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## Therapy Dogs and the Impact on Employees in the Pediatric Medical Setting

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## ABSTRACT

More than 40% of nurses reported experiencing significant burnout. Burnout is characterized by disengagement, cynicism, negative views of personal accomplishment and ability, and emotional exhaustion. The healthcare providers that experience burnout can possibly expect a decrease in ability to recognize/report errors, increase of negative feelings toward the patient, and decrease levels of patient satisfaction (Ernest, 2014). One of the ways Schub (2015) suggested to regulate burnout for employees was to provide psychosocial support to colleagues to reduce stress. This study is one of the first attempts to bridge the gap between the unknown correlation between qualitative and quantitative benefits of dog therapy. Our hypothesis is that regular interaction with the therapy dog, will improve employee productivity, job satisfaction, and reduce employees perceived stress. Our research question is “Does regular interaction with a therapy dog positively impact employees?” Although statistical significance was found with regards to the therapy dog’s involvement, the risk of a Type I Error exceeded the number of factors identified. An analysis of the potential factors associated with the findings and limitations of the work will be presented.

Therapy Dogs and the Impact on Employees in the Pediatric Medical Setting

A Thesis

Presented to

The Faculty of the Graduate School (of Social Work)

Abilene Christian University

In Partial Fulfillment

Of the Requirements for the Degree

Master of Science

By

Laine Elise Foith

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This thesis, directed and approved by the candidate's committee, has been accepted by the Graduate Council of Abilene Christian University in partial fulfillment of the requirements for the degree

Master of Science in Social Work



Assistant Provost of Graduate Programs

Date

05/01/2017

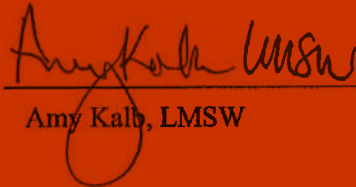
Thesis Committee



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This thesis is dedicated to my family, friends, ACU, and Puffin-whose own positive effects on my stress fueled my desire to participate in this study.

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## CHAPTER I

### INTRODUCTION

On September 1870, George Graham Vest coined the phrase: “man’s best friend” in describing his relationship with his dog (Martin n.d). But it would take another 90 years before relationships between humans and dogs would be described as a complementary therapy. This form of therapy has progressed from subjective to scientific research over the last 90 years (Hooker, Freeman, & Stewart, 2002). There are many approaches to canine use in different fields but more recently, there has been an increased interest for their use in medical settings.

#### **Physical and Emotional Health in the Workplace**

We have known for many years that there is a correlation between emotions and one’s view of how fulfilled they are by their occupation (Ironson, Smith, Brannick, Gibson, & Paul, 1989). In medicine, it is not unusual for employees to work five or six days a week for 40+ hours total. Regrettably, this is more time at work than they will spend at home interacting with their families or friends. And when one considers the hours and sometimes-heartbreaking careers and what they must deal with, this can disrupt physical and emotional health. As one group of researchers suggested, it is not surprising that mood and emotion are predictors of satisfaction with the work itself (Ironson et al., 1989). This suggests the importance of our emotions or feelings about our job can affect our satisfaction, level of stress, and even the stress level of our coworkers.

McTernan, Dollard, & LaMontagne (2013) discuss the stress of our occupation contributing to mental and physical illnesses, like depression. In 2020 depression will be the second leading contributor to global disease. Physically, stress can increase your risk for cardiovascular disease, as well as muscle hypertension and high blood pressure (Vrijkotte, Van Doornen, & De Geus, 2000). The Psychosocial Safety Climate theory is used to explain, describe, and predict how and when work conditions affect psychological health. This puts the employee's physical and mental health as a priority and recognizes the importance of monitoring stress. This increase of awareness of the need for stress-management can benefit employee's mental and physical health, which in turn can lead to job productivity and satisfaction (McTernan, Dollard, & LaMontagne, 2013).

### **Healthcare Occupations and Stress**

In healthcare occupations, the potential for chronic stress level is higher. Schub (2015) reports that more than 40% of nurses reported experiencing significant burnout. Burnout is characterized by disengagement, cynicism, views of personal accomplishment and ability, and emotional exhaustion (Schub, 2015). The healthcare providers that experience burnout can possibly expect a decrease in ability to recognize/report errors, increase of negative feelings toward the patient, and decrease levels of patient satisfaction. One of the ways Schub (2015) suggested to regulate burnout for employees was to provide psychosocial support to colleagues to reduce stress.

CHAPTER II  
LITERATURE REVIEW

**Applying Therapy Dogs**

Ernst (2014) described the history of how facility dogs progressed in the healthcare setting by discoveries made by Florence Nightingale, the founder of modern nursing. In the 1800s, Nightingale did research and discovered the importance of animal-assisted therapy to reduce anxiety in adults and children in psychiatric institutions (Ernst, 2014). Goddard & Gilmer (2015) reported that Dr. Boris Levinson, a child psychologist, was another important researcher in the development of dog therapy. In the 1960's he speculated that his patients had less resistance and less anxiety when his dog, Jingles, was present in the sessions. One of his patients who refused to speak in their sessions would interact and speak with Jingles. The interaction between the patient and Jingles acted as a transitional object to build rapport and facilitate a relationship between Levinson and his patient (Goddard & Gilmer, 2015). These ideas were important in the development and growth of therapy dog programs in healthcare settings.

**Therapy Dogs and Stress**

Bryan, Quist, Young, Steers, Foster, & Lu (2014) believe facility dogs are an asset that can be used to develop staff member's job productivity, lower stress levels, and

job satisfaction. Bryan et al., (2015) went on to report that the support that is given by their pet was comparable to the support system given by other humans. They found that pet owners had lower heart rate, blood pressure, cardiovascular reactivity, and lower stress compared to those without pets. Those who are more receptive to the impact canines may have are those with higher levels of emotional ambivalence rather than those who are more reactive. The authors believe that this is because pets tend to offer non-judgmental social support (Bryan et al., 2014). In other words, those that may have been historically labeled as Type A personality are less likely to be influenced positively by canines. However, for many other personality types, canines were shown to have multiple positive benefits.

### **Therapy Dogs and Attachment Theory**

From a theoretical perspective, there may be some suggestion that emotional attachment could possibly explain the role dogs play in their interaction with humans. One potential explanation for these findings may be found through examination of attachment theory. The theory suggests a social interaction with attachment figures is internalized in the form of mental representations of relationship partners and self (Zilcha-Mano, Mikulincer, & Shaver, 2011). These attachment figures are created and fostered through interactions during times of discomfort, times of need, and when someone needs support (i.e. an attachment made by parents and their children). Researchers have also seen that an attachment bond can be applied to relationships that meet these four criteria: proximity maintenance (how close they are, especially in times of need), using the attachment figure as a safe haven who provides comfort, using this

attachment figure as a secure base who sustains self-development and risk taking, and lastly, one experiences distress when the attachment figure is unavailable. Zilcha-Mano, Mikulincer, & Shaver (2011) argued that the bond between humans and their pets meet the four criteria in the attachment theory and can be seen as attachment relationships.

### **Therapy Dog Attachment Through Neurohormones**

Odendaal and Meintjes (2003) explored the neurobiological changes that occur between humans and dogs and the sense of security that is experienced when around the canine. The researchers could measure a change in the human subject's neurohormones that have been shown to reduce stress and increase feelings of comfort. A decrease in stress would lead to an increase of oxytocin and dopamine, and a lowering of cortisol (Odendaal & Meintjes, 2003).

A decrease in cortisol, or the stress hormone, has the job to mobilize the body to a level of relaxation or calmness to insure a productive response for daily interactions (Hoyt, Zeiders, Ehrlich, & Adam, 2016). When one faces a danger, a potential threat, or stress a fight or flight response is triggered in your brain, releasing norepinephrine and epinephrine. Following these hormones, cortisol is then released. If one continues to have one stress after another, it leads to an outpour of cortisol, which leads to elevated levels of cortisol. This increases cortisol stimulation, can kill brain cells, and reduce the multiplication of new brain cells. Elevated cortisol levels can contribute to lowered immune function, heart disease, and depression (Alban, 2017).

Marazziti (2008) researched the study of oxytocin, or the love hormone in neuropsychiatric disorders, like depression. He discovered that this neurohypophysial

hormone, found only in mammals, acts by maintaining our behaviors. This hormone gets its nickname, “the love hormone”, because it is released during reproduction and breastfeeding. For example, the release of the hormone causes a bond and attachment between a mother and child. Like cortisol, oxytocin is released at times of stress, not by heightening it, but to protect your body so it can maintain a sense of calmness (Marazziti & Dell’Osso 2008).

With an etiology similar to oxytocin, dopamine is the hormone that has the ability to determine our behavior, but through motivation, mood, pleasure, stress, and punishment. Neurologically speaking, Powledge (1999) explained the limbic system as a grouping of brain structures that are gathered around the brain stem. Some of these structures that are centers of cognitive processing are the hippocampus, amygdala and neocortex. The hippocampus is the brain’s hub for memory and learning, the amygdala is the site of our emotional responses to experience, and the neocortex is the center of where our rational thought takes place. All of these structures that make up the limbic system lie closely to the hypothalamus, center of the brain that control hormones that trigger sexual desire, thirst, and hunger. Neurotransmitters, chemicals in the brain, pass messages from one neuron to another across the gaps that divide them. There are more than 100 neurotransmitters in the brain and dopamine is among the most common of them, being about 100,000 nerve cells out of the brain's 100 billion. Dopamine is also the chief neurotransmitter in the brain reward pathway so when it is sent along the axons, it is sent into the synapses.

Powledge's (1990) findings are a direct correlation to the idea Odendaal and Meintjes (2003) had about the increase of dopamine having a high possibility of a positive mood effect, pleasure, and attachment toward what is making their dopamine levels increase, which in this case is the canine.

### **Human-Animal Interaction Studies**

A fairly new phenomenon, human-animal interaction (HAI) studies, is on the rise to examine if there is a positive effect for those with mental, emotional, and physical disabilities (Groomes, Clemons, Hulme, Kort, & Mesilbow, 2014). HAI is defined as “the mutual and dynamic interactions between people and animals and how these interactions may affect physical and psychological health and well-being” (Groomes et al., 2014, p. 166). Research involving HAI began in the 1970s with the greatest emphasis on the animal-assisted interventions. The author believed these interactions are not just mere occurrences with the canine, but like with animal-assisted interventions, it works as a history. The interaction between humans and animals is considered a history of exchanges between two individuals, or animals, with the goal of acquiring a familiarity with each other's behavior and actions (Hosey & Melfi 2014).

### **Therapy Dogs and Veterans**

In 2008, Yount (2012), a certified service dog trainer and social worker, developed the first dog-training program as an intervention to treat symptoms of posttraumatic stress disorder (PTSD) and traumatic brain injury (TBI) in Veterans. He was trying to determine whether PTSD and TBI met criteria for HAI benefit. For



example, PTSD and TBI both can bring about psychological stress, but PTSD is usually the cause of extreme emotional distress and can be the emotional aftermath of being injured or not functioning like they did before. Physically, TBI is recorded as involving severe visual impairments, and PTSD does not (Goodrich, Martinsen, Flyg, Kirby, Garvert, & Tyler, 2014). The etiology of the disorders may differ, but they have similar symptomology. Goodrich et al., define PTSD as a mental health condition that can develop after the exposure of events such as a disaster or assault, and in some cases, war (Goodrich et al., 2014). Goodrich et al., (2014) defines TBI as the trauma-induced structural or physiological disruption of brain function due to an external force. These two conditions are usually paired together when using HAI, specifically with veterans. This is because PTSD and TBI are known as the signature injuries of war (Goodrich et al., 2014). It was found that approximately 40% of Iraq and Afghanistan veterans had been diagnosed with PTSD, depression, and other mental illnesses in the last six years (Yount, Olmert & Lee, 2012). Blast related injuries are up 56-78% of all injuries sustained by the U.S troops and can be a physical damage (TBI) but also mental damage because of the possible trauma associated with the blast (Goodrich et al., 2014). These canine service members and veterans were in a large treatment facility getting medical and psychological help for their brain injuries. The canines used for this program were purpose-bred dogs that were trained from birth to work with service members with PTSD and TBI (Yount, Olmert, & Lee, 2012).

In the Veteran's Administration treatment facility, over 200 service members participated in the Warrior Canine Collection pilot study. This program is used all over the United States whose mission is to reduce PTSD, TBI, and enhance a sense of quality in the staff, families, and veterans. Many of the service members in this pilot study became accredited service dog trainers as a result of this program because of the social and physical benefits of the HAI program. In this study, they did not determine whether the participants used other interventions to treat their brain injuries, except the decrease of pain medication use after the HAI program (Yount et al., 2012).

### **Therapy Dogs and Childhood Sexual Abuse**

One potential area of promise for the use of HAI is in the area of the treatment of childhood sexual abuse (or CSA). This issue is affecting as many as 1 in 7 boys and 1 and 3 girls and can cause a lasting impact psychologically. Since not every sexual abuse case or symptoms are different, a variety of treatments have shown effectiveness with different varieties of people. Dietz, Davis and Pennings (2012), conducted research that evaluated three types of group therapy for CSA victims at a child advocacy center. This was a convenience sample of 153 male and females between the ages of 7-17 years old that were referred to a treatment center had completed group therapy sessions, and a post-trauma symptom inventory. The three types of group therapy involved in this intervention included: no dogs, dogs without introductions, and dogs with introductions.

In group one therapy, the intervention was over 12 sessions and involved topics and activities related to the common barriers survivors must face after sexual assault. In group two, trained therapy dogs visited them once a month, four visits total, during the

survivor's treatment. This group followed the same format as group one but with the addition that the therapy dogs were available to the patients 30 minutes before group therapy and stayed 10-15 minutes into the group introductory time.

Since there was a concern by the therapist of the effectiveness on how the dogs would relate to CSA, the researchers decided to implement group 3, the dogs with introductions, into their research. In group 3, their handlers read relatable and therapeutic stories about the therapy dogs,, to the group to ease conversation about tough topics and to provide structure to the group. The stories were from the dog's perspective and after it was read, the handlers left, and the children were prompted with questions on the topic of the dog's story that mirrored, or were related to, topics that correlated with their abuse (Dietz, Davis, & Pennings, 2012).

Overall the importance of this seminal work was that children who had been sexually abused showed significantly lower depression, anxiety, prevalence of dissociation disorder, anger, PTSD, and sexual concerns compared to children with no dogs (Dietz, Davis, & Pennings, 2012).

### **Therapy Dogs and Autism Spectrum Disorder**

One HAI study explored the potential for canine-human interaction for individuals diagnosed with autism spectrum disorder (ASD) and their ability to acquire social behaviors thorough dog intervention. The U.S Department of Education's Longitudinal Transition Study discovered that approximately 53.4% of 21-25 year olds living with ASD had not worked outside of their home (Groomes, Clemons, Hulme, Kort, Mesilbow, 2014). Their finding that is indicated could be due to earning lower wages and

having a narrower range of employment options. Some of these symptoms include: anxiety, depression, struggle with reciprocal relationships, and sensory sensitivity. For teenagers and adults, social reciprocity is viewed as an important skill needed to start a career and have successful employment (Mazurek & Kanne, 2010). A study by Grooms et al., (2014) assessed ASD-focused interventions to work toward giving those with ASD a quality of life. The mission of the Quality of Life program, and the reason behinds the organization's 40-year dedication, was to help those that are being denied opportunities that make them happy or giving them a feeling of fulfillment (Grooms et al., 2014).

For children with ASD, this is the developmental time when children are to create relationships and develop ways to grow and nurture those relationships. Since this is an issue that could possibly disrupt those with ASD's quality of life, researchers have continued to investigate interventions that address these symptoms.

Animal therapy for those with ASD can be useful to provide nonverbal feedback, just like humans do. One of the issues many ASD individuals struggle with is interpersonal communication. By utilizing the dog's assistance they are able to not only practice on the canine, but through that they have the ability through that to gain independence and psychosocial functioning in the work place or at school (Grooms et al., 2014). Like emotional service dogs, they are also able to calm and comfort the child with autism if they are having a sensory overload. They provide a safe and non-threatening sensory response. Since canines provide reactions to commands and behaviors, this gives those was ASD the chance to learn how to interrupt behavioral and social cues (Grooms et al., 2014). Further, Beetz, Uvnäs-Moberg, Julius, and Kotrschal

(2012) discovered the calming and bonding levels the ASD child experiences with the dog can be due to the release of hormones that scientifically plays apart in attachment and bonding (Pappas, 2015).

When a child with ASD is given a service dog, it is usually given a retriever because of their temperament, size, and trainability (Burrows, Adams, & Millman, 2008). Unlike most canine assistance that leads the individual, the canine accompanying the ASD child is taking commands from a parent or handler (Burrows, Adams, & Millman, 2008). The National Service Dogs Association recommends minimal amount of interaction by the other family members to maintain the focus and loyal relationships between the child and their canine. The bond between the child and the canine assistant is not always a quick bond and can be tricky because the child can give out mixed signals. Many of the dogs bond with the parent of the child, who acts as the dog's second trainer, however, usually the dog will not listen to anyone but the National Service Dogs trainer (Burrows, Adams, & Millman, 2008).

Research involving HAI interventions with ASD students is important in gaining the social reciprocity and quality of life we strive for. In a mixed methods ASD study completed by Stevenson, Jarred, Hinchcliffe, and Roberts (2015), three male students with ASD were assessed with an ADOS-2 assessment (rates levels of ASD symptomatology) prior to the intervention. These three students were specifically chosen for this study based on their diagnosis of ASD, their difficulty engaging in class, limited social interactions, and sensory behaviors. This study took place at a school specifically for children with autism where a teacher or therapeutic assistant assists the children. Each

of the three children took part in five intervention sessions, 20 minutes each, over a 10-week period. Each session was recorded and held in the same room, with the same dog and his toys. During the beginning sessions of the intervention the teacher aid, who was accessible during the whole intervention, was to encourage the child to interact with the dog using a structured plan. In the later weeks, the child was then encouraged to test their sense of control by then choosing how to structure their sessions. Most of the qualitative observations were to first see the gradual increase in interest and engagement with the canine, even without the teacher involved (Stevenson, Jarred, Hinchcliffe, and Roberts, 2015).

After the 10-week intervention, a post ADOS-2 test was administered. When the researcher looked at the observation during the study and the pre/post test for the students it revealed no lower ASD symptoms in student A, but higher rates of interactive play, visual interest, and decreased symptoms of sensory behavior. After the intervention, student A had an increase of verbal interaction. For student B he also did not have lower ASD symptoms, however, during play, it was observed the student had more functionality in his language, eye contact, and more smiling than previous interactions. Student C's ASD symptomatology increased slightly after the post-test which can be linked to the student wanting to be less interactive in the second assessment. In both assessments, the student's sensory interests, ritualistic behavior, and desire to engage impacted the student's capacity to engage in a positive way. When looking at the methodology of this study, one of the limitations viewed was the lack of a control group because it could have made the study and results more significant (Stevenson, Jarred,

Hinchcliffe, & Roberts, 2015). The charts provided in the study did not determine if the findings were significant or not significant.

### **Therapy Dogs and Noncompliant Adolescents**

Not only has HAI shown a positive social and behavioral effects with those on the autism spectrum, noncompliant adolescents have been shown to have behavioral benefits from HAI as well. DeNisco (2016) expressed the positive effect of having therapy dogs in a classroom to act as a behavior management program. Lori Morgan, a teacher who implemented this behavior intervention, saw student's behavior start to change with the addition of the dog. When her students received tokens for good behavior or completing homework, they were able to "buy" time to spend time with the classroom therapy dog. When Morgan became a school counselor, she integrated dog therapy into her sessions and saw ambivalent students start to open up to the dog. This rapport gave Morgan the opportunity to ask the student about their pets, which lead to them opening up about their home life. Morgan would also pose emotional transfer questions, by using the information about the student's dog. She asked questions such as, "how does your dog react to that?" These types of questions furthered students' communication and emotional development process by transferring what they were feeling about home or school onto their dog (DeNisco, 2016).

Schuck, Emmerson, Fine, and Lakes (2015) tested HAI on students with ADHD symptoms such as: a lack of emotional/behavioral regulation, attention, motivation, and irritability. For children with ADHD, it is believed that empathy and perspective cues are an underdeveloped skill. This study developed a cognitive-behavioral group treatment

using canines for students with ADHD. This 12-week intervention used curriculum for social skills and involved the student's parents for behavior modification techniques. The purpose of parents being present for behavior modification was to help teach the parents know how to implement modifications at home. The students were split into two groups: the canine assisted group and the non-canine assisted group. The results of this study showed that both groups decreased in the severity of ADHD symptoms, but the canine group had a significant decline in those symptoms. Additionally, both parent groups reported improvements in their child's social skills and problematic behaviors after the canine and cognitive behavioral intervention (Schuck, Emmerson, Fine, & Lakes, 2013).

### **Therapy Dogs and Diabetics**

When looking at dog assistance programs, not only are canines helpful in their ability to comfort, but they also have the ability to use their senses as a tool for physically impaired humans. Hypoglycemia is a serious complication that can occur with those being treated for diabetes when their glucose levels are too low, but they come with warning signs. If the diabetic fails to consider the first warning signs, the treatment for the diabetic is limited. HAI is important for diabetics because their senses and warning can ultimately save their life (Seewoodhary, Dacruz, Lloyd, & Evans, 2014, p. 323). The alert dogs use their olfactory acuity to detect odorant concentration levels at 1-2 parts per trillion (which is 10,000 times that of human detection) (Seewoodhary, Dacruz, Lloyd, & Evans, 2014, p. 323). Since canines have a highly developed olfactory system at the back of their nasal cavity, unlike humans who have the system in their superior part of their nasal cavity, they are able to sense the lowering glucose levels in humans. The



researchers in this dogs and diabetes detection study explained the science of the canine's nasal cavity by explaining how the architecture of the dog's nasal airway in its nose assists with the forcing of the airflow to the olfactory recess, where it remains inactive until expiration (Seewoodhary, Dacruz, Lloyd, & Evans, 2014, p. 323).

The breed of dog usually used as a diabetes alert dog (DADs) is Labrador, Golden Retriever, and German Shepherd (Seewoodhary, Dacruz, Lloyd, & Evans, 2014). The training for the alert dog is usually 18-24 months starting with scent imprinting (using odor samples of patients that had a hypoglycemic shock), house training, work in public, formal training (DAD tasks that include retrieving glucose monitoring kits), and leash training. Once the alert dog is trained, the owner trains with the dog for two weeks (if it was not already their owner). Since the glucose concentrations shows up in body secretions 15-30 minutes before showing up in the blood, the alert dog in turn detects that and alerts their owner before the he/she has a hypoglycemic attack. When the author's Seewoodhary, Dacruz, Lloyd, and Evans (2014) were researching the effects of dog and diabetes, they discovered that in a survey of 212 dog owners it was found that 65% of these dogs exhibited behavioral reactions to at least one hypoglycemia episode. And 33.6% of owners believed their dog's reactions occurred before they were aware of a hypoglycemic episode.

### **Therapy Dogs and Vision**

Another facet for dogs to use their senses to help humans is canine vision assistance, or a guide dog. The first recorded guide dog was used in Germany during World War I to take care of blinded German soldiers (Ostermeier, 2010). In 1929 in the

U.S created the first guide dog training school called “The Seeing Eye” (Ostermeier, 2010). In regards to visual assistance, the bond between a dog and a vision impaired or blind human is a very different bond than a lot of other service dog to human bonds. Since this is a service that requires being lead everywhere, there is a large amount of trust and training that goes into this relationship. The participants would also be given the opportunity to have nurses accompany them when students and dogs leave the healthcare campus for various training sessions (Olson, 2002). In 1981, the National Academics of Practice (NAP) recognized the need of interdisciplinary teams and support when in healthcare. The NAP has certain requirement that is required for guide dog training regarding legal blindness and physical health (Olson, 2002).

### **Owning a Therapy Dog**

Another aspect of having a guide dog is acknowledging the responsibility that comes with owner-dog training and dog ownership. The study designed by Bruce, Feinstein, Kennedy, and Liu (2015) was created to examine the effect of an eight-week animal- assisted education course on the knowledge and skills of four students with visual impairments. The researchers implemented this case study because they believe that animal-assisted human education courses need to be taught in a way that encourages a student to think realistically about the responsibilities of being a dog owner is, looking past how they will be benefited on a personal level. This HAI created by Bruce, Feinstein, Kennedy, and Liu (2015) involved pre- and post intervention tests, field notes, videotaped observations, and pre-and post intervention interviews. The strategies included assessing prior knowledge and experience with dogs, practicing skills, using

tactile techniques, using routines and repetition, and correcting misconceptions. After the intervention, the findings were determined for individual students and the class as a whole. The results showed the students getting more accustomed to the animals by learning how to greet, feed, and play with the vision dogs, as well as learned about the roles of working vision dogs (Bruce, Feinstein, Kennedy, & Liu, 2015). The barriers associated with receiving a guide dog include financial problems and the health of the owner (Ostermeier, 2010).

### **Therapy Dogs and Mobility**

Regarding assistance dogs for mobility (ADMob), Blanchet, Gagnon, Vincent, Boucher, Routhier, and Martin-Lemoyne (2013) considered whether mobility assistance was beneficial to those with physical disabilities. ADMob's have been used to facilitate several functional activities that need to be physically preformed throughout the day that also benefit the patient's societal participation, without the use of a caregiver (Blanchet et al., 2013). One hundred and ninety-nine participants applied to this study and four timed mobility tests were preformed: ten-meter walk test, TUG test (measures time necessary by an individual to stand-up from an arm chair with their back against the chair, walk 3 meters, turn around, walk back to the chair their normal walking speed, and then sit down), stair ascent test, and lastly the stair descent test. Forty-four of the participants used their assistance dog for mobility and locomotor tasks. After the timed mobility pre-test was accomplished without the ADMobs, the participants retook the mobility test using their ADMobs. According to the results, the majority of the participants (>70.4%) who had functional disabilities and physical impairments significantly increased their

mobility test time, greatly while using their mobility assistance dog (Blanchet et al., 2013).

Regarding diabetes alert dogs and vision assistance canines, dogs' senses are extremely valuable in many different areas. Another area that dogs' olfactory senses are valuable is when they are used to assist servicemen and women to sniff out narcotics and potential bombs (Jackson,Valentin, Freil, Burkeen, Zeagler, Gilliland, & Starner, 2014).

## CHAPTER III

### METHODOLOGY

This study is a qualitative exploratory pilot study where we proposed to deliver a questionnaire to the staff in each ambulatory clinic in The Children's Health Specialty Center. The Specialty Center is located in Dallas, Texas. Children's Health received their first two facility dogs in November 2014 and currently have seven dogs total in the Children's Dallas and Plano campuses. One of those dogs has been in the Endocrinology clinic, and casual observations suggest that this has resulted in an overall improvement in staff morale and productivity. Our study seeks to identify the effects of regular contact with the therapy dog, bridge the gap between qualitative and quantitative studies about dogs, and evaluate more specifically the dog's impact on staff morale, perceptions, and stress.

The literature suggests that dogs produce a beneficial impact in their interaction with humans. However, most of the results do not specifically address the potential benefits for employee interaction with a (therapy or facility) dog in the workplace. The purpose of this research is to qualitatively evaluate the potential impact of dogs in medical settings, and their influence on those they encounter.

## **Setting**

The Gastroenterology (GI), Plastics, Cystic Fibrosis (CF), Neurology, and Urology clinics are located in the Children's Health Specialty Center. In the individual clinics, the tests were administered to those working in the clinic itself and the clinic's office area to get a wide range of healthcare professionals.

## **Sample**

The participants involved in this study were an average of 10-25 employee healthcare professionals per clinic at Children's Health Dallas and UT Southwestern. The participants were healthcare professionals in five different clinics at Children's Health Specialty Center: Gastroenterology (GI), Plastics, Cystic Fibrosis (CF), Neurology, and Urology. The CF clinic is our control group, so they did not receive the intervention. There were 74 total participants.

## **Procedure**

Before the intervention, the investigators requested permission from the clinic's Practice Administrators to administer questionnaires to staff in their clinic. Practice Administrator's were informed of the intervention and were provided with general information regarding the use of Keaton, the facility dog, in the intervention. They investigators informed the Practice Administrators that the intervention was a blind study so information regarding the intervention cannot be shared with the staff. The researchers administered the questionnaire to the first clinic in our intervention group. With our control group, the questionnaire was administered during the first week of the study as well. After the pretest was administered, the certified handlers for Keaton, the two researcher investigators, took Keaton to the clinic for a minimum of 15 minutes and a

maximum of 30 minutes daily for one week. The two handlers went to the clinic alternate days to minimize any impact a specific handler may have on the results.

Following the intervention, the co-investigator administered the same questionnaire to staff in that clinic (the post-test) the week after their intervention. The post-test questionnaire was administered to the control group (the Cystic Fibrosis clinic) at the same time it was given to the first intervention group. The control group was not randomized because the participants' pretest answers were coded to line up with the participants' posttest answers. The questionnaire focused on employee reports (perceptions) of stress, job satisfaction, and productivity.

### **Materials**

For all intervention groups the co-investigator administered the 15-rating scale questionnaire (appendix C), developed by the two investigators in this study one week prior to the intervention. On the top of the questionnaire, there were also two demographic questions that asked the participants to put their occupation and years of service at Children's Health Dallas. Informed consent was implied by voluntary participation and when the staff member completed the initial questionnaire. Staff were informed prior to the start of the study that they could withdraw at any time without penalty by ceasing their participation. Staff participation was requested but not required. Staff was made aware that responses to the questionnaires would not affect their job or positions at Children's Medical Center. Questionnaire information was printed at the bottom of each questionnaire for reference and they were labeled by clinic and if they

were the pre or post survey, with participants assigned to a number (ex: GI\_Pre1, PMR\_Post2, etc.). A key was kept separately from the time of pre-test to post-test to ensure coding that both tests correlated with each participant. The key was kept in a locked drawer in the Endocrinology Clinic. The key was shredded at the completion of the study. This allowed for comparison between pre-and post questionnaire answers and protects anonymity.

### **Analysis**

For data analysis, we used Microsoft Excel to create a codebook (Appendix B) for the participants, their clinic (ex: GI\_Pre1, PMR\_Post2, etc.), and how they scored on their pre/post survey. We used the latest version of SPSS to determine if there were correlated results from the pre-and posts tests to determine if our intervention with Keaton positively impacted employees specifically in the areas of job productivity, stress reduction, and employee satisfaction. The investigators and co-investigator ran a variety of tests (Wilcoxon Rank Test, paired samples T-test, crosstabs, and frequencies) using the pretest and post-test data collected and discovered statistical and clinical significance. In the clinical setting, a p-score, or 2-tailed significance, that is  $<0.10$  is considered “clinically significant” opposed to “statistically significant” at  $<.05$ .



## CHAPTER IV

### RESULTS

A total of 74 healthcare professionals participated in this study. We ran a frequency test on the demographics of our study, which included the number of participants by clinic and occupation. In the clinics that participated, there were 20 in Neurology (27.0%), 17 in Plastics (23.0%), 12 in Urology (16.2%), 12 in Gastroenterology or GI (23.0%), and there were 8 participants (10.8%) in our control group Cystic Fibrosis (CF). Out of the participants by occupation, there were 25 nurses (33.8%), 8 providers (10.9%), 19 Ambulatory Service Representatives, or ASRs (25.7%), and 22 in our “other” category (29.9%) (see Table 1). The category of “other” included: Dietitians, Genetic Counselors, Respiratory Therapists, Photo Technicians, Social Workers, Lab Technicians, and Medical Assistants. This decision to group these occupations as “other” was because some of them were not staffed in all of the clinics. The category providers included: MDs, Physicians Assistants, and Nurse Practitioners. The same rationale was used because of a lack of availability in all clinics.

Table 1

*Participant Demographics*

<b>Variable</b>	<b>Total Sample</b>	<b>%</b>
<u>Years of Service</u>	377 years total	Mean: 6.01 years
<u>Clinics</u>	<u>n=74</u>	
Neurology	20	27.0%
Plastics	17	23.0%
Urology	12	16.2%
Gastroenterology	12	23.0%
Cystic Fibrosis	8	10.8%
<u>Profession</u>	<u>n=74</u>	
Nurse	25	33.8%
Provider	8	10.9%
ASR	19	27.7%
Other	22	29.9%

Another frequency test was run to determine participant's years of service by profession. Out of the 74 participants, there was a total of 377 accumulated years worked at Children's health with a mean of 6.01 years (see Table 2). The researcher ran a correlation to determine if job satisfaction, stress level, and employee productivity was associated with years of service (data not shown). There was no significance found with these comparisons.

Table 2

*Mean Years by Profession*

<b>Profession</b>	<b>Mean Years</b>
Nurse	6.36
Provider	6.25
ASR	5.89
Other	5.64
Total	6.01

The 15 variables that were included in the pre and post test survey were questions that were formed to symbolize and characterize the three areas of interest, employee productivity, stress, and job satisfaction after the intervention involving a facility dog.

A pair-samples t-test was run to determine the significance of our study between our control group (CF clinic) and our intervention groups (GI, Plastics, Urology, and Neurology.) We looked at the significant 2-tailed test to determine if there was any significance to show the intervention had measurable differences. The data in the paired samples 2-tailed test determined that the intervention group reported less physical signs of stress ( $p < .047$ ) following the intervention compared to our control group that did not receive the intervention.

Table 3

*Independent samples T-Test: Intervention and Control*

Clinic	Survey Question	Pretest Mean	Posttest Mean	2-tailed
Intervention	Less Physical Signs of Stress	3.57	3.77	0.047*
Control (CF Clinic)	Less Physical Signs of Stress	.000	.000	N/S

*Note. \*  $\leq 0.05$  statistically significant/ \*\*  $\leq 0.10$  clinically significant*

Another aspect of our analysis was to determine clinically if the intervention with the facility dog plays a role on the pre and post tests with the individual clinics. As indicated in the analysis section, the author makes a distinction between clinical and

statistical significance. In the Neurology clinic, there was a statistical significance in the survey statement of, “I am able to leave work feeling accomplished” with a of  $p < .021$ . There was clinical significance found in Neurology, Urology, and Plastics. It ranged from 6 – 10%.

Table 4

*Paired Sample t-test Intervention by Clinic*

Clinic	Survey Question	Pretest Mean	Posttest Mean	2-tailed
Neurology	Leave Work Feeling Accomplished	4.6	4.85	0.021*
	No Physical Signs of Stress	4.25	4.5	0.056**
Urology	Used Up at the End of the Day	5.25	4.83	0.096*
Plastics	Stress Level is Manageable	5.22	5.06	0.083**
Gastroenterology	-	-	-	N/S

*Note.* \*  $\leq 0.05$  statistically significant/ \*\*  $\leq 0.10$  clinically significant

A pair-samples t-test was run to determine if there was significance change between the pre and post test intervention results concerning job satisfaction, stress management, and employee productivity by profession. The data was analyzed to determine whether the intervention was effective to certain professions in a healthcare setting. Within the nursing occupation, the t-test determined there was statistical significance regarding the survey questions: “I feel that staff morale is usually high” ( $p < 0.05$ ) and the statement, “My overall mood at work is positive” ( $p < 0.009$ ).

In the “other” category, there was a statistical significance regarding the survey questions, “I feel happy when I am at work” ( $p<.015$ ) and the statement, “I do not have physical signs of stress while at work” ( $p<0.025$ ). The providers and ASR profession did not have significance.

Table 5

*Pair-sampled T-Test: Pre/Post Tests by Profession*

Profession	Survey Subject	Pretest Mean	Posttest Mean	2-tailed
Nursing	Staff Morale	3.86	3.55	$p<0.05^*$
	Overall Mood	4.27	3.86	$p<0.009^*$
Other	Happy at Work	3.7	4.05	$p<0.015^*$
	No Physical Signs of Stress	3.4	3.85	$p<0.025^*$
Providers	-	-	-	N/S
ASR	-	-	-	N/S

*Note.*  $* \leq 0.05$  statistically significant/  $** \leq 0.10$  clinically significant

A Wilcoxon Rank Sum test was run to determine the frequency of the 15 variables and compare the results of the pre-and post tests. This helped to validate or evaluate chance of Type I Error found with multiple T-tests. Our findings indicated that there was clinical significance with the survey question of “Less physical stress at work” with a 2-tailed score of  $p<0.06$ . In the categories of “Pride for work” and “Overall happiness at work”, it was very close to a 2-tailed significance. The happy at work survey question mirrors the significance found in the “other” profession. This suggests and helps to support the notion that the risks of Type I Error were potentially overstated.

Table 6

*Wilcoxon Rank Sum Test*

<b>Survey Question</b>	<b>Mean Negative Rank</b>	<b>Mean Positive Rank</b>	<b>Sig.</b>
Look Forward to Work	-	-	N/A
Happy at Work	15	15	p<0.194
Happy with Coworkers	-	-	N/A
Staff Morale	-	-	N/A
Pride in Work	8.5	8.5	p<0.134
Overall Mood	-	-	N/A
Stress Level is Manageable	-	-	N/A
Used Up at the End of the Day	-	-	N/A
Physical Signs of Stress	14	15.53	p<0.06**
Manage Stress	-	-	N/A
Workload Manageable	-	-	N/A
Handle Workload	-	-	N/A
Inspired by Work	-	-	N/A
Leave On Time	-	-	N/A
Leave Work Feeling Accomplished	-	-	N/A

*Note. \* ≤ 0.05 statistically significant/ \*\* ≤ 0.10 clinically significant*

It was determined that this study had a significant risk for a Type I Error. A Type I Error occurs with one rejects the null hypothesis and is predetermined by the significance level of the results. To determine the probability of a Type I Error, the 2-tailed t-tests were analyzed and set at an alpha value of 0.05. Based on the significance level of  $p < 0.05$ , total the number of t-test comparisons and multiply to find the risk of a Type I Error. When that is done, the risk of making a Type I Error is 1650% (data not shown). This suggests that all significant tests were probably a false positive and that there were no significant findings from the data.

## CHAPTER V

### DISCUSSION

The author was a co-investigator assisting researchers with a previous project they had developed before serving as a Children's Hospital Intern. The tool and overall structure of the work itself was previously created and it was the author's responsibility to administer the surveys and conduct data analysis.

It was very disheartening to find that the preliminary statistical analysis suggests that the risk of making a Type I Error was greater than the significance that was found. However, this does not mean that this work is lacking in relevance or importance. A firm decision of the relevance of the initial analysis may be due to the individual statistical procedures used themselves, or an inherent problem with the research tool lacking sensitivity to measure the concepts that the researchers attempted to explore.

Although there is a greater chance for a Type I Error than significance found, one may assume that the error may be a statistical anomaly and that the literature findings are consistent with the significance that was in the study. This, in, turn raises the question of relevance of the study's Type I Error. In the analysis of this study, there was statistical significance with the decrease of physical signs of stress, overall mood, happiness at work, and staff morale. This created a foundation for developing an even stronger study when working with other clinics in the future and provided more literature on the benefits



of dog interaction for healthcare professionals. There was a non-significant correlation between the ASR's, providers, and the intervention's positive effect on their job productivity, stress management, and job satisfaction. There was also a non-significant correlation between the intervention and the CF, GI, Plastics, and Urology clinics. This could be due to professionals not being in the office or clinic the week of the intervention, or being present for the pre test but not the post test. In our study, there were three healthcare professionals that decided not to participate.

However, there was statistical significance in the relationship found between the intervention and the positive benefits felt by the nurses and the "other" professions, our two largest groups of participants. The significance in these professionals could possibly be greater because is a total of eight different professions among 47 different people. Schub (2015) reported those in the healthcare occupation could have a greater potential for chronic stress, compared to other occupations. More specifically, it is reported that more than 40% of nurses reported experiencing significant burnout. The results illustrate that after the intervention, the nursing occupation showed the most significance regarding job satisfaction, productivity, and stress management than the other occupations in our study. This intervention supported Schub's (2015) statement suggesting regulation and psychosocial support to prevent burnout and reduce healthcare employees' stress levels. This variety of people from 8 different professions could cause significance due to the difference in employee's personality types, work environment, temperament, work hours, and coworkers when relating to the intervention.

There was also a statistical significance for a decrease in physical signs of stress in the intervention groups, opposed to non-significance in the control group (CF clinic),

who did not receive the intervention. These results correlated with the literature describing not only benefits of dogs in the workplace, but having less physical signs of stress with canine intervention. For physical stress, this can go back to what Bryan et al., (2014) reported which was finding that pet owners had lower heart rate, blood pressure, cardiovascular reactivity, and lower stress compared to those without pets. This significance between less physical stress with the intervention versus the control provides an insight to possible positive results on physical stress with just seeing Keaton for 30 minutes, for 5 days. This was also true in Wilcoxon Rank Sum t-test. It was found that there was clinical significance on the survey subject “less physical signs of stress at work” with a score of  $p > 0.06$ . In the survey questions about the participants’ pride in their work and happiness at work, their t-test was extremely close to being significant. This also supports the idea that there may not be a Type I Error.

If one assumes that the risk for a Type I Error is greater than the significance found, there may be an inconsistency on how the intervention was measured. One of the possibilities of the study having been inconsistent with the literature could be the development of the survey used and how it identified questions related to employee satisfaction, stress management, and job productivity. Because most of the studies that were in the literature were observational and lacking objectivity, this could have been another factor of credible significance. This study is one of the first to attempt to quantify and give an objective measure of potential results of dog therapy.

Our study was based on a qualitative, close-ended survey and this could have affected the participants’ reactions of the open-ended observations. Since we could not

analyze based on the participants' specific feelings or what we observed when they were interacting with the dog, it could have hindered the outcome of our result's significance since our survey was based on 15 close-ended set questions. The possibility that our research could not relate to the literature makes us question the potential for pseudoscience.

Thyer and Pignotti (2015) define pseudoscience as, "the use of trappings of science without the substance" (p.4). This research pairs pseudoscience with the importance for social workers to not focus on interventions that do not have credible evidence of scientific support that will benefit the client. Some of these interventions that have been used by social workers in the past have been reported as harmful to the clients. The authors view this as a large problem and desire to create a trend with social workers to become adamant about evidence based research that is proven to positively benefit the client. By having the social workers participate in evidence-based research, we not only have the ability to give our client the best practice but gain credibility with other professions and their level of research. The importance Thyler and Pignotti (2015) place on the use of beneficial interventions is thought to start in our education of future social workers, by instilling the skills of critical thinking and transparency. The skill of transparency gives the social worker the foundation of social work knowledge (i.e. what we are trained to do) and to what effect we fulfill our duties. By having the critical thinking skill, we are able to recognize bias in our own thinking and our ability to recognize the difference between science and pseudoscience. Thyler and Pignotti (2015) pressed on the idea of critically thinking when reading someone's research, no matter

who the researcher is. By critically thinking, it rules out vagueness that may hinder susceptible clients. Even if criticism is the way one reads possible interventions, then the social worker is viewed as seeing truth and effective interventions as a priority. The author's make a point of talking about avoiding the tendency to only search for data that confirm our views and data that does not require seeking evidence against our preferential views.

The importance of avoiding pseudoscience is one of the reasons the author decided to combine quantitative reasoning to research that is mostly based on qualitative research. By using a survey to analyze the data, we were able to collect quantitative evidence on the effects of dog therapy. Because there is a lack of real evidence involving the literature, our study is an early attempt to remedy the problem of pseudoscience in the Social Work profession.

### **Limitations**

There were multiple limitations to this study so the findings should be reviewed with care. The first limitation was our decision to leave the Physical Medicine and Rehabilitation (or PM&R) clinic out of our study. This was due to permission and scheduling conflict. The PM&R clinic may be part of the future implications of this study when we extend this intervention to other clinics.

A limitation we had was some participants were present for the post test, but not for the pre test. Similarly, some participants were present for the pre and post test, but not for the intervention. A lot of the participants' absence was due to the fact that many of these surveys were administered during the holiday season. We also must take into

account the time of year the tests were administered. The Thanksgiving and Christmas season could have heightened stress levels in our participants. These limitations may have caused a validity concern to the end results of the intervention.

A strength of our study was the positive reaction when seeing Keaton, although it was unknown to the participants that this was the intervention. The investigator's that took Keaton to the clinics were greeted by healthcare professionals, some being participants, that wanted to pet and love on Keaton. Many of the clinics stated that they would love to see Keaton in their clinic more often.

### **Future Implications**

This study's findings prompted the researchers to become eager to use this study in the future using other clinics at Children's. When observing our results for this study, we discussed administering the post-test at the end of the week after the intervention for our future research to possibly discover more of a significant impact. Another future implication is to make our research more of a longitudinal study instead of the intervention lasting 5 days. In turn, this would help us determine the duration of the intervention effect.

We would also reevaluate how we want to measure stress management, job productivity, and employee satisfaction. We were able to find positive findings through observation and individual surveys but when we analyzed the surveys, the significance told us the findings were not consistent with a reliable study (Type I Error). The scale created possibly limited our ability to report or discover significant findings because they

were not tailored to the 15-question survey. In the future, we would want to tighten up the survey or use methodology another researcher used to do a replication study.

### **Conclusion**

This qualitative exploratory pilot study started as project of interest and developed into a learning instrument on the possible benefits of human-animal interaction, specifically with dogs in the healthcare setting. In this study, all of the significant findings are considered the “risk range.”

## REFERENCES

- Alban, D. (2017, February 23). How to reduce cortisol, the stress hormone. Retrieved February 24, 2017, from <https://bebrainfit.com/reduce-cortisol-stress-hormone/>
- Beetz, A., Uvnäs-Moberg, K., Julius, H., & Kotrschal, K. (2012). Psychosocial and psychophysiological effects of human-animal interactions: The possible role of oxytocin. *Frontiers in Psychology*, 3(234), 1-15. doi:10.3389/fpsyg.2012.00234
- Blanchet, M., Gagnon, D. H., Vincent, C., Boucher, P., Routhier, F., & Martin-Lemoyne, V. (2013). Effects of a mobility assistance dog on the performance of functional mobility tests among ambulatory individuals with physical impairments and functional disabilities. *Assistive Technology*, 25(4), 247-252. doi:10.1080/10400435.2013.810183
- Bruce, S., Feinstein, J., Kennedy, M., & Liu, M. (2015). Humane education for students with visual impairments: Learning about working dogs. *Journal of Visual Impairment & Blindness*, 279-289. Retrieved from [www.afb.org/jvib/jvibabstractNews.asp?articleid=jvib090404](http://www.afb.org/jvib/jvibabstractNews.asp?articleid=jvib090404)
- Bryan, J. L., Quist, M. C., Young, C. M., Steers, M. N., Foster, D. W., & Lu, Q. (2014). Canine comfort: Pet affinity buffers the negative impact of ambivalence over emotional expression on perceived social support. *Personality and Individual Differences*, 68, 23-27. doi:10.1016/j.paid.2014.04.003

- Burrows, K. E., Adams, C. L., & Millman, S. T. (2008). Factors affecting behavior and welfare of service dogs for children with autism spectrum Disorder. *Journal of Applied Animal Welfare Science, 11*(1), 4262. doi:10.1080/10888700701555550
- DeNisco, A., & Pascopella, A. (2016, March 18). Canines in the classroom. *District Administration*. Retrieved from <https://www.districtadministration.com/article/canines-classroom>
- Dietz, T. J., Davis, D., & Pennings, J. (2012). Evaluating animal-assisted therapy in group treatment for child sexual abuse. *Journal of Child Sexual Abuse, 21*(6), 665-683. doi:10.1080/10538712.2012.726700
- Ernest, L. (2014). Animal assisted therapy: An exploration of its history, healing benefits, and how skilled nursing facilities can set up programs. *Annals of Long-Term Care: Clinical Care and Aging, 22*(10), 27-32. Retrieved from [www.managedhealthcareconnect.com/article/animal-assisted-therapy-exploration-its-history-healing-benefits-and-how-skilled-nursing](http://www.managedhealthcareconnect.com/article/animal-assisted-therapy-exploration-its-history-healing-benefits-and-how-skilled-nursing)
- Goddard, A. T., & Gilmer, M. (2015). The role and impact of animals with pediatric patients. *Pediatric Nurses: Continuing Nursing Education, 41*(2), 65-71. Retrieved from <https://www.pediatricnursing.net/ce/2017/article41026571.pdf>
- Goodrich, G. L., Martinsen, G. L., Flyg, H. M., Kirby, J., Garvert, D. W., & Tyler, C. W. (2014). Visual functioning, traumatic brain injury, and posttraumatic stress disorder. *Journal of Rehabilitation Research and Development, 51*(4), 547-558. doi:10.1682/JRRD.2013.02.0049



- Groomes, D., Clemons, A., Hulme, S., Kort, K., & Mesilbow, G. (2014). Utilizing assistive dogs in integrated employment settings: Multidisciplinary elements to consider for individuals with ASD. *Journal of Vocational Rehabilitation, 40*, 165-173. doi:10.3233/JVR-140674
- Hooker, S. D., Freeman, L. H., & Stewart, P. (2002). Pet therapy research: A historical review. *Holistic Nursing Practice, 17*(1), 17-23. Retrieved from [http://journals.lww.com/hnpjjournal/Abstract/2002/10000/Pet\\_Therapy\\_Research\\_A\\_Historical\\_Review.6.aspx](http://journals.lww.com/hnpjjournal/Abstract/2002/10000/Pet_Therapy_Research_A_Historical_Review.6.aspx)
- Hosey, G., & Melfi, V. (2014). Human-animal interactions, relationships and bonds: A review and analysis of the literature. *International Journal of Comparative Psychology, 27*(1), 1-29. Retrieved from <http://escholarship.org/uc/item/6955n8kd>
- Hoyt, L. T., Zeiders, K. H., Ehrlich, K. B., & Adam, E. K. (2016). Positive upshots of cortisol in everyday life. *Emotion, 16*(4), 431-435. doi: 10.1037/emo0000174
- Jackson, M. M., Valentin, G., Freil, L., Burkeen, L., Zeagler, C., Gilliland, S., Starner, T. (2014). FIDO—Facilitating interactions for dogs with occupations: Wearable communication interfaces for working dogs. *Personal and Ubiquitous Computing, 19*(1), 155-173. doi:10.1007/s00779-014-0817-9

- Ironson, G.H., Smith, P.C., Brannick, M.T., Gibson, W.M., & Paul, K.B. (1989). Construction of a job in general scale: A comparison of global, composite, and specific measures. *Journal of Applied Psychology* 74, 193-200.  
doi:10.1.1.454.9646
- Marazziti D, Catena Dell'Osso M. (2008). The role of oxytocin in neuropsychiatric disorders. *Current Medicinal Chemistry*. 2008;15(7):698-704.  
Retrieved from <https://www.ncbi.nlm.nih.gov/pubmed/18336283>
- Martin, G. (n.d.). The meaning and origin of the expression: Man's best friend.  
Retrieved from [www.phrases.org.uk/meanings/mans-best-friend.html](http://www.phrases.org.uk/meanings/mans-best-friend.html)
- Mazurek, M. O., & Kanne, S. M. (2010). Friendship and internalizing symptoms among children and adolescents with ASD. *Journal of Autism and Developmental Disorders*,40(12), 1512-1520.doi:10.1007/s10803-010-1014-y
- Mcernan, W. P., Dollard, M. F., & LaMontagne, A. D. (2013). Depression in the workplace: An economic cost analysis of depression-related productivity loss attributable to job strain and bullying. *Work & Stress*,27(4), 321-338.  
doi:10.1080/02678373.2013.846948
- Odendaal & Meintjes R.A. (2003). Neurophysiological correlates of affiliative behavior between humans and dogs. *Veterinary Journal*. 2003;165(3):296-301.  
doi: 10.1016/S1090-0233(02)00237

- Olson, P. (2002). The modern working dog—a call for interdisciplinary collaboration. *JAVMA*, 221(3). doi: 10.2460/javma.2002.221.352
- Ostermeier, M. (2010). History of guide dog use by veterans. *Military Medicine*, 175(8), 587th ser., 587-593. Retrieved from <http://militarymedicine.amsus.org/doi/pdf/10.7205/MILMED-D-10-00082>
- Pappas, S. (2015). Oxytocin: Facts about the 'cuddle hormone' Retrieved from [www.livescience.com/42198-what-is-oxyocin.html](http://www.livescience.com/42198-what-is-oxyocin.html)
- Powledge, T. M. (1999). Addiction and the brain: The dopamine pathway is helping researchers find their way through the addiction maze. *Bioscience*, 49(7), 513-519. doi: 10.2307/1313471
- Schub, T. (2015). Job stress and burnout in nurses. *Evidence-based Care Sheet*, 1-3. Retrieved from [www.ebscohost.com/assests-sample-content/SWRC-EBCS\\_Case\\_Management\\_in\\_the\\_ED.pdf](http://www.ebscohost.com/assests-sample-content/SWRC-EBCS_Case_Management_in_the_ED.pdf)
- Schuck, S. E., Emmerson, N. A., Fine, A. H., & Lakes, K. D. (2013). Canine-assisted therapy for children with ADHD: Preliminary findings from the positive assertive cooperative kids study. *Journal of Attention Disorders*, 19(2), 125-137. doi:10.1177/1087054713502080
- Stevenson, K., Jarred, S., Hinchcliffe, V., & Roberts, K. (2015). Can a dog be used as a motivator to develop social interaction and engagement with teachers for students with autism? *Support for Learning*, 30(4), 341-363. doi: 10.1111/1467-9604.12105

- Seewoodhary, J., Dacruz, T., Lloyd, E., & Evans, P. (2014). The role of diabetic alert dogs in the management of impaired hypoglycemia awareness. *Practical Diabetes*, 31(8). Retrieved from [www.practicaldiabetes.com/wp-content/uploads/sites/29/2016/03/The-role-of-diabetic-alert-dogs-in-the-management-of-impaired-hypoglycaemia-awareness.pdf](http://www.practicaldiabetes.com/wp-content/uploads/sites/29/2016/03/The-role-of-diabetic-alert-dogs-in-the-management-of-impaired-hypoglycaemia-awareness.pdf)
- Thyer, B. A., & Pignotti, M. (2015). *Science and pseudoscience in social work practice*. New York: Springer Publishing Company.
- Vrijkotte, T. G., Van Doornen, L. J., & De Gues, E. J. (2000). Effects of work stress on ambulatory blood pressure, heart rate, and heart rate variability. *Hypertension: A Journal of the American Heart Association*, 35, 880-886.  
doi:10.1161/01.HYP.35.4.880
- Yount, R. A., Olmert, M. D., & Lee, M. R. (2012). Service dog training program for treatment of posttraumatic stress in service members. *The Army Medical Department Journal*, 63-69. Retrieved from [www.cs.amedd.army.mil/FileDownloadpublic.aspx?docid=73e8d2aa-1a2a-467d-b6e3-e73652da8622](http://www.cs.amedd.army.mil/FileDownloadpublic.aspx?docid=73e8d2aa-1a2a-467d-b6e3-e73652da8622)
- Zilcha-Mano, S., Mikulincer, M., & Shaver, P. R. (2011). An attachment perspective on human–pet relationships: Conceptualization and assessment of pet attachment orientations. *Journal of Research in Personality*, 45, 345–357. doi: 10.1016/j.jrp.2011.04.001

Zilcha-Mano, S., Mikulincer, M., & Shaver, P. R. (2012). Pets as safe havens and secure bases: The moderating role of pet attachment orientations. *Journal of Research in Personality, 46*(5), 571-580. doi:10.1016/j.jrp.2012.06.005

# APPENDIX A

## IRB Approval Letter

DocuSign Envelope ID: C9FBFFB8-B622-4E5B-A87B-205143BCBBD5

Version Date: 04/6/2015

### Institutional Review Board (IRB) Authorization Agreement

**Name of Institution or Organization Providing IRB Review (Institution A):**  
University of Texas Southwestern Medical Center

IRB Registration #: IRB00000974, IRB00000975, IRB00000976, IRB00003142

Federalwide Assurance #: FWA00005087

**Name of Institution Relying on the Designated IRB (Institution B):**  
Abilene Christian University

FWA #: FWA00009869

The Officials signing below agree that Abilene Christian University may rely on the designated IRB for review and continuing oversight of its human subjects research described below: (check one)

This agreement applies to all human subjects research covered by Institution B's FWA

This agreement is limited to the following specific protocol(s):

Name of Research Project: Therapy Dogs and the Impact on Employees in the Medical Setting  
STU 102016-053

Name of Principal Investigator: Bonnie B. Jenkins, LCSW

Sponsor or Funding Agency: Internal-Departmental- UT Southwestern Medical Center

Other (describe): \_\_\_\_\_

The review performed by the designated IRB will meet the human subject protection requirements of Institution B's OHRP-approved FWA. The IRB at Institution A will follow written procedures for reporting its findings and actions to appropriate officials at Institution B. Relevant minutes of IRB meetings to Institution B upon request. Institution B remains responsible for ensuring compliance with the IRB's determinations and with the Terms of its OHRP-approved FWA. This document must be kept on file by both parties and provided to OHRP upon request.

Signature of Signatory Official (Institution A): Angela Wishon Date: 5/7/2017 | 1:29 PM CDT

Print Full Name: Angela R. Charboneau Wishon, J.D.  
Institutional Title: Vice President for Research Administration

Signature of Signatory Official (Institution B): Susan Lewis Date: May 9, 2017

Print Full Name: Susan Lewis Institutional Title: Vice Provost

## APPENDEX B

### Children's IRB Approval

Page 1 of 2

**UT Southwestern**  
Medical Center

**eIRB System**

From: Scott Roberts  
Institutional Review Board Chairperson  
IRB - 8843

To: Bonnie Jenkins

Date: Friday, November 11, 2016

Re: Study Approval

IRB Number: STU 102016-053

Title: Therapy Dogs and the Impact on Employees in the Pediatric Medical Setting

Documents: Protocol and all smart form attachments

The UT Southwestern Institutional Review Board (IRB) reviewed the above-referenced research study via an expedited review procedure on Wednesday, November 09, 2016 in accordance with 45 CFR 46.110(a)-(b)(1). Having met all applicable requirements, the research study is approved for continuation for a period of 12 months. The approval period for this research study begins on Thursday, November 10, 2016 and lasts until Wednesday, November 08, 2017 .

**Documentation of consent was waived in accordance with 45 CFR 46.117(c).**

**Having met all regulatory criteria outlined in 45 CFR 164.512, the IRB also approved a waiver of authorization for the release of protected health information for this study.**

The research study cannot continue beyond the approval period without continuing review and approval by the IRB. In order to avoid a lapse in IRB approval, the Principal Investigator must apply for continuing review of the protocol and related documents before the expiration date. A reminder will be sent to you approximately 90 days prior to expiration of research study approval.

The approved number of subjects to be enrolled is 300 . The IRB considers a subject to be enrolled once s/he verbally agrees to participate in the study. If additional subjects are needed, you first must obtain permission from the IRB to increase the sample size.

If you have any questions related to this approval letter or about IRB policies and procedures, please telephone the IRB Office at 214-648-3060.

<https://eresearch.swmed.edu/eIRB/Doc/0/FOR9EQHQ05KKJ2CHJT71JMQ7F4/fromStri...> 12/8/2016

## APPENDEX C

### Pre and Post Test Survey

	Strongly Disagree				Strongly Agree
1. I look forward to coming to work.	1	2	3	4	5
2. I feel happy when I am at work.	1	2	3	4	5
3. I feel glad to work with my coworkers.	1	2	3	4	5
4. I feel that staff morale is usually high.	1	2	3	4	5
5. I am proud to work for Children's Health.	1	2	3	4	5
6. My overall mood at work is positive.	1	2	3	4	5
7. My stress level is manageable.	1	2	3	4	5
8. I do not feel "used up" at the end of the day.	1	2	3	4	5
9. I do not have any physical signs of stress while at work.	1	2	3	4	5
10. My coworkers manage their stress well.	1	2	3	4	5
11. I feel that my workload is manageable.	1	2	3	4	5
12. I usually feel like I have a handle on my workload.	1	2	3	4	5
13. I feel that my work is inspiring and stretches my abilities.	1	2	3	4	5
14. I finish my work without having to stay late.	1	2	3	4	5
15. I am able to leave work feeling accomplished.	1	2	3	4	5

Participation in this study is voluntary and responses to this questionnaire will not affect your job or your position at Children's.