionalism is a necessary ingredient in a culture of safety (DuPree et al., 2011) and disruptive, or unprofessional, behavior, can contribute directly to medical

errors (Stewart et al., 2011). Disrespectful behavior creates an unhealthy or hostile work environment, causes some to abandon their profession, and, in the end, harms patients (Institute for Safe Medication Practices, 2014). These behaviors have been related to unfavorable events, medical errors, compromises in patient safety, and even patient mortality.

Today's patient expects quality patient care, and that care includes fulfilling the responsibilities of the social contract that exists between the health care provider and the public. The social contract includes the duties of self-regulation, professionalism and professional values, all of which are interrelated (Schlabach, 2017). In allied health professions, professionalism, in part, is characterized by the extent to which members of a profession are motivated by shared professional values that uniquely define the profession. Therefore, to provide quality care, radiologic technology needs to meet the responsibilities of the social contract with the public by adopting professional values.

***Advancing the profession.***

**Adoption of professional values.**

The study of professional values in radiologic technologists is new territory (Nortje' & Hoffman, 2017) and the profession has struggled to be formally recognized (Yielder & Davis, 2009). Relative to future directions, the profession of radiologic technology should consider identifying and explicitly articulating professional values, this process would start with the ASRT and the ARRT. (Schlabach, 2017). This study indicated that radiologic technologists perceive professional values are important, should be adopted, and articulated. Once this research is published, the guiding documents of the

profession must be revised to incorporate professional values. Professional values should be integrated into professional practice to encourage a commitment of professionalism.

#### **Revision of guiding documents.**

The subsequent step to advance the profession, professional organizations, specifically the ARRT and the ASRT, should be the revision of core documents to include professional values. In addition, radiologic technologists need to conduct research that adds to the professional body of knowledge (Nixon, 2001). Many RTs are already engaged in research, as demonstrated in peer reviewed journals, but more need to be proactive and realize practice is a legitimate source of research. The importance of research as a source of theory and development of the knowledge base will be increasingly recognized as the profession of radiologic technology strives to maintain professional status.

#### **Adoption of a professional self-assessment instrument.**

The radiologic technology profession must follow other allied health professions and adopt the Radiologic Technologists Perceptions of Professional Values Scale so that professionalism in radiologic technologists can be reliably and validly measured. The RTPPVS could become a core document on professionalism in radiologic technology practice, education and research, just as the Professional Core Values Self-Assessment tool accomplished for physical therapy. In order for the Radiologic Technologists' Perceptions of Professional Values Scale to become a core document of the profession, the ARRT and the ASRT should include professional values in their guiding documents of the Practice Standards and the Code of Ethics. Additionally, the ASRT should add professional values to the Radiography Curriculum. Then, the Radiologic Technologists'

Perceptions of Professional Values Scale could be incorporated as an assessment instrument. The assessment instrument could be utilized by educational programs, to meet the requirements of accreditation, practicing radiologic technologists' and radiology managers.

### **Conclusion of Recommendations**

The profession of radiologic technology has grown significantly in the last 25 years. Today, there are over 300,000 radiologic technologists nationwide (ARRT, 2017). Given the rapid increase in the number of radiologic technologists, a clear understanding of professional values, including the attitudes and behaviors of the profession, needs to be established. Ultimately, the Radiologic Technologists' Perceptions of Professional Values Scale, with minor revision, can serve as a metric for professional values in education and practice.

### **Implications for Further Research**

Results from this research indicated that radiologic technologists perceive the importance of the articulation professional values. While information gleaned from this study is insightful, it does not identify professional values, but it does provide a foundation and an impetus for further endeavors. Future research could include a multi-faceted approach, utilizing mixed methods to identify professional values for radiologic technologists. Mixed methods research is more specific in that it includes the mixing of qualitative and quantitative data. Once these values are identified, a study could be conducted regarding the integration of professional values among RTs.

A qualitative study could be conducted to enhance the RTs' perceptions of professional values that were identified in this research. The study could be administered

to radiologic technologists, radiologic technology educators, and students to compare and contrast the differences in the perceptual value differences among the three cohorts. The study could include scenarios and open-ended questions regarding attitudes and behaviors related to professional values. Also, suggestions for other professional values that have not been specifically mentioned could be allowed. Future research should utilize a longitudinal design to capture changes in professional values in the cohort groups.

Additional research could be performed to determine if there is a correlation between professional values and personal values. Faculty perceptions relative to modeling professional values to students, as well as faculty perceptions of professional values that promote a culture of safety need to be added to the research agenda.

Additional studies could be conducted within RT education programs to assess students' perceptions of professional values and include the identification factors influencing the development of professional values during the student experience. Also, it could be determined if professional values were perceived differently between first year students and last year students.

Research could also be conducted collaboratively by multidisciplinary teams regarding perceptions of professional values of other allied health professions to determine discipline specific similarities and differences.

This researcher would aspire to replicate this study on a larger scale. Members of the ASRT that practice mainly in diagnostic radiography were the only practice area of radiography that were included in this study. The replicated study could include RTs from other modalities, such as computed tomography, mammography, magnetic

resonance imaging, ultrasound, cardiovascular intervention, nuclear medicine, or radiation therapy.

An exploratory factor analysis should be conducted in future studies to establish construct validity of the Radiologic Technologists' Perceptions of Professional Values Scale. It is important to establish construct validity of The Radiologic Technologists' Perceptions of Professional Values Scale so the scale can be adopted by the profession and utilized in education and clinical practice. An exploratory factor analysis would also yield the final number of professional values. Nortje' and Hoffmann (2017), in their study of professionalism in radiography students in South Africa, recommended 12. However, the researcher feels this number is too large and some of the items should be combined.

The public and the radiologic technology profession expect radiologic technologists to graduate with an understanding of professional values and to be able to demonstrate those professional values. A research study of the factors influencing the development of professional values in radiologic technology students would provide educators with knowledge to facilitate the development of radiologic technologists' professional values. Having a better understanding and appreciation for how professional values develop will allow educators to become more effective in their teaching.

### **Limitations of Study**

Several methodological issues must be considered when interpreting the impact of this study's findings. First, the population of this study was limited to practicing radiologic technologists that are members of the ASRT. Radiologic technologists who are not members of the ASRT may differ from those who are members; therefore, generalizations may not be applicable to other populations or programs.

A purposeful and convenient sample was utilized, not a longitudinal sample, thereby limiting the results. The population of practicing radiologic technologists that responded to the survey are licensed in various states. Repeat studies with larger, randomized samples from a population, including all practice areas of radiologic technology would increase the generalizability of the findings.

Participants' personal values were not explored, and may have influenced the outcomes of this study as response bias may have been present. The questionnaire Likert scale survey has five options ranging from most important to not important. Participants may have scored an item high because they thought that was what they should do, instead of scoring as a reflection on their own values. This type of response is known as response bias. Response bias may be seen in studies where the participant must self-report perceptions.

The survey instrument was originally designed for a different group of allied health clinicians, specifically physical therapists, not radiologic technologists. Since there is no known instrument for radiologic technologists, this instrument was modified for radiologic technologists. This study is the first time this instrument has been utilized. However, Cronbach's  $\alpha$  was computed to measure the internal reliability of the instrument and indicated the scale is reliable.

Participants may not have taken time to give reflective thought to the questions resulting in data that is less in-depth. Overall, the survey could be considered lengthy, with a total of 61 items. Participants may have rushed through the items in an effort to complete the survey quickly, instead of reading each item, considering its importance and selecting a response.

## Conclusion

Many allied healthcare professions have identified and articulated professional values; unfortunately, the radiologic technology profession has not recognized the importance of the correlation between professional values and professionalism. Professional values can be linked to equivalent values-based behaviors such as accountability, altruism, compassion/caring, excellence, integrity, professional duty, and social responsibility.

The purpose of this study was to determine radiologic technologists' perception of professional values, determine if radiologic technologists think it is important to articulate professional values, and if there are differences in the perception of professional values based on demographic characteristics. This research is the first known study evaluating the perception of professional values of practicing radiologic technologists.

Accredited radiography programs are required to measure professionalism as a student learning outcome; however, this task is difficult, given that the profession has not articulated the professional values. Learning of professional values begins in the education setting through formal learning and socialization (Challen et al., 2016) and the process continues as students graduate and join the workforce (Boyle et al., 1996). The Radiologic Technologists' Perceptions of Professional Values Scale can be used as assessment tool to measure professionalism.

The findings of this study indicate that professional values are important to radiologic technologists. The Radiologic Technologists' Perceptions of Professional Values Scale was created and revealed that radiologic technologists' perceive

professional values as important and that the professional values should be articulated. As a component of professionalism, professional values encourage consistent patterns of behaviors, which are driven by deeply-rooted, internal motivations to do the right thing. In other words, do what you should do, not what you must do. In turn, the duty of self-regulation manifests as a consequence of influential shared professional values. Adopting and articulating professional values stimulate the appropriate professional conduct, thereby supporting the legal, ethical, and regulatory standards.

The results supported the importance of the identification and declaration of shared professional values. Professional values will promote values-based behaviors and internally motivate a duty to uphold the legal, ethical, and regulatory standards of the profession (Schlabach, 2017). Dedication to the radiologic technologists' professional responsibilities will sustain the social contract and encourage public trust.

These results provide the next step in advancing the profession of radiologic technology by establishing professional values as part of a professional identity. Radiologic Technology has evolved immensely since its inception, and continues to do so. The profession has made significant strides towards becoming a recognized and respected healthcare profession. This evolution included a change in the education requirement of the entry-level radiologic technologist from a certificate to associate degree.

The next critical step in professional evolution is the adoption and articulation of professional values. Radiologic science educational programs will be better equipped to teach and assess professional values. Lastly, directors of radiology departments will decide if education of professional values for radiologic technologists is needed.

## APPENDIX A

American Registry of Radiologic Technologists  
Code of Ethics

The Code of Ethics forms the first part of the Standards of Ethics and serves as a guide by which Registered Technologists may evaluate their professional conduct as it relates to patients, employers, colleagues, and other members of the healthcare team. The Code of Ethics is aspirational. See the entire document for ethics rules.

1. The radiologic technologist acts in a professional manner, responds to patient needs, and supports colleagues and associates in providing quality patient care.
2. The radiologic technologist acts to advance the principal objective of the profession to provide services to humanity with full respect for the dignity of mankind.
3. The radiologic technologist delivers patient care and service unrestricted by the concerns of personal attributes or the nature of the disease or illness, and without discrimination on the basis of sex, race, creed, religion, or socio-economic status.
4. The radiologic technologist practices technology founded upon theoretical knowledge and concepts, uses equipment and accessories consistent with the purposes for which they were designed, and employs procedures and techniques appropriately.
5. The radiologic technologist assesses situations; exercises care, discretion, and judgment; assumes responsibility for professional decisions; and acts in the best interest of the patient.
6. The radiologic technologist acts as an agent through observation and communication to obtain pertinent information for the physician to aid in the diagnosis and treatment of the patient and recognizes that interpretation and diagnosis are outside the scope of practice for the profession.
7. The radiologic technologist uses equipment and accessories, employs techniques and procedures, performs services in accordance with an accepted standard of practice, and demonstrates expertise in minimizing radiation exposure to the patient, self, and other members of the healthcare team.
8. The radiologic technologist practices ethical conduct appropriate to the profession and protects the patient's right to quality radiologic technology care.
9. The radiologic technologist respects confidences entrusted in the course of professional practice, respects the patient's right to privacy, and reveals confidential information only as required by law or to protect the welfare of the individual or the community.
10. The radiologic technologist continually strives to improve knowledge and skills by participating in continuing education and professional activities, sharing knowledge with colleagues, and investigating new aspects of professional practice (ARRT, 2016, p. 1).

## APPENDIX B

## IRB Approval

1 / 1



## The University of Louisiana at Monroe Institutional Review Board

### Notice of Determination for Projects using Human Subjects

Protocol ID#: 783 - 2018  
 Principal Investigator: Dr. Jessica Dolecheck  
 Collaborator(s): Kelli Welch Haynes  
 Project Title: The Importance of Professional Values from a Radiologic Technologists Perspective  
 Date Approved: 11/13/2017  
 Expiration Date: 11/12/2018

- 1) In accordance with the ULM Policy for the Protection of Human Subjects, the ULM Institutional Review Board reviewed and APPROVED this project on the above date. Note: The project is subject to continuing review and any conditions listed in the comments section below.
- a. This project has received FULL COMMITTEE REVIEW.
  - b. This project has received EXPEDITED REVIEW.
  - c. This project is EXEMPT based on the following part and section(s) of the ULM Policy for the Protection of Human Subjects:

Exempt:

- 2) In accordance with the ULM Policy for the Protection of Human Subjects, the ULM Institutional Review Board reviewed this project and has determined that this project does not meet IRB standards and is therefore DEFICIENT for the reasons listed in the comments section below.

Comments:

This project's "APPROVED" start date is determined according to the date listed above in this notification. Any research conducted, prior to this date, must cease and all data collected destroyed.

Thank you for your submission. Please contact the Office of Sponsored Programs and Research if you require any further assistance.

*Carl L. Thameling*

Carl L. Thameling, Ph.D.  
 Chair, ULM's IRB

cc: PI's Department Head  
 IRB protocol file

Monday, November 13, 2017

## Appendix C

*Professionalism in Physical Therapy Core Values Self-Assessment*

For each core values listed, a definition is provided and a set of sample indicators that describe what one would see if the physical therapist were demonstrating that core value in his/her daily practice. For each of the sample indicators listed, check only one item that best represents the frequency with which you demonstrate the behavior where 1 = Never, 2 = Rarely, 3 = Occasionally, 4 = Frequently, 5 = Always.

| Core Values    | Definition   | Sample Indicators   | Self-Assessment<br>1(N) 2(R) 3(O) 4(F)<br>5(A)   |
|----------------|--|---|--|
| Accountability | Accountability is active acceptance of the responsibility for the for the diverse roles, obligations, and actions of the physical therapist including self-regulation and other behaviors that positively influence patient/client outcomes, the profession and the health needs of society. | 1. Responding to patient's/clients goals and needs.   | 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> 5 <input type="checkbox"/> |
|                |  | 2. Seeking and responding to feedback from multiple sources.  | 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> 5 <input type="checkbox"/> |
|                |  | 3. Acknowledging and accepting consequences of his/her actions.   | 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> 5 <input type="checkbox"/> |
|                |  | 4. Assuming responsibility for learning and change.   | 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> 5 <input type="checkbox"/> |
|                |  | 5. Adhering to code of ethics, standards of practice, and policies/procedures that govern the conduct of professional activities. | 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> 5 <input type="checkbox"/> |
|                |  | 6. Communicating accurately to others (payers, patients/clients, other health care providers) about professional actions.         | 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> 5 <input type="checkbox"/> |
|                |  | 7. Participating in the achievement of health goals of patients/clients and society.  | 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> 5 <input type="checkbox"/> |
|                |  | 8. Seeking continuous improvement in quality of care.   | 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> 5 <input type="checkbox"/> |
|                |  | 9. Maintaining membership in APTA and other organizations.  | 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> 5 <input type="checkbox"/> |
|                |  | 10. Educating students in a manner that facilitates the pursuit of learning.  | 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> 5 <input type="checkbox"/> |
| Altruism       | Altruism is the primary regard for or devotion to the interest of  | 1. Placing patient's/clients' needs above the physical therapists.  | 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> 5 <input type="checkbox"/> |
|                |  | 2. Providing pro-bono services.   | 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> 5 <input type="checkbox"/> |



|            |  |   |   |
|------------|--|---|---|
|            |  | 11. Demonstrating respect for others and considers others as unique and of value.   | 1[] 2[] 3[] 4[] 5 []  |
| Excellence | Excellence in physical therapy practice that consistently uses current knowledge and theory while understanding personal limits, integrates judgment and the patient/client perspective, challenges mediocrity, and works toward development of new knowledge. | <p>1. Demonstrating investment in the profession of physical therapy.</p> <p>2. Internalizing the importance of using multiple sources of evidence to support professional practice decisions.</p> <p>3. Participating in integrative and collaborative practice to promote high quality health and educational outcomes.</p> <p>4. Conveying intellectual humility in professional and personal situations.</p> <p>5. Demonstrating high levels of knowledge and skill in all aspects of the profession.</p> <p>6. Using evidence consistently to support professional decisions.</p> <p>7. Demonstrating a tolerance for ambiguity.</p> <p>8. Pursuing new evidence to expand knowledge.</p> <p>9. Engaging in acquisition of new knowledge throughout one's professional career.</p> <p>10. Sharing one's knowledge with others.</p> <p>11. Contributing to the development and shaping of excellence in all professional roles.</p> | <p>1[] 2[] 3[] 4[] 5 []</p> |
| Integrity  | Integrity is steadfast adherence to high ethical principles or professional standards; truthfulness, fairness, doing what you say you will do, and "speaking forth" about why you do what you do.  | <p>1. Abiding by the rules, regulations, and laws applicable to the profession.</p> <p>2. Adhering to the highest standards of the profession (practice, ethics, reimbursement, Institutional Review Board [IRB], honor code, etc.)</p> <p>3. Articulating and internalizing stated ideals and professional values.</p>   | <p>1[] 2[] 3[] 4[] 5 []</p> <p>1[] 2[] 3[] 4[] 5 []</p> <p>1[] 2[] 3[] 4[] 5 []</p>   |





## APPENDIX D

*Radiologic Technologists' Perceptions of Professional Values Scale*

For each core values listed, a definition is provided and a set of sample indicators that describe what one would see if the radiologic technologist were demonstrating that core value in his/her daily practice. For each of the sample indicators listed, check only one item that best represents the importance of the behavior where (1 = Not Important, 2 = Somewhat Important, 3 = Important, 4 = Very Important, 5 = Most Important) for each statement.

| <b>Demographic Information</b>                     |   |  |  |
|--|---|--|--|
| Gender   | Male <input type="checkbox"/> Female <input type="checkbox"/>   |  |  |
| Age  | Fill in the blank   |  |  |
| Please select the state you live in:               | All states will be listed in a dropdown menu  |  |  |
| Years of Experience as a Radiologic Technologist   | 0-2 <input type="checkbox"/> 3-5 <input type="checkbox"/> 6-10 <input type="checkbox"/> 11-15 <input type="checkbox"/> 16-20 <input type="checkbox"/> 21-30 <input type="checkbox"/> 31 years or more <input type="checkbox"/>  |  |  |
| Highest Level of Education Completed               | Certificate <input type="checkbox"/><br>Associate Degree <input type="checkbox"/><br>Bachelor Degree <input type="checkbox"/><br>Master's Degree <input type="checkbox"/><br>Doctorate (including medical) <input type="checkbox"/><br>Other <input type="checkbox"/>   |  |  |
| Which title best describes your current job title? | Staff Technologist <input type="checkbox"/><br>Senior/Lead Technologist <input type="checkbox"/><br>Supervisor/Management <input type="checkbox"/><br>Instructor/Faculty <input type="checkbox"/><br>Program Director <input type="checkbox"/><br>Administrator <input type="checkbox"/><br>Corporate Representative <input type="checkbox"/><br>Locum Tenens (temporary staff) <input type="checkbox"/><br>Assistant Chief Technologist <input type="checkbox"/><br>Other <input type="checkbox"/> |  |  |
| <b>Core Values</b>                                 | <b>Definition</b>   | <b>Sample Indicators</b>   | <b>Self-Assessment<br/>1(N) 2(S) 3(I) 4(V)5(M)</b>   |
| Accountability                                     | Accountability is active acceptance of the responsibility for the for the diverse roles, obligations, and actions of the radiologic technologist including self-  | 1. Responding to patient's needs.<br><br>2. Supporting colleagues and associates in providing quality patient care.<br><br>3. Acknowledging and accepting consequences of his/her actions. | 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> 5 <input type="checkbox"/><br><br>1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> 5 <input type="checkbox"/><br><br>1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> 5 <input type="checkbox"/> |

|                       |  |   |   |
|-----------------------|--|---|---|
|                       | regulation and other behaviors that positively influence patient/client outcomes, the profession and the health needs of society.  | <p>4. Assuming responsibility for professional decisions.</p> <p>5. Adhering to code of ethics, standards of practice, and policies/procedures that govern the conduct of professional activities.</p> <p>6. Communicating accurately to others (patients, other health care providers) about professional actions.</p> <p>7. Seeking continuous improvement in quality of care.</p> <p>8. Maintaining membership in professional organizations.</p> <p>9. Educating students in a manner that facilitates the pursuit of learning.</p> | <p>1[] 2[] 3[] 4[] 5 []</p> |
| Altruism              | Altruism is the primary regard for or devotion to the interest of patients, thus assuming the fiduciary responsibility of placing the needs of the patient ahead of the radiologic technologists' self-interest. | <p>1. Acting in the best interest of the patient.</p> <p>2. Providing services to humanity with full respect for the dignity of mankind.</p> <p>3. Providing patient care that goes beyond expected standards of practice.</p> <p>4. Completing patient care and professional responsibility prior to personal needs.</p>   | <p>1[] 2[] 3[] 4[] 5 []</p>                             |
| Compassion/<br>Caring | <p>Compassion is the desire to identify with or sense something of another's experience; a precursor of caring.</p> <p>Caring is the concern, empathy, and consideration for the needs and values of others.</p> | <p>1. Understanding the socio-cultural, economic, and psychological influences on the individual's life in their environment.</p> <p>2. Understanding the patient's perspective.</p> <p>3. Being an advocate for patient's' needs.</p> <p>4. Communicating effectively, both verbally and non-verbally, with others taking into consideration individual differences in learning styles, language, and cognitive abilities, etc.</p>  | <p>1[] 2[] 3[] 4[] 5 []</p>                             |

|            |  |   |                      |
|------------|--|---|----------------------|
|            |  | 5. Recognizing and refraining from acting on one's social, cultural, gender and sexual biases.                      | 1[] 2[] 3[] 4[] 5 [] |
|            |  | 6. Embracing the patient's emotional and psychological aspects of care.   | 1[] 2[] 3[] 4[] 5 [] |
|            |  | 7. Attending to the patient's personal needs and comforts.  | 1[] 2[] 3[] 4[] 5 [] |
|            |  | 8. Demonstrating respect for others and considers others as unique and of value.                                    | 1[] 2[] 3[] 4[] 5 [] |
| Excellence | Excellence in radiography practice that consistently uses current knowledge and theory while understanding personal limits, integrates judgment and the patient perspective, challenges mediocrity, and works toward development of new knowledge. | 1. Demonstrating investment in the profession of radiography.   | 1[] 2[] 3[] 4[] 5 [] |
|            |  | 2. Internalizing the importance of using multiple sources of evidence to support professional practice decisions.   | 1[] 2[] 3[] 4[] 5 [] |
|            |  | 3. Participating in integrative and collaborative practice to promote high quality health and educational outcomes. | 1[] 2[] 3[] 4[] 5 [] |
|            |  | 4. Assessing situations, exercising care, discretion and judgment.  | 1[] 2[] 3[] 4[] 5 [] |
|            |  | 5. Demonstrating high levels of knowledge and skill in all aspects of the profession.                               | 1[] 2[] 3[] 4[] 5 [] |
|            |  | 6. Practicing technology founded upon theoretical knowledge and concepts.   | 1[] 2[] 3[] 4[] 5 [] |
|            |  | 7. Using equipment consistent with the purposes for which it was designed.  | 1[] 2[] 3[] 4[] 5 [] |
|            |  | 8. Pursuing new evidence to expand knowledge.   | 1[] 2[] 3[] 4[] 5 [] |
|            |  | 9. Engaging in acquisition of new knowledge throughout one's professional career.                                   | 1[] 2[] 3[] 4[] 5 [] |
|            |  | 10. Sharing one's knowledge with colleagues.  | 1[] 2[] 3[] 4[] 5 [] |
|            |  | 11. Contributing to the development and shaping of excellence in all professional roles.                            | 1[] 2[] 3[] 4[] 5 [] |

|                   |   |   |   |
|-------------------|---|---|---|
| Integrity         | Integrity is steadfast adherence to high ethical principles or professional standards; truthfulness, fairness, doing what you say you will do, and “speaking forth” about why you do what you do.           | <ol style="list-style-type: none"> <li>1. Abiding by the rules, regulations, and laws applicable to the profession.</li> <li>2. Adhering to the highest standards of the profession (scope of practice, ethics, etc.)</li> <li>3. Articulating and internalizing stated ideals and professional values.</li> <li>4. Practicing ethical conduct appropriate to the profession.</li> <li>5. Being trustworthy.</li> <li>6. Taking responsibility to be an integral part in the continuing management of patients.</li> <li>7. Knowing one’s limitations and acting accordingly.</li> <li>8. Confronting harassment and bias among ourselves and others.</li> <li>9. Recognizing the limits of one’s expertise and seeking assistance appropriately.</li> <li>10. Choosing employment situations that are congruent with practice values and professional ethical standards.</li> <li>11. Acting on the basis of professional values.</li> </ol> | <p>1[] 2[] 3[] 4[] 5 []</p> |
| Professional Duty | Professional duty is the commitment to meeting one’s obligations to provide quality radiography services to individual patients, to serve the profession and to positively influence the health of society. | <ol style="list-style-type: none"> <li>1. Demonstrating beneficence by providing “quality patient care”.</li> <li>2. Using techniques appropriately to minimize radiation exposure to the patient, self and other members of the healthcare team.</li> <li>3. Preserving the safety, security and confidentiality of individuals in all professional contexts.</li> <li>4. Being involved in professional activities beyond the practice setting.</li> <li>5. Promoting the profession of radiography.</li> </ol>   | <p>1[] 2[] 3[] 4[] 5 []</p>   |

|                       |   |   |                      |
|-----------------------|---|---|----------------------|
|                       |   | 6. Mentoring others to realize their potential.   | 1[] 2[] 3[] 4[] 5 [] |
|                       |   | 7. Obtaining information for the physician to aid in the diagnosis and treatment of the patient.  | 1[] 2[] 3[] 4[] 5 [] |
| Social Responsibility | Social responsibility is the promotion of a mutual trust between the profession and the larger public that necessitates responding to societal needs for health and wellness. | 1. Advocating for the health and wellness needs of society including access to health care and radiography services.  | 1[] 2[] 3[] 4[] 5 [] |
|                       |   | 2. Promoting cultural competence within the profession and the larger public.   | 1[] 2[] 3[] 4[] 5 [] |
|                       |   | 3. Promoting social policy that effect function, health, and wellness needs of patients.  | 1[] 2[] 3[] 4[] 5 [] |
|                       |   | 4. Ensuring that existing social policy is in the best interest of the patient.   | 1[] 2[] 3[] 4[] 5 [] |
|                       |   | 5. Advocating for changes in laws, regulations, standards, and guidelines that affect the radiology profession.   | 1[] 2[] 3[] 4[] 5 [] |
|                       |   | 6. Promoting community volunteerism.  | 1[] 2[] 3[] 4[] 5 [] |
|                       |   | 7. Participating in political activism.   | 1[] 2[] 3[] 4[] 5 [] |
|                       |   | 8. Participating in achievement of societal health goals.   | 1[] 2[] 3[] 4[] 5 [] |
|                       |   | 9. Understanding of current community wide, nationwide and worldwide issues and how they impact society's health and well-being and the delivery of radiology services. | 1[] 2[] 3[] 4[] 5 [] |
|                       |   | 10. Providing leadership in the community.  | 1[] 2[] 3[] 4[] 5 [] |
|                       |   | 11. Participating in collaborative relationships with other health practitioners and the public at large.   | 1[] 2[] 3[] 4[] 5 [] |
|                       |   | How important is it for our profession to explicitly articulate professional values?  | 1[] 2[] 3[] 4[] 5 [] |

## APPENDIX E

## Permission for Use of Physical Therapy Core Values Self-Assessment



1111 North Fairfax Street  
Alexandria, VA 22314-1488  
703 684 2702  
703 684 7143 fax  
www.apta.org

March 7, 2017

Kelli Haynes, MSRS, RT(R)  
University of Louisiana at Monroe  
c/o Northwestern State University  
1800 Line Ave  
Shreveport, LA 71101  
Email: haynesk@nsula.edu

APTA Request Reference: **APTA 18/17: Professionalism in Physical Therapy: Core Values Self-Assessment**

Dear Ms Haynes:

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An invoice in the amount of \_\_\_\_\_ for use of this material will be issued to \_\_\_\_\_. **Payment must be made within 30 days of receiving the invoice or permission to use the material is revoked.**

The following must be included in the citation: "APTA is not responsible for the translation from English."

Sincerely,

Michele Tillson  
Member Communications Specialist

## APPENDIX F

## Letter of Support



15000 Central Ave. SE, Albuquerque, NM 87123-3909  
505-298-4500 • 800-444-2778 • Fax 505-298-5063 • www.asrt.org

August 8, 2017

To Whom It May Concern:

As the Associate Executive Director of the American Society of Radiologic Technologists (ASRT), I am writing this letter of support for the research to be conducted by Kelli Haynes for her dissertation.

The ASRT will perform the following actions in support of her proposed research:

- Draw a random sample of radiologic technologists from our database.
- Send the survey link via email to that random sample.

We look forward to working with her on this important research topic for the radiologic technology profession.

Sincerely,

A handwritten signature in black ink, appearing to read "Myke Kudlas". The signature is fluid and cursive, with the first name "Myke" being more prominent.

Myke Kudlas, M.Ed., R.T. (R)(QM), CIIP, PMP  
Associate Executive Director

## REFERENCES

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