The Effects of a Longitudinal Patient Experience on the Enhancement of Empathy in First and Second Year Medical Students

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THE EFFECTS OF A LONGITUDINAL PATIENT EXPERIENCE ON THE ENHANCEMENT OF EMPATHY IN FIRST AND SECOND YEAR MEDICAL STUDENTS

By

SUSAN E. KANE

A dissertation submitted to the Graduate Faculty in Educational Psychology in partial fulfillment of the requirements for the degree of Doctor of Philosophy, The City University of New York
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By

Susan Kane

This manuscript has been read and accepted for the Graduate Faculty in Educational Psychology in satisfaction of the dissertation requirement for the degree of Doctor of Philosophy.

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ABSTRACT

The Effects of a Longitudinal Patient Experience on the Enhancement of Empathy in First and Second Year Medical Students

By

Susan E. Kane

Advisor: Helen L. Johnson

This study examines the effects of a longitudinal patient experience on the enhancement of empathy in first and second year students attending Weill Cornell Medical College (WCMC). The Longitudinal Educational Experience Advancing Patient Partnerships (LEAP) is a new required program at WCMC. Entering Medical students are matched with chronically ill patients whom they will follow throughout medical school. One of the objectives of the LEAP program is to create an experience that will create more empathic medical students. Empathy is an attribute that is considered essential for a strong doctor-patient relationship. With the development of the Jefferson Scale of Empathy (JSE), the measurement of empathy has become increasingly accepted and used
in numerous studies. In recent years the ability to teach empathy to medical students has become a more important focus of medical education. The LEAP program is an example of this type of educational intervention. Providing an opportunity for longitudinal patient interactions in the pre-clinical experience may help to facilitate the enhancement of empathy. Using a quasi-experimental model, this study uses the JSE as a pre and post test to determine the effects of LEAP participation on empathy
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Introduction

As the medical profession changes, medical education must evolve to address the needs of medical students who are to become our future doctors. With the expansion of technology and science-based treatments, the focus is often on the disease at the expense of the patient. The major advances in technology that have occurred, as well as the growing interdependence of the many components of the health care system, have made it more essential that the physician understand the importance of the patient-centered approach to clinical care. Without this focus, medical treatment would become more and more impersonal. (Berwick & Finkelstein, 2010). This chapter focuses on the importance of empathy in the doctor-patient relationship, its definition, and how it is being addressed in the field of medical education.

One of the goals of medical education is to teach the professional skills that exemplify a “good doctor”. It is now widely acknowledged that empathy is one of the essential skills needed for effective patient care (Tavakol, Dennick, & Tavakol, 2012). In fact, 80% of patients would recommend an empathic physician to other individuals (Derksen, Bensing, & Lagro-Janssen, 2013). A physician who is able to convey empathy is more able to ease the stress and fear of patients in difficult situations. (Lelorain, Bredart, Dolbeault, & Sultan, 2012) found that cancer patients who viewed their physicians as being empathic had better satisfaction and less distress than those who did not see their physician as being empathic.
Empathy is not only an important component for patient satisfaction; studies have shown that it can actually improve clinical outcomes. Diabetic patients with empathic physicians were significantly more likely to have good control of their hemoglobin A1c than those who had non-empathic physicians. They were also significantly more likely to have good LDL-C control (Hojat et al., 2011). Moreover, patients who encountered empathic physicians had a reduction in the severity and duration of a common cold (Rakel et al., 2011). One explanation for these clinical outcomes is that patients who trust their physicians are more likely to disclose important information about their condition and their lifestyle. This additional information enables the physician to provide better medical care. There are several studies that show that patients are more likely to trust physicians who they feel are emotionally attuned to their situation. Empathic doctors are also better able to decrease anxiety and increase coping skills which also leads to better adherence and better outcomes (Halpern, 2014).

Empathy benefits not just the patient, but also the physician. Empathy in health care providers has been associated with decreased burn-out and depression, as well as increased life and work satisfaction (Decety & Jackson, 2006). There has even been evidence that empathic physicians have lower malpractice liability (Batt-Rawden, Chisolm, Anton, & Flickinger, 2013).

**Defining Empathy**

Although it is widely agreed that empathy is an important component of the doctor-patient relationship, there is less agreement about its definition. Empathy is often confused with sympathy. Often, sympathy is described as an emotional construct, while empathy is a cognitive understanding of the person’s situation. Physicians who are
empathic share their understanding, while sympathetic physicians share their emotions (Hemmerdinger, Stoddart, & Lilford, 2007). The desire to help a patient that is based in sympathy is more likely to be an “egotistic motivation to reduce personal distress” (Hojat & LaNoue, 2014). It has been observed that emotions that arise from feeling the pain of others may, in fact, inhibit efficient problem solving, including clinical reasoning (Haque & Waytz, 2012).

This difference in the definition of empathy and sympathy is one that is used frequently in medical education. It is simple and easily applied to the practice of medicine. There are, however, may other definitions that are more integrated with other psycho-social concepts and ideas.

Often, empathy is defined as comprising two dimensions, the first is affective and the second is cognitive. The affective dimension is based on emotions and is often difficult to differentiate from sympathy. The cognitive dimension refers to being able to intellectually take the perspective of the patient (Tavakol et al., 2012). Derksen et al., (2013) describe empathy as the competence of the physician to understand the patient’s perspective and feelings, to communicate that understanding and check its accuracy, and to act on that understanding in a helpful therapeutic way. This definition implies that there are three levels of empathy: attitude (affective), competency (cognitive), and action (behavioral). Hojat et al. (2002) describe the cognitive dimension of empathy as “the ability to understand another’s inner experiences and feelings and capability to view the outside world from the other person’s perspective”. Hojat and LaNoue (2014) stress the importance of distinguishing the affective and cognitive dimensions of empathy in medical education. Empathy that is based in cognition and understanding is more
amenable to change and can therefore be modified through education. In contrast, Shapiro (2008) notes the importance of focusing on the affective dimension of empathy. She encourages students to become comfortable with the emotions involved in patient care so that they don’t become distressed and, as a result, attempt to distance themselves. Shapiro states, “Being able to emotionally contain with compassion rather than fear the difficult realities of the human condition can form the core for formulating a deep and lasting empathy.” Students can use faculty mentors, reflective writing, and small group discussions to process the feelings that arise when confronted with uncomfortable and painful patient experiences.

Recently, there has been research based in neuroscience that demonstrates the importance of both components of empathy. Through functional neuroimaging, it has been determined that the cognitive, affective, and regulatory components of empathy involve interacting neural circuits (Halpern, 2014). Svenaeus (2014) stresses the importance of not separating the two components and instead labels the affective component as “professional concern”. While empathy can lead to the perception of uncomfortable emotions, it can also create “an imaginative or dialogic attempt” to determine the cause and, as a result, a motivation to help alleviate the pain.

**Enhancing Empathy**

Despite the discrepancies in the definition of empathy, the American Association of Medical Colleges (AAMC) has identified the enhancement of empathy as one of the major goals of instruction (Bayne, 2011). While there is no “standard practice” in curricular development to enhance empathy, much of the existing literature does focus on the cognitive and behavioral aspects of empathy because they are the easiest to teach and
measure (Bayne). These programs tend to use educational interventions such as training in communication skills, problem-based learning, and role-playing (Batt-Rawden et al., 2013). Instructional methods that attempt to focus on the moral and emotive include narrative and creative art interventions, writing, and experiential learning techniques that ask the students to simulate a patient experience (Batt-Rawden et al.). Small group work designed for empathy training also has been successful (Bayne), and exposure to positive role models has also had a significant effect on empathy in medical students (Tavakol et al., 2012). Students should be exposed to mentors who not only are able to display empathy to the patient, but who also are “transparent about their emotional reactions to patients and about working the edge between intimacy and detachment“ (Shapiro, 2008). While these instructional techniques all have had some positive effect on empathy, there has been very little research on how longitudinal relationships with patients affect the student’s empathy.

**Medical Education Reform**

Before 1910, doctors were trained through apprenticeships. They were expected to learn medicine by observing experienced practitioners working with patients. In 1910, Abraham Flexner proposed a new model of medical education that included a more rigorous instruction of science. His model was more structured and regulated across institutions (Berwick & Finkelstein, 2010). This model was used for decades in medical education. This four-year model consisted of two years of hard basic science followed by two years of clinical experiences. Medical students were required to spend the first two years of their education in lectures and classrooms learning science. In their third year
they were asked to quickly adapt to the chaotic world of patient care in the hospital. There was no real opportunity to develop long-term relationships with patients.

One hundred years after Flexner introduced his educational reform, the Carnegie Foundation issued a report entitled “Educating Physicians: A Call for Reform of Medical School and Residency.” In this report, there were several recommendations on how medical education could be improved to meet the needs of today’s society. One of the recommendations was to “engage learners at all levels with a more comprehensive perspective on patients’ experience of illness and care, including more longitudinal connections with patients” (Irby, 2011). Long-term contacts with patients dealing with chronic illness provide an opportunity for students to understand the experiences of the patient. In particular, students are able to see how the patient is affected by their illness not just physically but also mentally and emotionally.

Shapiro, 2008 stresses the importance of understanding the uncertainty of medicine; she calls it “the ethics of imperfection”. When students establish long-term relationships with patients, they are able to see the person and not just the disease. The ethics of imperfection asks the student to “recognize and explore, rather than reject and flee from, shared similarities with suffering others, while honoring the inexact and incomplete nature of apprehending their unique experiences”. Students interacting with patients in a longitudinal program are more likely to experience this. Their patients, who are in fact their teachers, provide lessons about the imperfection of medicine more effectively than through other methods of instructions.
Longitudinal Clinical Experience

The focus of the current study is the effects of a longitudinal patient care program on the enhancement of empathy in first and second year medical students. The program, which was previously piloted at the Weill Cornell Medical College, is called Longitudinal Educational Experience Advancing Patient Partnerships (LEAP). LEAP includes many of the instructional interventions that are currently being used to enhance empathy. The program pairs first and second year medical students with patients who are chronically ill. The students are expected to interact with the same patients throughout their four years of medical school. Through monthly encounters students will follow their patient to appointments, support groups, and medical tests. They may do home visits or simply connect through a phone call. The majority of their contact with LEAP “patient-teachers” will occur in the first and second years before the students begin their clinical years on the hospital floors.

LEAP also includes group work and exposure to positive role models. In the first two years, the students meet monthly in groups of 10-12 with faculty mentors. These groups provide an opportunity to discuss their experiences. Students are asked to present psychosocial and biomedical topics based on their patients’ diagnoses and experiences within the health care system. There is also an opportunity for students to use art and literature to explore their experiences through reflection. While the program provides numerous educational experiences to enhance empathy, it is the experiences of the patient and family that create the central basis of learning.

To ensure that the students are meeting with their assigned “patient-teachers”, students in the program are required to keep electronic logs of their patient encounters,
using an on-line program. This documents information about the frequency of the encounters as well as the type of encounter such as: office visit, home visit, procedure, or phone call.

To determine if the LEAP program has a positive effect on the empathy level of the students, students were asked to complete the Jefferson Scale of Empathy (JSE). The JSE is a measure that been widely used both in the United states and internationally (Hojat, Louis, Maxwell, Markham, Wender, Gonella, 2014).

In the fall 2015, an incoming class of first year students (Class of 2019) began the LEAP program. They were paired with the second year class (Class of 2018) who had already completed a year of the program. Both classes were tested on their level of empathy using the JSE. The first-year class (MS1) were the control group since they had not yet participated in the program. The scores of the two classes were compared. All of the students were tested again at the end of the academic year. This provided scores for students who had participated in LEAP in both their first and second year of medical school, and for students who had just completed only one year. Other variables that were examined were: gender, age, prior work experience, and the type of patient assigned. In addition, students were asked about personal experiences with illness, either in themselves or in their immediate family since this may also affect their baseline empathy.

In addition to the students, at the end of the year, the patients were asked to complete a survey to determine how they perceived the empathy of students. This is to verify that the students’ self-reported level of empathy is corroborated by the patients. The patients were asked to compete the Consultation and Relational Empathy (CARE) measure. This brief survey was constructed to measure patients’ perceptions of relational
empathy in health care providers. There is data that supports the validity and reliability of this measure (Mercer, Maxwell, Heaney, & Watt, 2004).

The LEAP program provides a unique opportunity for medical students to understand the experience of being a patient. As a student begins to understand medicine from the perspective of the patient, it is expected that she will become a more empathic health care provider. A first-year LEAP student who had participated in a Caesarian of her patient wrote a thank you note to the obstetrics team. She said “I'll be learning about the physician side of OB with your team in the future, but it was a really special experience to see everything from the patient's perspective.” It is hopeful that this experience will enhance the empathy of this student when begins her clinical experiences in medical school, residency and her medical career.

The purpose of this study was to determine if a longitudinal patient experience will enhance empathy in first and second year medical students. The continuity of the patient experience was expected to provide a patient perspective that was previously unavailable to medical students in their early foundational years.
Chapter 2

Literature Review

This chapter will provide a review of literature about empathy as a construct and its importance in medicine and medical education. It will review literature that describes current educational innovations being used to teach empathy and humanism, particularly longitudinal patient care programs. The chapter begins with a review of literature designed to define and analyze the construct of empathy. Because empathy is a fairly new term, dating back only 100 years (Cuff, Brown, Taylor, & Howat, 2014), there is a diversity of opinion about how it is defined and how it differs from similar constructs such as sympathy. After describing how empathy is defined and described in the literature, the review will explore the importance of empathy in the field of medicine. In particular, it will examine how empathy affects the doctor-patient relationship and healthcare outcomes. The next section will examine the apparent decline in empathy among medical students. The reasons for the decline will be addressed, as well as the differences between diverse groups of medical students.

A second focus for this literature review is to explore the field of medical education and how it has evolved since the 1910 report on medical education by Abraham Flexner. In particular it will look at how the curricular design of two years of basic science followed by two years of clinical experiences (2+2 curriculum) came into existence. The contribution of this curricular design to the decline in empathy in medical students will be addressed.
The review also will cover the new reform in medical education proposed by the Carnegie Foundation to address some of the deficits created by the 2+2 curriculum structure (2 years of basic science followed by 2 years of clinical experiences). Some of the recommendations proposed in this report were meant to address the teaching of empathy and humanism in medical school. These are discussed in relation to educational interventions that are currently being implemented in medical schools around the world.

A particular focus of this literature review will be on longitudinal clinical experiences that provide students with patient continuity. These experiences provide an opportunity for students to develop long-term relationships with patients, which are hypothesized to support empathy. The program evaluated in this study is a new longitudinal patient experience that begins in the first year of medical college. While most longitudinal experiences are designed for students in the clinical years, this program focuses mainly on providing these experiences for first and second year students.

**What is empathy and how does it affect the physician?**

Empathy can be a difficult and complicated construct to define. It is often defined as a concept that is cognitive, affective, or a combination of both. It is often problematic to distinguish from the similar construct of sympathy. Cuff et al. performed a literature review of 42 articles that defined and summarized empathy. The goal was to develop a more complete definition that included the themes encountered throughout the review. These themes included: “distinguishing empathy from other concepts”, “is it cognitive or affective?”, “is it congruent or incongruent?”, “is it subject to other stimuli?”, “is there a self/other distinction?”, “are there trait or state influences?”, “does it have a
behavioral outcome?”, and “is it automatic or controlled? Based on these themes they developed a very specific definition. Their definition states:

“Empathy is an emotional response (affective), dependent upon the interaction between trait capacities and state influence. Empathic processes are automatically elicited but are also shaped by top-down control processes. The resulting emotion is similar to one’s perception (directly experienced or imagined) and understanding (cognitive empathy) of the stimulus emotion, with recognition that the source of the emotion is not one’s own.”

The authors describe the difference between sympathy and empathy as the difference between feeling “as the other person and feeling “for” the other person. They feel that both of these constructs have some value in the clinical encounter. They describe a study in which it was determined that doctors who took a more sympathetic approach made greater use of hospital resources such as lab tests (Nightingale, Yarnold, & Greenberg, 1991). It could also be argued that doctors with a more empathic approach might not need the additional tests, as they are able to elicit the necessary information from the patient themselves.

It often stated in medical literature that while empathy is a cognitive concept, sympathy is emotional and possibly detrimental to the doctor-patient relationship (Hemmerdinger et al., 2007; Hojat & LaNoue, 2014). Hojat & LaNoue describe them both as eliciting “prosocial” behaviors. The difference is that the behavior that is a result of “empathic understanding” comes from a place of altruism, while the behavior that comes from “sympathetic feeling” is motivated by the need to reduce personal distress as
a result of the feelings. In the previous study by Nightingale et al., the fact that the sympathetic doctors order more tests and use more of the hospital resources could be a result of not being able to deal with one’s own discomfort. It is easier to deal with test results than the discomfort of dealing with the emotional pain of the patient. This is in contrast to the more empathic doctors, who were often able obtain the same information by talking to patient without having to use the resources. This view of empathy over sympathy became prevalent in medicine and lead to the concept of “detached concern”. This term refers to the idea that physicians need to suppress their emotions so that they can remain objective in their treatment of patients (Halpern, 2014). The value of detached concern has recently come into question; however, there may be some advantage in it. There has been research that shows medical students who become too emotionally attuned to the suffering of their patients may become distressed and, as a result, develop less cognitive empathy. Distress in medical students was identified as burnout, a low-sense of well-being, a reduced quality of life, and depression. Empathy becomes more difficult for students who must deal with their own distress (Neumann et al., 2011). It has also been suggested that physicians who can maintain a level of emotional empathy without becoming anxious appear to have the highest level of job satisfaction (Halpern, 2014). If there is no separation from the pain and suffering of the patient, the distress of coping with the suffering of patients can be detrimental to the doctor/patient relationship. Halpern suggests that a better model for the physician is “engaged curiosity” that includes both affective and cognitive brain pathways. Halpern describes the goal of “engaged curiosity” as “being able to utilize affective resonance or feelings of concern reflectively, in service of better understanding and communicating
with the patient”. Halpern, based on her own clinical experience, has written six essential points about “engaged curiosity”, these are:

1. One can still be a caring doctor even though it may difficult to empathize when in conflict with a patient about treatment.
2. To lessen feelings of discomfort and anxiety, we should not avoid our own feelings. Instead, if we pay attention to them they will not intensify.
3. People are more interested in our negative than our positive feelings.
4. The less a clinician tries to say something smart or knowledgeable about the patient’s psyche and the more she simply repeats the patient’s exact words, the more the patient will communicate.
5. Body language is as important as words.
6. Accepting blame is not a sign of weakness. Both the patient and the caregiver can find it empowering.

(Halpern, 2014)

These examples provide a practical guide for the physician dealing with both the cognitive and affective components of empathy. They provide explicit instruction on how to display empathy to the patient as well as how to deal with one’s own feelings of discomfort during a patient encounter.

Svenaeus (2014) argues that empathy and sympathy should not be separate concepts and that sympathy is what makes empathy possible. Doctors need to be able to understand and relate to the feelings of patients faced with health concerns and/or disease. Svenaeus calls this type of sympathy “professional concern”. He defines empathy as an emotion that will always include feelings about the suffering of the other
person, but that it should be used to explore the reasons behind the pain and, more important, possible ways to alleviate it. Svenaeus feels that empathy always begins with a “pre-conscious feeling with the other”. Once we perceive facial and bodily expressions we develop emotions about the other person’s feelings, and as an extension, the other person. This he describes as “sympathy”. Svenaeus argues that these emotions are what propel us to take actions to help the other person. It is “professional concern” that allows the physician to understand the feelings of the patient, but in the context of being someone with the training and ability to help. Professional concern does not protect the physician from becoming distressed or feeling helpless, but with proper training in empathy, the proper time to meet and talk with patients, and the ability to reflect with other professionals, doctors can overcome some of these negative emotions. Whether the affective state is empathy or sympathy, there is general agreement that it is important for the healthcare provider to learn to cope with these feeling to avoid stress and burnout. The desire to lessen the suffering of the patient should be altruistic and not stem from one’s own feelings of discomfort.

Shapiro (2008) agrees that the feelings that arise in clinical encounters can create distress in clinicians. She describes how modern medicine has created a culture where the scientific method has allowed the doctor to distance herself from the patient through technology. She describes modern medicine as promoting “scientific altruism” where the patient becomes an object of interest and not a person experiencing suffering and pain. Shapiro feels that doctors and medical students need to adhere to an “ethic of imperfection”, through which they can understand that we are all vulnerable and that often science does not have all the answers. While it is, of course, essential that medical
students learn the basic sciences before treating patients, it can give them a false sense of the certainty of medicine. Treatments and medications do not always work and often their effects can vary between patients. Physicians must understand that all patients are different and that treatments will not be as effective as were presented in the basic science courses. If doctors do not encompass the ethic of imperfection, it becomes easier to treat the patients as “others”. This separation provides protection from the feelings of vulnerability and despair when medical intervention is not successful. It is important for students to understand that suffering happens to everyone, including physicians, and that it is inevitable. According to Shapiro, this acceptance will also help to alleviate the feelings of discomfort that lead to distress in physicians and medical students.

Lamm, Batson, & Decety (2007) conducted a study to explore how observing others in distress affects individuals involved in patient care. They found that the person’s ability to differentiate her pain from the pain of the subject was an important component of empathy. The same study also examined the effects of cognitive appraisal on the perception of pain in another person. The participants in the study were asked to observe video clips of patients in distress and to imagine either how the patient feels or how it would feel to be in patient’s situation oneself. Using functional magnetic resonance imaging (fMRI), it was found that the neural mechanisms in both of these situations were similar but that additional neural mechanisms are needed to provide the ability to differentiate oneself from the other. Without these additional mechanisms empathy became about decreasing one’s own discomfort. In fact, it was found that without the lack of these neural mechanisms, there was a higher activity in the areas of the brain designed to respond to threat such as the amygdala and the insula. Lamm et al. manipulated
cognitive appraisal by telling participants that medical treatment had been administered. They were either told that the treatment was effective or that it had not worked. Both behavioral and fMRI data demonstrated that there was higher negative emotional response when the participant was told that the treatment was not effective. While it is important that doctors are able to understand the pain and suffering of their patients, if they over-identify with that pain it can cause distress and burnout (Halpern, 2014; Svenaeus, 2014). This reflects the idea of Shapiro (2008) that it is important for doctors to be able to understand and accept the uncertainty of medicine. The participants in the study displayed better empathy when treatment was successful, and were uncomfortable when they were told that it did not work. Based on their findings, Lamm et al. (2007) developed a definition of empathy that includes three components. First, there is an affective response to another person. Secondly, there is a cognitive capacity to take the perspective of the other person, and finally, there is some monitoring mechanism that keeps track of whether the feelings come from oneself or from the other person. If the feeling comes from oneself, the recommendation from Halpern (2014) to acknowledge those feelings to lessen the discomfort becomes an essential part of becoming an empathic doctor.

Based on the literature, it would appear that empathy does have cognitive and affective components, and that both have their place in the in doctor-patient relationship. In addition, physicians must be able to translate their feelings of empathy into effective patient care. If they distance themselves through “detached concern” because they are uncomfortable with their own emotions, they may not be able to communicate care to the patient. If the physician over-identifies with the pain of the patient, it may cause distress
or even burnout and inhibit the physician from providing proper care. The empathy provided by the physician should enable her to not only understand the perspective of the patient, but also be able to convey that understanding back to the patient. It is essential that the physician be able treat the patient to the best of her ability. If the physician is in distress due to over-identification with the patient’s situation, this becomes more difficult. A definition of empathy in the field of medicine needs to include all of these components.

One of the most widely used definitions of empathy in physicians was developed by Mercer & Reynolds (2002). They defined physician empathy as the ability to:

1. Understand the patient’s situation, perspective, and feelings (and their attached meanings)
2. To communicate that understanding and check its accuracy; and,
3. To act on that understanding with the patient in a helpful therapeutic way.

(Mercer & Reynolds, 2002)

The definition includes affective (1), cognitive (2), and behavioral (3) components of empathy and is widely used in medical literature because it takes a multidimensional approach and attempts to distance itself from the emotional and sympathetic aspects of empathy. The definition implies that empathy is something that can be learned as a professional skill (Neumann et al., 2012). If empathy is a teachable skill, it should be an essential component of physician training. An essential component of this training is learning how to deal with one’s own distress. The LEAP program attempts to provide experiences necessary to understand the patient and an opportunity to reflect on feelings related to those experiences.
With this definition as a guide, it is important to examine the effects of empathy on the doctor/patient relationship.

**Empathy and the Doctor/Patient Relationship**

It is assumed that if asked, most patients would say that they preferred a physician who was empathic and capable of understanding their pain and discomfort. The patient may not be able to articulate exactly why it is important, or how it would affect the outcomes of treatment, but they understand that it is an essential component of the doctor/patient relationship. In fact, this has been the topic of much research. To examine the effects of empathy on patient outcomes, Derksen et al., 2003 conducted a systematic literature review focused on the effectiveness of empathy in general practice. Derksen et al. reviewed studies that contained empirical data about patients’ experiences with their general practitioners’ ability to empathize. After using specific search criteria, they found 964 articles. Of these articles, only seven were included in the review due to quality assessment. The criteria for the review included articles published in English that detailed original and empirical studies. They did not include articles that were reviews, guidelines or theoretical pieces. Based on the paucity of articles that met the criteria, it appears empathy in medical practice is an area that has received scant attention in empirical medical research.

Derksen et al. found that empathy played an extremely important role in doctor-patient communication. The review reflected improvement of patient satisfaction and adherence, a decrease of anxiety and distress, better diagnostics and clinical outcomes, and better patient self-efficacy. These results are understandable when one considers that patients who trust their physicians are more likely to provide necessary information for
Hojat et al. (2011) conducted a correlational study that included 891 diabetic patients being treated by family physicians to determine the associations between empathy and clinical outcomes. The researchers used the patients’ hemoglobin A1c and LDL-C levels and rated them as “good control” and “poor control”. Their physicians were asked to take the Jefferson Scale of Empathy (JSE), a survey that has been found to have validity and reliability in the measurement of empathy in healthcare providers (Hojat et al., 2011). The scores of the doctors were rated as being high, moderate, or low. They found the number of patients with good control of Hemoglobin A1c levels and LDL-C levels was significantly higher among those who had doctors who scored high on the JSE. Conversely, patients who had poor control were significantly fewer among the doctors with high empathy scores.

Rakel et al. (2011) also conducted a study to observe how perceived empathy affected the clinical outcomes of patients who reported having a common cold. In this study, patients with symptoms of a common cold were divided into three groups. The first group did not see a physician at all. The patients were provided a nasal wash as a treatment. The second group saw a physician who took a history and did a physical exam. The doctor for this group was told to keep the visit short and have limited touch and eye contact. The third group was also given a physical exam and was asked to provide a medical history. This group, however, was provided an enhanced office visit that included a positive prognosis, empathy, empowerment, connection, and education. The patients were given statements such as “your cold will get better in the next few days”,

diagnosis. They also are less likely to feel alone in their illness and are more likely to take medical advice from a physician in whom they trust.
“yes, I know a cold can really zap your energy”, and “you can help by getting a good night’s sleep”. The patients were also given eye contact, a handshake, humor, and interactive discussion. Using surveys and biomedical markers (IL-8 and neutrophil counts), the researcher found a direct correlation between the enhanced visits and the lessening of the duration and severity of the common cold.

Decety & Fotopoulou (2014) describe many of the benefits of empathy in the doctor/patient relationship, including improved patient satisfaction, improved adherence to physician recommendations, and fewer malpractice complaints. Decety & Fotopoulou (2014) describe two theories that explain how physician empathy benefits the patient. The theories are non-mutually exclusive and attempt to explain how the patient benefits from the perception of empathy in a physician. Both theories describe neurobiological mechanisms through which interpersonal interactions can affect physical perception and outcomes (Decety & Fotopoulou). The first is the social baseline theory (SBT). The theory proposes that all organisms adapt to the presence of other organisms of the same species more than they do to physical ecology. In this way, social proximity to other individuals is a default assumption of the human brain. It creates interdependence, joint attention, and shared goals. The presence of social support reduces stress and increases health and wellbeing. Studies in neuroscience have shown that when social support is provided or anticipated, the neural pathways and hormonal stress responses that are activated when a person is in distress are not as dynamic. A person is better able to self-regulate emotion when support is available (Gunnar & Quevedo, 2007; Hostinar, Stellern, Schaefer, Carlson, & Gunnar, 2012).
The second theory is called the free energy principle (FEB). The theory is based on the idea that the brain is constantly dealing with the tension of a variable world by creating inferential hypotheses to attempt to predict the changing world without being caught off guard. As errors in predictions occur, the brain works to improve on its models. The perception of another’s empathy makes the patient feel safe, and have less of a need to process possible danger. Consequently the patient will experience less distress both physically and emotionally. When a healthcare provider makes a patient feel safe there is an increase in pain tolerance; however, when the danger and pain is reflected back to the patient, the pain tolerance decreases (Sambo, Howard, Kopelman, Williams, & Fotopoulou, 2010). Decety & Fotopoulou (2014) suggest that the combination of these two theories may be an important component of the placebo effect. The SBT demonstrates the people are better able to self-regulate their emotions when they have social support from their healthcare providers, while the FEB demonstrates that by adapting to a positive environment created by the physician, pain tolerance can increase. Together, these theories may help to explain how physician empathy can alleviate both physical and emotional distress in a patient.

In this study, students were given an opportunity to develop relationships with their patients. While this was expected to increase empathy in the students, it was also expected that by learning how to communicate their empathy to the patient, they would become more effective doctors with better patient outcomes. In spite of the documentation of the importance of empathy in the doctor/patient relationship, medical education has not been successful in teaching this concept to medical students in the past. Increasingly, the need to include empathy in the medical school curriculum is being
recognized. However, there is evidence that empathy actually decreases in students during medical school. Empathy decline in medical students has been well documented and needs to be addressed to ensure that future physicians are empathic and, therefore, more effective.

**Empathy and Medical Students**

Empathy does not just benefit physicians involved in patient care; it can also be beneficial to medical students who are just beginning their experience in patient care. Medical students who have higher scores on the Jefferson Scale of Empathy display higher outcomes in their clinical abilities and their professionalism. In addition, they have better interpersonal skills and are perceived by their classmates as being a positive influence (Hojat, Vergare, Isenberg, Cohen, & Spandorfer, 2015). The authors also found that empathy, optimism and personal accomplishment were all interrelated and that enhancement of any one would have a positive effect on the others. They suggest that these are all areas that should be addressed in any medical school curriculum.

Newton, Barber, Clardy, Cleveland, & O'Sullivan (2008) conducted a longitudinal study of medical students specifically looking at visceral or affective empathy. They found the largest decreases in empathy were after the first and third years of medical school. The decline in empathy in first year students was attributed to the stress of an overly competitive environment as they strove to achieve the best grades while studying the basic sciences. It was also observed that students might have a skewed positive image of physicians when entering medical school and that it is not always supported by their experience. Women had higher empathy scores than men in the study. Additionally, students who chose core specialties, such as internal or family medicine,
scored higher than those who selected more specialized careers. The second drop in empathy that was identified in this study occurred in the third year, when students are doing their clinical rotations. Newton et al. (2008) suggest several reasons for this, including an emphasis on treatment and technology and not on patient care. Also suggested are a lack of positive role models, a perception of abuse by their superiors, fatigue, and a lack of patient continuity.

Hojat et al. (2009) conducted a longitudinal study on medical students with similar results. Although the drop in empathy was not as significant in first year students, there was a significant decline for third year students. The decline in empathy was smaller in women and in students who chose “people-oriented” specialties over those that are more technologically focused. Hojat attributes the decline in empathy to “lack of role models, a high volume of materials to learn, time pressure, and patient and environmental factors” and a “focus on the science of medicine and a benign neglect of the art of patient care”.

Chen, Kirshenbaum, Yan, Kirshenbaum, & Aseltine (2012) examined empathy levels of medical students in all four years of medical school. Using a longitudinal cohort study, student empathy was measured using the Jefferson Scale of Physician Empathy-Student version. The data from this study also reflected a decline in empathy, particularly during the clinical years. More specifically, they found that the students entering medical school with higher empathy scores had a slower decline. As reflected in other studies, women and students interested in people-oriented specialties had higher empathy scores.

In a cross-sectional study of medical students, Hegazi & Wilson, (2013) did not observe a difference in the empathy scores of students in relation to their year of training.
They did, however, find higher empathy scores in female students. The authors also found that scores were highest in students who had completed personal and professional development courses. The additional training and focus on professionalism seemed to help to attenuate the decline in empathy.

Neumann et al. (2011) performed a systematic review of literature related to empathy decline in medical students. They included eighteen studies in their review and found that there was a significant decline in self-perceived empathy in medical student and in residents. The increase in patient contact during the third year of medical school appears to be one of the major causes of this decline. The authors suggest several reasons for this decline, including heightened sense of vulnerability as a result of encountering morbidity and mortality. Students may find it easier to cope with these new experiences by dehumanizing patients so that they can’t identify with the pain and suffering. Another reason for a decline in empathy may be related to students feeling that there should always be a “cure,” causing them to focus their attention on biomedical issues rather than on the patient himself.

Haque & Waytz (2012) describe the dehumanization of patients by physicians and their ability to distance themselves from their patient emotionally. The authors believe this is related to medical training which “encourages the regulations of negative emotions for the purposes of efficient problem solving”. The field of medical education has only recently begun to emphasize the development of medical school curricula designed to create a stronger focus on the humanity of patients. One of the more recent methods of encouraging students to become more involved with the patient as a person is the longitudinal clerkship. Longitudinal clerkships provide an opportunity for students to
participate in comprehensive and integrative care of patients over time. Rather than moving from block to block to learn each specialty, students remain at one location following a group of patients for an extended period of time. The University of California-San Francisco School of medicine compared perceptions of the clerkship experience among third year students enrolled in longitudinal clerkship or in hybrid or traditional block clerkships. Students in the longitudinal clerkships reported having more positive role models as well as a greater number of patient-centered experiences (Teherani, Irby, & Loeser, 2013). A longitudinal clerkship at Robert Wood Johnson Medical School was incorporated into the third-year curriculum in 2009. The “Humanism and Professionalism Clerkship” included blogging, journaling, and debriefing after significant patient events. Using the Jefferson Scale of Empathy to measure the student’s empathy, the researchers found that students did not show a decline in empathy after their third year as reflected in previous studies (Rosenthal et al., 2011). These programs are a result of the reform in medical education that has been occurring over the past decade. By creating a positive experience in which students learn from the perspective of the patient, it may become easier to view the patient as a person rather than as a set of symptoms.

The history of medical education is reflective of changes in the delivery of medicine. As doctors become able to distance themselves from patients through technology, empathy and humanism can be lost. It is for this reason that a call for curriculum reform in medical education was published in 2010. A brief overview of the recent history of medical education will be presented in the next section. There will be a particular emphasis on the reform that is currently occurring in medical education.
Medical Education Reform

In 1910 Abraham Flexner presented his report on the state of medical education and created a model based on the needs of that time. This model was developed in the context of “the age of modern science”. Before the Flexner report was introduced, the training of physicians was highly unregulated and relied on more traditional methods of apprenticeships. To promote standardization, professionalism, and a more scientific approach, Flexner focused on four areas that needed to be addressed in medical education. The themes were 1) lack of standardization, 2) lack of integration, 3) lack of inquiry, and 4) failure to focus on professional identity formation. Flexner’s report recommended a model that was university-based with a strong science-based curriculum (Irby, Cooke, & O'Brien, 2010). Included in these recommendations were the 2+2 curriculum design that has created a schism between the basic science and clinical years of medical school. Other recommendations that are still being implemented today include: the incorporation of laboratory learning into the curriculum with a connection to clinical practice, and the expansion of two years of clinical training in university teaching hospitals. Flexner also advocated for scientifically trained faculty to teach and serve as role models creating a focus on training physicians to “think like scientists (Irby et al.). Since that time the structure of the medical school undergraduate curriculum has remained largely unchanged.

Initially the model proposed by Flexner was effective because of the simplicity of medicine at that time. Doctors had a limited number of treatments and diagnostic tests available to them. Almost all physicians practiced primary care and there were very few specialists. The cure depended more on the condition and on the patient himself than on
available treatments (Berwick & Finkelstein). It was easier to explore the science without losing focus on the patient because there was less available. As the quantity and efficiency of science and technology-based treatments expanded over the years, it became easier for physicians to focus more on the disease and less on the patient. The 2+2 curriculum only reinforced this dichotomy between science and clinical care.

It soon became clear that as medicine changed, the methods of educating physicians also needed to be revisited. In 2010, the Carnegie Foundation published a report entitled *Educating Physicians: A Call for Reform of Medical School and Residency*. Using themes similar to those addressed in the original Flexner report, the report calls for: 1) standardizing learning outcomes and individualizing the learning process, 2) integration of formal knowledge and clinical experience, 3) development of habits of inquiry and improvement, and 4) formation of professional identity (Irby et al., 2010). The authors suggest early clinical immersion; integration of the basic, clinical, and social sciences; engaging learners at all levels with a more comprehensive perspective on patients’ experience of illness and care; including more longitudinal connections with patients; providing opportunities for learners to experience the broader professional roles of physicians; and incorporating inter-professional education and teamwork in the curriculum (Irby et al., 2010).

The integration of science and clinical experience is an essential component of this curricular change. Berwick & Finkelstein (2010) equate the traditional medical school curriculum, with its 2+2 structure, to workers on an assembly line (only) focusing on only one particular area of production without ever being able to see the bigger picture. They stress that longitudinal, multidisciplinary, and team-based training are
important for curriculum integration because it allows the students to see interdependent relationships within medicine.

Kulasegaram, Martimianakis, Mylopoulos, Whitehead, & Woods (2013) describe the integration of basic and clinical science as a cognitive activity for medical students. The integration allows the student to link knowledge of basic science with clinical care. This can only occur if the knowledge comes from different sources. Kulasegaram et al. (2013) stress the idea that students should be able to take the knowledge gained in the classroom and the labs and connect it to experience with a patient. This is how medical students begin to understand the practice of medicine.

Bleakley (2012) describes a curricular reform based on recommendations of the Carnegie Report that focuses on patient-centeredness. Bleakley recommends a longitudinal integrated clerkship, beginning in the first two years of medical school, as the optimal way of addressing all these principles and stresses the importance of authenticity. Authenticity does not come out of the quantity of the patients seen but rather in the quality of the relationship with the patient. These relationships allow the student to “learn to think or reason with patients in mind.” The author also describes how this early longitudinal patient experience can influence and enhance a student’s clinical reasoning skills by providing an opportunity for students to learn to reason “with, from, and about patients with “science narratives informing patient stories”. Students can learn to rephrase their basic science concepts (disease) into clinical concepts (illness) and to then view those in terms of a patient’s “life”(Bleakley, 2012). The proposed study explores this recommendation through the evaluation of the LEAP program in the first two years of medical school when the students are focused on a basic science curriculum that includes
anatomy, histology, physiology, and the study of disease. LEAP was designed as a response to the Carnegie report and was designed to integrate the basic science and clinical curriculum by exposing first and second year students to patients at the same time as they are learning the science behind disease. As an example, students have an endocrine module in their first year. As they learn about the endocrine system, issues related to a LEAP patient with diabetes takes on more meaning than just the psychosocial experiences of the patient. The student begins to understand not only how the patients feel but also why they are experiencing their particular symptoms. The patients also help the student better understand the scientific concepts by providing a real-life example. The patient experience becomes more integrated for the medical student and the student learns about both the patient and the disease and how they interact.

An integrated longitudinal curriculum as recommended in the 2010 Carnegie report creates a more patient-centered approach which may enhance, or at least sustain, empathy in medical students. The following section will explore some educational methods of teaching empathy and humanism.

**Teaching Empathy and Humanism**

With a focus on curriculum integration and on the need to enhance empathy in medical students, there have been several educational innovations developed to enhance empathy and humanism. Batt-Rawden et al. (2013) performed a systematic review of literature on interventions that were developed to enhance empathy and found that many effective interventions exist in medical education. Successful interventions included: patient narrative and creative arts, writing, drama, communication skills training, patient
interviews, experiential learning, and empathy-focused training. They also stress the importance of positive role models in their faculty.

Hojat, Axelrod, Spandorfer, & Mangione (2013) performed a two-phase randomized control study using the Jefferson Scale of Empathy as a pre and post-test. In the first phase of the study, 113 second-year students were asked to watch video clips of patient encounters from movies such as *Wit, The Doctor, and First Do No Harm*. The control group consisted of 119 second-year students who watched a documentary about Walter Reed. Post-test results demonstrated a significant improvement in the empathy scores of the experimental group while the mean score of the control group remained the same. The second part of the study was conducted 10 weeks later. It was designed to look at the long-term effects of these gains in empathy scores. The experimental group was divided into two groups. The first group of 55 students participated in a lecture and discussion about the importance of empathy. The 38 students in the second group watched and discussed a movie about racism in medicine in the 1940’s called *Something the Lord Made*. Sixty-nine of the students from the original control group were also retested. The students in the group that participated in the empathy lecture maintained the enhanced empathy scores reflected after the first intervention. The gain in empathy scores for the group who watched the movie on racism was lost without the reinforcement of the lecture. The control group remained the same. The results reinforced the hypothesis of the authors that empathy gained through educational interventions must be reinforced if it is to be sustained. Based on the results of this study, it is expected that longitudinal programs may both increase and sustain empathy through consistent reinforcement though patient interactions.
Afghani, Besimanto, Amin, & Shapiro (2011) describe the attitudes of third and fourth year students toward a curriculum that emphasized humanism and empathy in the doctor-patient relationship. These students had already completed their first two years and were involved in their clinical years. Positive evaluations of more experienced medical students are beneficial when developing programs for students in the pre-clinical years. In this case, the four-year curriculum included lectures and workshops that included reflection, writing and exercises in creative perspective taking. Students were encouraged to take what they learned in the classroom and apply it to their clinical setting in the third and fourth years. The students in their study were very satisfied with their training in empathic skills, but felt that the curriculum could be improved with better attending and resident role-models. Positive faculty mentors increase student satisfaction in learning to be empathic physicians. The program being examined in this study includes faculty mentors with whom the students also develop longitudinal relationships. They serve as role models, mentors and counselors as students navigate their early clinical interactions.

Rosenthal et al. (2011) found that there was no erosion of empathy in the third and fourth-year students who participated in a longitudinal clerkship component that required students to blog about their experiences and participate in several group discussions with students and faculty. This component was a requirement throughout all of their required rotations including, medicine, surgery, obstetrics and gynecology, family medicine and psychiatry. The authors conclude that providing a safe environment for student reflection may attenuate the erosion of empathy in medical students. Reflection
allows students to acknowledge their discomfort and to learn that they are not alone in their distress.

The success of the longitudinal clinical experience can be explained through the lens of the learning theories that are most prevalent in medical education. These are socio-cultural learning theories that are based on situated and/or experiential learning. While all clinical experiences can be viewed through the lens of these learning theories, the longitudinal experience provides the opportunity to become immersed in the experience of the patient as well as the healthcare provider. The longitudinal experience provides an opportunity for the students to develop relationships with patients over an extended period of time. During this time, the student interacts not only with the patient but also with their healthcare providers. It provides an opportunity for the student to develop clinical awareness and empathy through exposure to the entire patient experience.

**Learning Theories Supporting Longitudinal Clinical Experiences**

Two major learning theories have been used to describe how learning occurs in clinical education. The first is Kolb’s “experiential learning” which includes four modes. These are: 1) concrete experience, 2) reflective observation, 3) abstract conceptualization and 4) active experimentation (Kolb, 1984; Yardley, Brosnan, & Richardson, 2013; Yardley, Teunissen, & Dornan, 2012). In this theory, the reflection after the experiences provides meaning to the experience. The insights that develop through reflection can be applied to future clinical experiences.

The second important learning theory is Lave and Wengers’s theory of “situated learning” and “communities of practice”. This theory focuses on learning through
“participation in the activities of a community”. Through the lens of this theory of learning, the field of medicine can be seen as a “community of practice” (COP). Doctors have their own ways of thinking, speaking, acting, and even dressing. The role of the medical student is to participate in the activities of medicine based on their abilities. This includes working with patients and more experienced faculty mentors. Until they gain the skills and knowledge to participate more fully, participating in clinical activities provides an opportunity to participate at the appropriate level under the supervision of more experienced members of the COP (Wenger, 1999). Lave and Wenger call this “legitimate peripheral participation” (Mann, 2011). Medical students are expected to learn from participation within the community but can only do so only to the extent that their previous experience and knowledge will allow. As they continue in their medical education, their participation will become more extensive and they will continue to learn how to become a member of the community of practice. One criticism of the use of medicine as a COP for students is that it may reinforce some of the negative aspects of social behavior often found in the medical community including hierarchies and power structures based on race and gender as well as the teaching of the hidden curriculum. If these shortcomings are not addressed they could have a negative effect on the empathy of the student (Cruess, Cruess, & Steinert, 2017).

Kelly, Walters, & Rosenthal (2014) propose the development of a new learning theory very similar to situated learning theory, but with less focus on the student as member of the medical community and more focus on the actual act of “doing medicine”. In their Community Based Medical Education (CMBE) Learning Theory, the focus is on relationships, meaningfulness and learning. The theory emphasizes longitudinal clinical
relationships with patients and preceptors. In this model, through working with patients over an extended period of time, medical students gain a better understanding of disease and its effects on patients. The longitudinal nature of the relationships with preceptors and patients makes learning more meaningful. While the focus of the Lave and Wengers Situated Learning Theory is to teach the student how to “be” a doctor by becoming part of the CoP, CBME focuses more on the practice of medicine through these meaningful relationships with the community, the patient and the preceptor (Kelly et al.)

Yardley et al. (2013) describe a concept that is based on these socio-cultural learning theories called metis. It describes the experience needed for students who are involved in “authentic early experience” in medical school. It is defined as “the kind of knowledge that can be acquired only by long practice at similar but rarely identical tasks, which requires constant adaptation to changing circumstances” (Yardley et al.). Metis refers to the individualized learning of a student based on his or her experiences. This is how students involved in longitudinal clinical experiences learn about medicine in a way that offers them coping mechanisms for when they are involved in more difficult medical situations in the future.

Mann, (2011) describes the difference between a “teaching” curriculum and a “learning” curriculum. In a learning curriculum the community itself becomes a resource. Students are provided an opportunity to interact within the community of medicine and can become skilled in its language, culture, and values. Learning occurs though participation in the culture and students are transformed by the participation. Mann describes longitudinal clinical experiences as a good example of this type of approach because it allows the student to become “meaningfully involved in the work of
the community.” A longitudinal patient experience such as the one in the proposed study is an excellent example of a learning curriculum. Students are not “taught” by their patients. Instead, they learn through shared experiences and interactions with the patients and their experiences within the healthcare system. The perspective of the patient cannot be taught effectively in the lecture hall or in short interactions with a series of patients.

The program also includes opportunities for reflection, faculty mentors, and small group interactions. The learning theories described all provide support for the effectiveness of these interventions in the process of learning in the clinical environment.

**Longitudinal Clinical Experiences/Patients as Teachers**

Longitudinal clinical experiences were rarely implemented in the traditional curriculum, in which students were only able to work with patients for a short period of time, with the probability of never seeing that particular patient again. The student was provided a clinical snapshot rather than the opportunity to view the patient experience over a long period of time. Although some schools have attempted to include longitudinal programs in the past, they are becoming more prevalent, especially as a method of teaching students to understand the patient experience.

Thistlethwaite et al. (2013) did a systematic review of longitudinal programs in both community and hospital placements and found they were successful because of the continuity of both patients and faculty mentors. The longitudinal experience provided a better opportunity for students to understand the importance of “the life-perspective, family dynamics, and social contexts of patients’ presentations”. Thistlethwaite et al., (2013) also stress that these experiences help students learn by participation in the community of practice of medicine. While longitudinal clinical experiences do provide
an opportunity to participate in the community of practice by learning the language and culture of medicine, they also provide an opportunity to participate in the culture of the patients. As this perspective changes so does the focus of the student. In the hospital, the focus tends to be on treatment, medicine, and technology while the longitudinal relationship changes the focus to the patient as a person.

Puvanendran, Vasanwala, Kamei, Hock, & Lie (2012) describe a longitudinal clinical experience that allowed third year medical students to follow clinically ill patients after they were released from the hospital following an acute encounter. The students identified two patients whom they followed for a ten-month period. The students were asked to reflect on their experiences though written narratives. The authors reviewed the narratives and coded their content. They found the most common themes immediately following the hospitalization were “biomedical care” and “health-care systems”. The themes changed after the 10-month longitudinal experience when “Chronic disease management” and “Patient-centeredness” became the primary themes observed in the narratives. It seems that as students became distanced from the science and technology available in the hospital they were better able to focus on the patient rather than the disease. As previously noted, the science and technology of the hospital environment can distract the student from the actual care of the patient as a person (Hojat et al., 2009; Newton et al., 2008).

Walters et al. (2012) performed a literature review that focused on longitudinal integrated clerkships (LIC). The study examined the evidence reflected in the outcomes of students who participated in these experiences compared to those who were enrolled in traditional block-rotation clerkships. The academic achievement between the two groups
was similar although there were some cases where the LIC students did perform better academically. It was found the advantage of these longitudinal experiences should not be evaluated in purely academic measures. The literature reflected other advantages among the students who participated in the LIC including: a more patient-centered approach, better ability to work inter-professionally, and higher-order clinical thinking skills. Students in these clerkships were better able to balance the scientific and technical skills with the more patient-centered stance of an empathic physician.

Using a case-control posttest evaluation study, Teherani et al. (2013) had similar results studying the learning outcomes and student perceptions of three different clerkships models. In addition to the LIC and traditional block model, they also included a hybrid model. One consistent finding was that all students preferred the continuity of working with patients and faculty across an extended time period. The academic gains were fairly equivalent for students enrolled in all of the clerkships, with very little difference between students in the traditional model and those with more continuity. As the continuity of experience increased, so did the quality of the students’ clinical performance. Continuity was also positively linked to student satisfaction, with LIC students having the most positive perceptions of the experience. If students are not provided a continuity of experience, they are merely exposed to “snapshots”, which provide little information about the experience of the patients. There are some situations in which it might be more difficult to empathize with patients because it seems their suffering could have been avoided with better lifestyle choices, however this can also change with more longitudinal relationships with the patient.
Through longitudinal clinical experiences students may learn to develop empathy for those with whom it may be more difficult to empathize. Roberts et al. (2011) provided an opportunity for students to have longitudinal relationships with bariatric surgery patients. Because physicians often have negative attitudes towards obese patients, the program was designed to help attenuate these attitudes in future physicians. The students followed the patients throughout the process and were asked to keep journals of their experiences. The journals reflected that students had previously held negative stereotypes about obese patients and that these were reduced as a result of the longitudinal experience.

The model of a longitudinal clinical program provides the experience of learning from patients themselves. The dynamic between a patient and a student is very different than that of a patient and a faculty member. There is less of a power dynamic and students may be more willing to ask questions. The most powerful component of learning from a patient is the realism and the authenticity of the patient experience. Learning about the management of a chronic illness is far more memorable when it comes from a patient who is experiencing the process. Learning from a patient fosters both professionalism and patient-centeredness, both of which are necessary for the promotion of empathy (Henriksen & Ringsted, 2011).

Many of these clinical experiences described in the literature were clerkships that traditionally occur in the third year of medical school. Only a few medical schools have decided to include longitudinal experiences in the “pre-clinical” years. In the US, only 26% of longitudinal programs are pre-clinical. “Patient attachment” programs focus on patient experience where “clinic attachment programs address clinical and diagnostic
issues”. Only 20% of LICs in the US are patient attached (Gheihman, 2017). LEAP is both pre-clinical and patient-attached. There are advantages to including this type of experience in the first and second year curriculum. Dornan et al. (2006) did a systematic review of literature on the effects of early exposure to clinical and community settings in medical education. The authors reviewed 73 studies that described outcomes related to clinical and community exposure in the preclinical years. The authors found that early experience enhances empathy toward patients. It makes students more confident about patient interactions and gives them “insight into social and psychological aspects of disease in real people”. In addition, the early clinical experience helps to provide context to what is being taught in other parts of the curriculum. As the students study the basic science of medicine they can see how it is manifested in the experience of the patients. The students in this study took classes focused on the basic sciences. The patient experiences provided an opportunity for them to apply this knowledge in a clinical context.

Branch (2015) describes a model for teaching professionalism and humanism that has had positive results in two multi-institutional studies. Branch developed this model over thirty years while working with medical educators from a variety of backgrounds. The model consists of four teaching methods. All of these methods must be included for the model to be successful. The teaching methods are 1) experiential learning, 2) critical reflection, 3) the opportunity for group support, and finally 4) a longitudinal curriculum. The review of the model was extremely positive. While each of these components has been successful individually, the results of the combined model seemed to indicate that each of the components enhanced the others. A review of the students’ reflections
provided evidence that the model is also successful in enhancing empathy. The reflection and group support are beneficial for medical students who are new to the clinical experience. As described in the description of experiential learning theory they provide an opportunity for students to process their experiences with patients and use the insight to enhance their future encounters (Kolb, 1984). The program in this study provided these experiences to help students understand their feelings as well as the feelings of their patients.

The focus of this study is a longitudinal patient program that includes all of the elements cited by Branch as being successful. It is a longitudinal patient program that includes patient continuity, faculty mentors, and reflective group work. While there are several longitudinal patient programs being implemented in medical schools in the U.S and internationally, most of these are clerkships and do not include first and second year students (Walters et al., 2012). This study focused specifically on the effects of this program on medical students who are beginning their medical education experience. In addition, the incorporation of the components of mentorship and reflection into the longitudinal experiences provided new information about teaching empathy to first and second-year students.

Based on the literature reviewed it was predicted that through establishing a relationship with a chronically ill patient, the students would begin to have a better understanding of the pain and discomfort of being a patient. They would experience the uncertainty of medicine and learn that treatments are not always effective. They would also learn that despite the vast medical knowledge that is now available, the solution to alleviating a patient’s distress may not always be easily found. An important lesson in
medicine is that that no matter what specialty one chooses, at some point have she will to give bad news to a patient. Some LEAP students have even experienced the loss of a patient with whom they have developed a relationship. These are profound experiences that can distress a student. It was expected that with the support of faculty mentors, small group interactions, and the opportunity to reflect, the students can learn to accept these experiences as part of being a physician. As students become more accepting of these situations they would able to focus more on the distress of the patient and less on their own discomfort. Larson & Yao (2005) state “to cultivate an acute ability to empathize with others, one needs patience, curiosity, and willingness to subject one’s mind into the patient’s world.” A longitudinal patient program truly enables the student to enter into the world of the patient. By exposing first and second year students to this experience, it is expected that they will be able to enter the stressful clinical years with a better understanding of themselves and their patients. To determine if a longitudinal experience does support the enhancement of empathy in the first and second years of medical college, the proposed study attempts to answer the following research questions:

1) Does participation in the LEAP program enhance empathy in first and second year medical students?

2) To what extent does empathy change after participation in the LEAP program?

3) Does gender affect empathy scores? Does it affect change in empathy after participation in the LEAP program?

4) Does age affect empathy scores? Does it affect change in empathy after participation in the LEAP program?
5) Does the quantity of patient encounters correlate with gains in empathy?

6) Is the student’s ability to empathize reflected back to the LEAP patient?

The methodology that will be used to explore these questions will be described in the subsequent chapter.

**Negative Inputs**

At the beginning of their education, medical students have a unique lack of experience. It is important to determine how empathy can be affected at this early stage of their educational development.

Lacking the professional training of a physician, beginning medical students may find it difficult and painful to experience the suffering of patients for the first time. The experience may be devastating causing the student to detach from the patient, in the hopes of appearing more professional and objective. This “detached concern” will decrease empathy and the humanization of the patients. This has been identified as part of the “hidden curriculum” of medical school (Neumann et al., 2011).

Students who are more focused on the basic science of the illness may find it easier deal with the patient because their interest is more focused on the biomedical aspect of medicine. By focusing on the disease rather than the patient, they also can detach from their feelings. This often contributes to the dehumanization of the patient.

Medical students have a great deal of stress not only from the increased workload of medical school but also from a new life away from family and friends. Studies have shown that stress does have as in inverse relationship to empathy. The first year, in particular, brings a unique set of stressful situations since everything is a new experience (Chen, Kumar, & Haramati, 2016).
Stress creates anxiety and depression that makes it more difficult to relate to the pain and problems of another. At the same time, the stress of having to deal with the chronic illness of patient may only increase the existing problem causing more patient detachment (Saravanan & Wilks, 2014).

The negative inputs and their effects on both students and patients are presented below in Table 1

**Table 1**  
*Negative Inputs for Empathy in Medical Students*

<table>
<thead>
<tr>
<th>Negative Outcomes/Inputs</th>
<th>Effect on Student</th>
<th>Effect on Patient</th>
</tr>
</thead>
<tbody>
<tr>
<td>Patient Dehumanization</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Focus on Disease</td>
<td>Focus on Disease</td>
<td>The patient is seen as a set of symptoms and not a suffering person. The patient feels misunderstood, and dehumanized.</td>
</tr>
<tr>
<td>learned in Basic</td>
<td>taught in Basic</td>
<td></td>
</tr>
<tr>
<td>Science</td>
<td>Science rather than on the patient herself. Student does not learn how to deal with the patient and loses empathy.</td>
<td></td>
</tr>
<tr>
<td>• Stress</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Haque &amp; Waytz, 2012)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Detached Concern</td>
<td>Student overwhelmed by observing the pain of chronic illness. Student tries to suppress emotions to seem objective and professional. This is often part of the “hidden curriculum” in medical school. If students and doctors) become overwhelmed with the care of suffering patients, they may resort to the “dehumanization” of the patients to distance themselves from the pain and suffering.</td>
<td>Patient finds it hard to connect. This makes the physician seems impersonal and distant.</td>
</tr>
<tr>
<td>• Overwhelmed by</td>
<td></td>
<td></td>
</tr>
<tr>
<td>emotions want to</td>
<td></td>
<td></td>
</tr>
<tr>
<td>appear professional</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Stress-overworked,</td>
<td></td>
<td></td>
</tr>
<tr>
<td>new life away from</td>
<td></td>
<td></td>
</tr>
<tr>
<td>family and friends</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Halpern, 2014)</td>
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</tbody>
</table>
Positive Inputs

There are many aspects of the new models of medical school curricula that have positive outcomes for the empathy of medical students. Most importantly, the new curriculum reform, based on the Carnegie Report, includes patient-centeredness as an important focus in the first and second years. Previously, in traditional medical school curricula, this was not introduced until students began their third year clerkships (Bleakley, 2013). In the past, before curricular reform, students’ only focus was on biomedical sciences. Now, with earlier clinical immersion, the student is able to learn about more than just disease, she is also able to see the effects on patients, their families, and their lives. (Irby et al., 2010). The student is less likely to dehumanize patients when they can see and understand more than the biomedical facts of the disease. It may make learning about the disease more relatable, but more importantly the student will have a better understanding of the patient. Because the student is also learning about the disease from the biomedical perspective, she will also begin to understand that medicine cannot solve all the problems a patient may be experiencing. As a result, she can learn to focus on the patient without trying to solve every problem. She will develop the “Ethics of Imperfection” (Shapiro, 2008) and learn to accept and understand the pain without feeling the need to solve the problem.

The new curricular model also includes a focus on professionalism. While there is no consensus on how to define professionalism in medical education, almost all definitions include patient-centered behaviors including humanism and empathy (Birden et al., 2014). Christianson, McBride, Vari, Olson, & Wilson (2007) describe a patient centered learning curriculum that focuses on professionals and has 10 learning domains,
half which are focused on patient care (i.e. eliciting and addressing the patient’s concerns and fears about his/her illness). The teaching of professionalism does help to attenuate the decline of empathy, particularly the cognitive and behavioral components of empathy, which is easier to teach (Mercer & Reynolds, 2002).

In the LEAP program, the students are assigned to groups with faculty mentors. The mentors are all clinicians and are available to assist students with patient issues. When students are having difficulties with patients, they can discuss them with the more experienced practitioners. Faculty mentors increase student satisfaction, which helps to decrease stress, particularly related to the patient interactions. The positive inputs and their effects on both students and patients are presented below in Table 2.
<table>
<thead>
<tr>
<th>Positive Outcomes/Inputs</th>
<th>Effect on Students</th>
<th>Effect on Patients</th>
</tr>
</thead>
<tbody>
<tr>
<td>Humanism/Patient Centeredness</td>
<td>Students learn about the cognitive, behavioral and affective aspects of empathy. They become more focused on the patient as a human rather than as a disease.</td>
<td>Provides a better feeling of safety for the patient, Patient feels heard and understood.</td>
</tr>
<tr>
<td>• Patient-centered curriculum</td>
<td></td>
<td></td>
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<tr>
<td>• Professionalism curriculum</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Irby et al., 2010)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Birden et al., 2014)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Engaged Curiosity. Using affective and cognitive components of empathy. Student can display empathy and learn to deal with their own feelings.</td>
<td>This may not occur immediately with the student but will hopefully happen over time. The student stops trying so hard to say the perfect thing and becomes more comfortable with verbal and non-verbal communication. Student will admit to weaknesses. As the student gets more comfortable with patients this will become easier to achieve.</td>
<td>Patient feels as though he/she is being listened to. Patient will appreciate the honesty and openness of the student. Patient may be able to see the student grow through this process.</td>
</tr>
<tr>
<td>• Faculty mentors assist students particularly in the cognitive components</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Halpern, 2014)</td>
<td></td>
<td></td>
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<tr>
<td>Model of Imperfections</td>
<td>A better understanding of the patient experience without having to try to find the solutions to every problem. Faculty help to relieve stress so student can focus on patient experiences and not their own.</td>
<td>Students seem more relaxed to patient and will be able to relate to the patient without trying to “solve” problems.</td>
</tr>
<tr>
<td>• Basic Science</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Faculty Mentors</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Patient Centered Curriculum</td>
<td></td>
<td></td>
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<tr>
<td>(Shapiro, 2008)</td>
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</tbody>
</table>
Chapter 4

Study Rationale/Program Description

This chapter provides a description of the LEAP program and how it relates to empathy. It describes how the program has been designed to promote a clearer understanding of the patient experience. In particular, it describes the history of the program at Weill Cornell Medical College and its integration into the new curriculum. A description of the patient experience, the monthly seminar sessions, and the establishment of mentors are also included. These components are considered essential to the program and to the development of empathy in medical students.

The purpose of this study was to examine the effects of a longitudinal patient program on the enhancement of empathy in first- and second-year medical students. LEAP is currently part of a new curriculum at Weill Cornell Medical College in New York City. As previously stated, one of the objectives of the program is to give students a clearer perception of the patient experience and enhance their ability to develop more empathy within the doctor/patient relationship. The expectation is that this objective will be achieved by having students develop long-term relationships with chronically ill patients. LEAP is a four-year longitudinal program designed to match students with chronically ill patients whom they follow throughout their four years of medical school. The most active component of the program takes place in the first two years when the students typically spend the majority of their time learning basic science concepts. In LEAP first- and second-year students are matched as dyad and share the same patients. Whenever possible, two different types of patients are assigned to each dyad. For example, a dyad will be assigned a pediatric and a geriatric patient. Another
example would be a dyad that is assigned a younger adult patient. Whenever possible, two different types of patients are assigned to each dyad. For example, a dyad will be assigned a pediatric and a geriatric patient. Another example would be a dyad that is assigned a younger adult patient with HIV and an older patient whose medical issues are related to aging. During their time in the LEAP program, students are required to make contact with each of their patients at least once a month. They are also required to do at least one home visit during the year with one of their patients (if the patient agrees). Other types of interactions vary depending on the patient. Interactions may include activities such as: accompanying a patient to an appointment or to a procedure (including surgery), meeting for coffee, sitting with the patient during chemotherapy or dialysis, and connecting by telephone to discuss relevant issues in the patient’s life. A telephone conversation is designed to be a last resort. Face-to-face interactions are always considered preferable.

Each month, first- and second-year students are expected to attend required seminar sessions. During the first year of the study, the seminar groups contained five or six dyads and were run by two faculty mentors who had different medical specialties. Students remain connected to these mentors throughout their time in LEAP. Mentors are available to the students for support when the students are coping with particularly difficult situations such as the death of a patient or dealing with a difficult patient.

The seminar sessions included discussions about experiences with patients. In the beginning of the session, a piece of literature or art would be used to help the students reflect on these experiences. Each month a different dyad made a presentation based on a chosen topic from the LEAP curriculum. Presentations centered around one of the dyad’s
patients. Although the dyad members presented issues relating to the same patient, the first-year student was responsible for covering a psychosocial topic such as health literacy, resilience, or the meaning of illness. The second-year student covered a biomedical issue related to the same patient such as diabetes medications or immunosuppression.

This format changed during the second year of this study. Based on student feedback, first- and second-year students were separated. The MS1s continued to present on the pre-determined psychosocial topics that had been used in previous years. The MS2s expressed a need for topics that were more increase their readiness for their clerkship years. New topics were developed for the second-year seminars. They focused on topics related to the transition into the clinical years. These included topics such as medical mistakes, giving a diagnosis, and writing notes.

When students enter their clinical years (years 3 and 4), they are still connected with their LEAP patients but are no longer required to attend the monthly seminar sessions. They are asked to take a mentorship role for the first- and second-year students. At the time of the study, all the third and fourth year students had participated in LEAP during the pilot years. The mentorship is related to the relationship with the specific patients whom they share. Aside from providing support for the underclassmen, third- and fourth-year students are also expected to stay in touch with their patients, particularly when a patient is admitted to the hospital. Having completed two years of LEAP, the upper-class mentors are able to provide support and guidance for the students. They understand the experience and the issues that may arise. More importantly, the third- and fourth-year students still share the same patients as the students in their earlier years.
They understand the issues specific to the individual patients and can provide extra support for the first- and second-year students.

The faculty mentors provide a different type of support. As experienced professional physicians, they can offer a wider perspective gleaned from their years of clinical experience. New mentors are given a brief orientation at the beginning of the academic year. All faculty mentors are given an updated Faculty Mentor Facilitator’s Guide that provides very specific information about their role in the LEAP program.

The patient continuity, faculty mentors, and reflective group work have all been cited as successful methods for teaching empathy to medical students, particularly when combined into one program (Branch, 2015). This study examined whether LEAP, which contains all of these elements, is a successful method for teaching empathy. In addition, it measured the differences in empathy scores between different sub-groups of medical students. Because empathy is particularly important to the doctor/patient relationship, LEAP patients were also asked to evaluate their students’ ability to relate with empathy.

While there are many longitudinal patient programs being implemented in medical schools both in the U.S and internationally, most of these are third- and fourth-year clerkships and do not include students in their first and second years (Walters et al., 2012). This study provides data on a slightly less experienced population of medical students. This is a quasi-experimental, pre-test/post-test design. Although this study is quantitative, some qualitative data were used to support the testing data.
Chapter 5

Methodology

The methodology described in this section delineates how the study was designed to suit the parameters of the new curriculum. The populations were drawn from the first two cohorts of students exposed to this revised curriculum, which included an abbreviated second year.

Based on the literature on empathy, there are seven hypotheses described in this section outlining ways that time in LEAP could affect empathy in students with different characteristics.

Participants

The classes of 2018 and 2019 at Weill Cornell Medicine were the chosen participants for this study. These are the first two full classes to participate in the LEAP program as a requirement of the curriculum. This study was conducted in the academic year 2015-2016. At this time the class of 2019 was the first-year class and the class of 2018 was the second-year class. The class of 2018 had 101 students (50 men, 51 women). The class of 2019 had 106 students (57 men, 49 women). The students came from across the country with a variety of academic backgrounds and interests. In both classes there were slightly more science majors than humanities or social science majors (MS1-59%, MS2-58%). The mean score on the MCAT in both classes was 36, in the 95th percentile. The average age of the class of 2018 was 23.9 years and was 23.2 for the class of 2019. The MS2 class was the first to participate in a new curriculum at Weill Cornell Medical College and they were the first class to be enrolled in LEAP as a required course.
Measures

The Jefferson Scale of Empathy-student version.

The Jefferson Scale of Empathy-Student Version (JSE-S) was used to evaluate the students on their level of empathy. The JSE-S is a brief survey of 20 questions using a 7-point Likert Scale (Strongly Agree=7, Strongly Disagree=1) and can be completed in less than 10 minutes. Students receive a score ranging from 20 -140. Half of the items on the survey are positively worded (“Patients feel better when their physicians understand their feelings”) and half are negatively worded (“I believe that emotion has no place in the treatment of medical illness”) to ensure that the students are answering the questions thoughtfully. Higher scores reflect higher levels of empathy with patients. The reliability of this measure is confirmed by a Cronbach’s coefficient α of 0.80. Exploratory factor analytic (EFA) research determined that the focus of the JSE can be grouped into three silos. (Appendix A) These are “perspective taking,” “compassionate care,” and “walking in a patients shoes.” By using confirmatory factor analysis this latent variable structure was accurate (Hojat & LaNoue, 2014). A contrasted groups method was used to support the validity of the JSE. Throughout various administrations of the survey, women and physicians in people-oriented fields consistently scored higher. Correlations have also been found between scores on the JSE and another validated measure of reliability called The Interpersonal Reactivity Index (IRI). The three factors of the JSE were significantly correlated to the IRI subscales of “perspective taking” and “empathic concern.” There was not a significant correlation between the factors and the subscales of “personal distress” and “fantasy.” Hojat (2007) stated these are more related to his
definition of sympathy which does not come from a place of altruism and which does not serve a function in the doctor-patient relationship.

A concern with a self-reported survey such as the JSE is that the students will answer the survey items according to what they believe is the “correct” response, creating a social desirability bias. When examining the psychometrics of the JSE, Hojat et al. (2009) addressed the issue of social desirability bias in three ways. First, they administered the JSE in non-penalizing situations, explaining that the results were confidential and used only for research. Next, they looked at the pattern of relationships in their validity studies, particularly convergent and discriminant validities. They found that, if a social desirability bias was observed, it did not distort the relationships. Finally, they administered the JSE with other personality tests, including the Zuckerman-Kuhlman Personality Questionnaire (ZKPQ). They chose the ZKPQ because it is specifically designed to detect intentionally false responses. These tests were administered to 422 first-year students. Hojat et al. conducted an empirical study based on the data analyzed from the relationship of the scores on the JSE and the personality tests. They found that, even when a few students were found to give false responses, based on the ZKPQ, the research outcome remained virtually unchanged. They also used an ANCOVA to control for the effects of false answers by using scores on the ZKPQ as a covariate. They determined that the social desirability response bias does not have an effect on JSE results (Hojat, Gonella, Joseph, Maxwell, & Kaye, 2009).

Consultation and relational empathy (CARE) survey.

To determine how the patients perceive the students’ ability to show empathy, the Consultation and Relational Empathy (CARE) measure was administered. This is a short,
10-item survey (Appendix B). Patients are asked to rate students based on statements on a Likert scale from excellent to poor. The internal reliability was reflected with a Cronbachs coefficient $\alpha$ of 0.92. There was a high correlation with the Reynolds empathy measure (RES) ($r=0.85$) and the Barrett-Lennard empathy subscale (BLESS) ($r=0.84$). This measure is based on a broad definition of empathy that includes both emotional and cognitive components (Mercer et al., 2004).

**Personal Questionnaire.**

Students were also asked to complete a short demographic personal questionnaire that included questions about age, gender, academic background, and previous work experience. It also included questions about past life experiences that may affect empathy. Students were asked the following questions:

- **a)** Are you the first MD in your family?
- **b)** Did you take time off between college and medical school?
- **c)** Were you a Pre-Med/Science major in college?
- **d)** Have you had experiences with chronic illness in your family?

This was used to provide information on other variables that may have affected the level of empathic response of the students (Appendix C).

**Procedures**

The first LEAP session in the academic year 2015-2016 took place in September 2015. MS1sand MS2s were informed at the LEAP orientation that they would be asked to complete the JSE-S online and that their participation would be voluntary.
Students were given instructions on how to take the survey. They were told that they would be given unique identifiers to ensure confidentiality and that their identities would be known only by the program coordinator. They were assured that all information would be kept on an encrypted computer. Students were also informed that the purpose of the survey was for program evaluation and academic research. It was clearly stated that their participation would have no effect on their grades or assessment. The study received approval from the CUNY Institutional Review Board and as part of the Weill Cornell Medicine IRB for comprehensive research on the LEAP program.

All of the students were re-tested in June 2016. The MS1s had completed a year in the LEAP program. The academic year for the MS2s ended in December 2015, three months after the first administration of the pre-test. Originally, the MS2s were to be re-tested in December 2015; however, since only three months had passed since the previous administration not enough time had passed since the pre-test. Instead, the MS2s were re-tested in June 2016 after several months of clerkship and clinical activity on the hospital floor. A complication is that participation in clerkship activity may have created a confounding effect on the results. The existing literature indicates that empathy usually declines during the start of the clerkship years (Hojat et al., 2009). The expected result in this study, from LEAP participation, was a gain in empathy scores. Although their work in LEAP had ended, the students were informed that they should stay in contact with their LEAP patient and with the MS1 student on their team to provide some continuity for both. At the time that the post-test was administered, the class of 2018 had completed four to five months of clinical clerkships with the exception of the four MD/PhD students who had begun their research.
The students took the web version of the JSE-S. The website is administered by the Sidney Kimmel Medical College (SKMC) (formally Jefferson University Medical College). Students were given a unique identifier that was generated by the LEAP program coordinator. The names and identifiers were kept on an encrypted computer to ensure confidentiality. Students were aware that the program coordinator had access to the names connected to the identifiers (Appendix D). The office that administers the JSE-S created the exam based on the needs identified by the researcher conducting the study. The administrators of the survey included questions about career choice, gender, and age. Once the students submitted their responses, the administrators at SKMC scored the surveys and provided the reports. They included standard statistics such as the mean, standard deviation, range, mode, and quartiles in addition to a histogram displaying the distribution of scores for the entire group. They also provided individual scores for each student using the assigned identifier. An excel spreadsheet of the raw data was also provided. An additional report was requested that included scores based on gender and specialty choice. After the second administration of the exam, they also provided pre- and post-test comparisons. These data were used to determine whether there were significant changes in the post-test scores for both classes and within each of the groups.

In November 2017 a letter went out to all of the LEAP patients asking them to complete the CARE survey. They were asked to use this instrument to rate their perception of the empathy displayed by their second-year students. There was a letter accompanying the survey explaining that their participation was voluntary and that their responses would not be shared with the medical students (Appendix E). They were also assured that the information would be used for evaluation and research purposes only and
would not affect their students’ assessments. The responses were used to determine whether there was a correlation between the patients’ perception of the students’ empathy and the students gain scores on the JSE.

After the post-test students were asked to complete an additional questionnaire, created specifically for this study that asked the students to identify their age, work experience, experience with chronic illness, and possible career choice.

As part of the LEAP program, students are required to log their patient encounters. The logs contain the type of encounter, a patient’s initials and age, and a brief description of what occurred during the encounter and what issues may have arisen. The number of encounters for each student was counted. This information was used to see whether there was a correlation between the number of encounters and the scores on the empathy exam.

**Data Analysis and Hypotheses**

Using the raw data and excel sheets provided by the administrator of the JSE-S, independent sample t-tests were run to compare pre-test scores to see whether there were any significant differences in the empathy scores based on gender, age, or year in medical school. A one-way ANOVA was chosen to determine whether there were significant differences in the mean empathy scores of the medical students based on their specialty choices.

After the post-test, t-tests were run to compare the gain scores to determine whether any of the changes between the pre-test and post-test administrations were significant. The hypotheses for the study were as follows:
H1: MS2s, who have participated in the LEAP program for one year, will score higher on the JSE-S pre-test than the MS1s, who are just beginning the LEAP program.

In LEAP the extended patient experience, along with the ability to reflect upon and discuss the experience, provided tools for empathy enhancement (Branch, 2015). To test this hypothesis, the empathy scores were examined to determine whether there was a significant difference between the scores of students just entering LEAP (MS1) and the scores of those who had completed a year of LEAP (MS2). Because Weill Cornell Medical College (WCM) uses the same admissions standards each year, this provided a comparison of groups with comparable demographic and academic characteristics. An independent samples t-test was used to compare the scores between the two groups.

H2: After completing 1.5 years of the LEAP program, MS2 scores will be higher than they were after one year.

With the implementation of a new curriculum at WCM the academic year was shortened for the MS2s and now ends in December. In January or February the MS2s began their clinical years with the exception of MD/PhDs who began their research years. These students were no longer required to participate in the monthly seminar sessions for the LEAP program; however, they were directed to remain in contact with their LEAP patients and their MS1 LEAP team member. An independent samples t-test was used to determine whether there was a significant difference in empathy scores between the pre- and post-test scores for the MS2s.
H3: Female students will have higher empathy scores than male students on both the pre-test and the post-test.

The empathy scores of the students were compared using gender as the independent variable. As reflected in the literature, it was expected that female students would have higher empathy scores (Chen et al., 2012; Hegazi & Wilson, 2013; Hojat et al., 2009; Neumann et al., 2011; Newton et al., 2008). An independent samples t-test was used to compare the scores of the two groups after the pre-test administration.

To determine whether there was a significant difference in empathy enhancement between the genders, an independent sample t-test was used to compare gain scores after the post-test.

H4: Students who are interested in pursuing more generalist, people-oriented careers in medicine (e.g., internal medicine, pediatrics, geriatrics, family medicine) will score higher on the JSE-S than those who choose to specialize in more technology-based careers (e.g., surgery, radiology, anesthesiology).

Students were divided into four groups based on their responses to a question on specialty choice. The first group consisted of students interested in pursuing a generalist career and the second group consisted of students interested in more technology-based careers. The other two groups were “undecided” and “no answer.” A one-way ANOVA was used to determine whether there was a statistically significant difference among the four groups on both pre- and post-test scores. The empathy scores of the four groups were also evaluated to determine whether there was a significant difference in empathy enhancement between students interested in pursuing a generalist career and those planning to pursue specialties.
This hypothesis is based on the information provided in the literature concerning the difference in empathy levels of students pursuing different specialties (Chen et al., 2012; Hegazi & Wilson, 2013; Hojat et al., 2009; Neumann et al., 2011; Newton et al., 2008; Roberts, Warner, Moutier, Geppert, & Green Hammond, 2011; Whyte, Quince, Benson, Wood, & Barclay, 2013).

**H5:** Students who have had personal experience with chronic illness and disease either in themselves or in loved ones will have higher empathy scores than those who have had no experience with chronic illness.

Based on the answers to the personal background questionnaire, students were divided into two groups. The first group contained students who had had previous experience with chronic illness, and those who had had no experience comprised the second. The baseline empathy scores of the students who said that they had had previous personal experience were expected to be higher and show a greater increase in empathy after participating in the LEAP program.

**H6:** Older students will have higher scores than students who enter medical school straight from college.

The students were divided into five age groups by the administrators of the JSE exam. The majority of the students (71%) fell into the 22-24 years of age category. For the purposes of this study, the five groupings were collapsed into two groups. The groups were ≤2-24 (78%) and 25-33 (22%). An independent samples t-test was used to determine whether there were differences between these age groups on both the pre-test and on the gain scores.
There were also questions on the personal questionnaire related to age and experience. There is evidence that older adults exhibit higher empathy traits and, as a result, more pro-social behavior than their younger counterparts (Beadle, Sheehan, Dahlben, & Gutchess, 2013). Consequently, it was expected that older students would have higher empathy scores. The scores of students who entered medical school directly from college were compared with scores of those who did not.

H7: Patient perception of student empathy will be correlated with the students’ scores on the JSE-S.

To determine whether the students’ self-reported level of empathy was being reflected back to their assigned patients, the LEAP patients were asked to complete a survey designed to measure their perception of empathy in the relationship. Students with higher empathy scores should be able to reflect that back to their patients (Mercer et al., 2004). The survey was mailed out to the patients, and their responses were compared with the scores of their assigned students. An independent t-test was performed to determine whether there were differences in the CARE scores based on gender. The response rate was too low to perform a correlation.
Chapter 6

Results

Pre-Test Results

The students were informed that their participation in the study was voluntary.

A percentage of the students from each class elected to take the pre-test. The pre-test was completed by 61 MS1s (58%) and 44 MS2s (44%). There were 56 female students and 49 male students among them. The students were divided into 2 age groups. The age groups were ≤22-24 \((n=82)\) and 25-33\((n=23)\). The age distributions were comparable in both classes; the majority of students in both fell within the 22-24 year range.

Students were asked to state their specialty preference. Because of their lack of experience and knowledge at this point in their medical training, these data reflect their interest and are not predictors of their final choice. With more clinical experience their specialty choice will most likely change. A recent study done by the University of Chicago Pritzker Medical School of Medicine found that 69.2 % of medical students nationally switched specialties between 2012 and 2016 (Fischer, 2017). At the time of the pre-test, the majority of the students taking the survey stated their specialty preferences. Their choices varied throughout the 62 specialties ranging from the very general (e.g., Internal Medicine) to the very specialized (e.g., Reproductive Endocrinology). For the purpose of this study, the specialties were divided into four groups. These were Primary Specialties \((n=35)\), Technical Specialties \((n=27)\), Undecided \((n=37)\), and No Answer \((n=6)\).
**Year of Medical School (Time in LEAP Program)**

An independent samples t-test was run to determine whether there were differences in the empathy scores between the MS1s, who were just entering the LEAP program, and the MS2s, who had completed a full year of LEAP training. There was a homogeneity of variances as assessed by Levene’s Test for Equality of Variances $(p=.17)$. The MS1 students $(M=116.31, SD=8.61)$ scored higher than the MS2s $(M=115.84, SD=13.74)$. The difference between the scores of the two classes was not significant, $t(103) = .215, p=.83$.

**Specialty Choices**

A one-way ANOVA was conducted to determine whether there were differences in the mean empathy scores of students based on different specialty choices. There were four categories of specialty choices: Undecided $(n=37)$, Technical Specialty $(n=27)$, Primary Specialty $(n=35)$, No answer $(n=6)$. There was a homogeneity of variances as assessed by Levene’s test for Equality of Variances $(p=.97)$. The differences in the empathy scores between these groups were not significant $F(2,104) = 2.17, p=.12$.

**Age**

An independent samples t-test was run to determine the differences in the mean empathy scores of the two age groups, ≤22-24 $(n=82)$ and 25-33 $(n=23)$. There was a heterogeneity of variances as assessed by Levene’s test for Equality of Variances $(p=.021)$. The means for the two groups were: ≤22-24 $(M=115.52, SD=9.63)$, 25-33 $(M=118.22, SD=14.97)$. The differences in the means of the pre-test scores were not significant $r(27.3) = -.82, p=.42$.
Gender

An independent samples t-test was run to determine whether there were differences in the empathy scores between the males and females. There was a homogeneity of variances as assessed by Levene’s Test for Equality of Variances ($p=.66$). The female students ($M=119.32, SD=9.31$) scored higher than the male students ($M=112.44, SD=11.69$). This difference was significant $t(103)=3.35, p=.001$.

Post Test Results

The JSE post-test was administered at the end of the academic year in June 2016. Not all of the students who took the pre-test participated in the post-test administration. At the time of the post-test administration, 35 (57%) of the MS1s who took the pre-test agreed to take the post-test; 31 (70%) of the MS2s who took the pre-test agreed to take the post-test. At the time of the post-test, the MS1 students had completed a full year of LEAP. The MS2 students had completed 1.4 years. The gain scores were calculated and then used to examine whether there were differences due to time in LEAP, age, or gender.

Year of Medical School (Time in LEAP Program)

An independent samples t-test was run to determine whether the changes in the scores were significant between the MS1 and MS2 students. There was a homogeneity of variances as assessed by Levene’s Test for Equality of Variances ($p=.573$). Both groups had negative mean gain scores (MS1= -.54, $SD= 7.44$) and (MS2= -1.17, $SD=8.9$). The difference between empathy change in the two groups was not significant $t(64)=.314, p=.754$. 
Specialty Choices

It was not possible to compare empathy scores based on specialty choices because 80% of the respondents did not answer this question on the post-test. This low response rate contrasts sharply with the pre-test, when 95% of the students stated a specialty preference.

Age

An independent samples t-test was conducted to determine whether the differences in the change of empathy scores between the two age groups were significant. As noted above, the groups were: <22-24 (N=53) and 25-33 (N=13). There was a homogeneity of variances as assessed by Levene’s Test for Equality of Variances (p=.85). The mean scores of both groups were negative <22-24 (M= -.45, SD=7.91) and 25-33 (M= -2.31, SD=8.81). The difference between the means was not significant, t (64) = .74, p=.46.

Gender

An independent samples t-test was conducted to determine whether the difference in the change in empathy scores between the two genders was significant. There was a homogeneity of variances as assessed by Levene’s Test for Equality of Variances (p=.638). The difference in the empathy change between the genders both significant and directional. The scores for the females students decreased (M= 119.32 pre-test, M=116.7 post-test.) The scores of the male students increased (M= 112.45 pre-test, M=114.84 post-test). The difference between the means of the gain scores was significant: Female (M= -2.63, SD= 7.62) and Male (M=1.23, SD=8.16), M= -3.85, t (64) =.2.0, p=.05. These scores are presented in Table 3.
The difference between the genders on the pretest scores was significant (*p<.05 (2-tailed) **p<.01(2-tailed)). Although the difference in the gender pre-test scores was significant, the difference between the post-test scores of the males (M=114.84, SD=10.40) and females (M=116.71, SD=9.84) was not significant. M=1.86, t (64) = .75, p= .455.
The differences in the pre and post test scores for each gender can be seen in Figure 1.

*Figure 1. JSE Scores by Gender*

CARE Survey

The Care Survey was sent out to 77 LEAP patients. There were 16 responses.

The survey consisted of 10 questions answered on a Likert scale. Patients were asked to rate statements about the perceived empathy of their LEAP students. The statements began with “How good was the practitioner at…” and the choices were “Poor,” “Fair,” “Good,” “Very Good,” “Excellent,” and “Does not apply.” There was a homogeneity of variances as assessed by Levene’s Test for Equality of Variances (p=.407). There was no significant difference in the scores by student gender, Female (N=10, M=80, SD=21.48), Male (N=6, M=91.6, SD=13.29), t (15) = -1.201, p=.25. However, there was a significant
gender difference in the CARE scores provided by the patients with females giving more positive ratings. (female (N=7, M=94, SD=9.59), Male (N=10, M=77.2, SD 21.9), t (15) =1.89, p=.08].

**Patient Logs**

Students were required to log patient encounters. Included in the log was the date of the encounter, the patient’s initials, the age of the patient, the length of the encounter, and a place for encounter notes. Logs could not be used to accurately measure the number of patient encounters for each student. The requirements for the number of submitted logs changed for each of the years. Many students did not log all of their encounters but only logged the number required to pass the course. Therefore, using the log encounters as a method of determining the amount of patient interaction for each students was not possible.

**Student Personal Background Questionnaires**

Requests for the Personal Background Questionnaires were sent out three times with an offer of a $5 Starbucks Card. Only nine students responded.

**Discussion**

The objective of this study was to determine whether a longitudinal patient-centered program would enhance empathy in first- and second-year medical students. Several studies have shown that empathy drops in the third year of medical school when
students begin their clinical clerkships (Chen et al., 2012; Hojat et al., 2009; Ward, Cody, Schaal, & Hojat, 2012), but there has been very little focus on how to increase empathy in the preclinical years. With the implementation of the LEAP program at WCM students in the first and second years were given the opportunity to develop relationships with chronically ill patients. Previously, they had had little to no opportunity to be involved with individual patients over an extended period of time. Their experience had been limited to short, brief snapshots of a patient’s experience obtained through time in a preceptor’s office or in physical diagnosis sessions. The longitudinal nature of the LEAP program provided students an opportunity to understand the perspective of the patient through their interactions in a more profound way than through textbooks or lectures.

Empathy was measured using the Jefferson Scale of Empathy, a test developed by Sidney Kimmel Medical College that has been used extensively around the world to measure empathy in physicians, students, and other health care professionals. The pre-test was administered in September 2015 to the class of 2018 (MS2s) and the class of 2019 (MS1s). The MS1s served as the comparison group for the pre-test since they had not yet begun the LEAP program. The age, gender, and background of both classes were similar since they had both been accepted using Weill Cornell admissions standards and qualifications.

The research questions focused on how participation in the LEAP program affected empathy in medical students, as measured by the JSE. The effects of LEAP participation were examined in relation to four participant characteristics: (1) medical school year (time in LEAP), (2) age, (3) career interest, and (4) gender. The post-test did not include career interest because so few students answered the question at that time.
Gender was the only characteristic differentiating students’ JSE scores significantly on both the pre-test and the post-test. Based on the data obtained in this study, the changes in the empathy levels of the male and female students differed significantly. There were no significant differences in empathy scores when students were grouped by age, year of medical school (time in LEAP), or specialty choice. Most research data have shown that empathy does tend to decrease throughout medical school. The third year of medical school, when students begin their clerkship rotations, is typically where the decline of empathy begins (Hojat et al., 2009).

**Medical School Year**

It was impossible to obtain a true control group for this study. As it was a requirement of the curriculum, LEAP could not be provided to one portion of the class and not to another. The incoming class of students (MS1s) served as the comparison group for the initial administration of the JSE since they had not yet participated in the LEAP program.

At the time of the pre-test administration, the second-year students had completed a full year of the LEAP program. In addition to the year in LEAP, over the summer many of the MS2 students remained in New York for research or for residence and were able to maintain contact with their patients when classes were not in session. Although the summer contact was not as consistent as it was during the year, each year many of the students managed to have some form of contact with their patients before the beginning of the new academic year. There was no way to get an exact number of students who remained in New York. Often the students only left for a short amount of time and then
returned to New York. This additional time in the LEAP program and the time spent with patients over the summer should have had a positive effect on the development of patient-student relationships. The expectation was that this would have a positive effect on the pre-test scores, particularly in comparison with the MS1s with no experience. However, the results reflected no significant difference.

Although the MS1 and MS2 classes were similar in many ways, there were some differences in the experiences of the two classes that may have been confounding factors. At the start of the study, MS2s who had completed a year of the LEAP program were the experimental group. The MS2 students (Class of 2018) were the first class to participate in newly implemented curriculum at WCM. They may have differed from other classes because they chose to come to WCM knowing the curriculum was new and untested and were willing to take the risks. Other students may have elected to wait until the curriculum had been assessed and established, or they chose to attend a different school. This separates the MS2s as a particular group of students with different personalities and dispositions. As the class that pioneered the new curriculum, they had experiences and stresses during their first year of medical school that were not typical of most classes. When the class of 2018 began participating in the new curriculum, they were asked to provide a thorough assessment of almost every aspect of the curriculum. The students were asked to complete a survey after almost every single lecture, participate in focus groups, and provide extremely thorough and lengthy course evaluations. In addition, they took it upon themselves to create their own class surveys, because they felt that the faculty surveys did not address all of their concerns. The MS2 students were subjected to many more surveys than a typical medical school class encounters. This all may have
been a distraction from their patient interactions. Participation in this current study, although voluntary, meant completing an additional survey and providing more information about themselves.

In contrast, the class of 2019 was not asked to complete all the surveys and evaluations that had been administered the previous year. They also benefited from many of the changes that were made in the curriculum based on the suggestions of the 2018 class. They did not experience the same stresses and frustrations as the students in the preceding class. The differences in the experiences of the two groups may have been a contributing factor in the findings. Stress has a negative effect on empathy (Neumann, 2011). Without the stress of the new curriculum, the MS2 students might have scored higher on the JSE.

The post-test was administered in June 2016. The data obtained from the pre-test and post-test indicated no significant difference in the change in the scores for the second-year students after completing 1.4 years of LEAP. It is worth noting that, although the program ended after the first semester of the academic year for the MS2s, the students only participated in LEAP for three extra months before moving on to their clinical activities. At the time of the post-test administration, the MS2s had been active in their clinical clerkships for five or six months, with the exception of four students who were MD/PhD students and went straight into research. Some students opted to go immediately into clerkships, while others chose to take six weeks to study for the boards. In this particular class many students changed their minds about the decision to take advantage of the study time, making it difficult to determine their actual starting dates. All of the students had been active in clerkships for at least four months when the post-
test was administered. Much of the research in medical education has found that the largest decline in empathy occurs between the second and third years of medical school, specifically when students begin their clinical years (Hojat et al., 2009). The students in this study did not display the typical decline in empathy. Their participation in LEAP may have attenuated the decline in empathy that typically occurs during this period of training (Neumann et al., 2011). Further research should be done to determine the effects of LEAP as medical students progress into their years of clinical training. Unfortunately, because LEAP is now a required course, it will be impossible to get a true control group among students enrolled in clerkships

**Gender**

Research findings using the JSE have been fairly consistent in reporting that females typically have higher empathy scores than males (Hojat et al., 2002). The reason for this difference has never been fully explained. One explanation often offered is that the reason females are better able to respond to emotional signals is that, based on evolutionary theory, they develop more caring attitudes towards their offspring (Hojat et al., 2002). The data on the pre-tests support this hypothesis. The females in this study did score significantly higher than the males on the pre-test. After participation in the LEAP program, however, the JSE empathy scores for the female participants decreased, while there was an increase in the scores of the male students. There was no significant difference in the empathy scores between the two genders after the post-test.

The existing literature provides considerable information that might explain the decline in the empathy scores of the female students. First, the decline may be the result
of the stress of first two years of medical school. Stress, depression, and anxiety all have a negative impact on empathy in both doctors and medical students. The first year of medical school can be particularly stressful for the female students (Saravanan & Wilks, 2014).

The reality of facing morbidity and mortality may have caused distress in the female students who scored significantly higher on the JSE at pre-test. The greater empathy of the female students, which may have been more emotional (sympathy) than cognitive, may have created a need to distance themselves from the patients by using so-called detached concern and decreased empathy so that they could continue to maintain a relationship with their chronically ill LEAP patients and focus on their difficult basic science course work (Halpern, 2014).

While interaction with chronically ill patients can create distress, there are other aspects of medical school that can also be particularly stressful for female students such as implicit gender bias (Blanch, Hall, Roter, & Frankel, 2008). Distress has been shown to be a major cause of empathy decline, while empathy is associated with a positive sense of well-being (Neumann et al., 2011).

Saravanan and Wilks (2014) also found that female medical students experienced greater anxiety than males. In addition, while they found that depression was prevalent for all students through all four years of medical school, the highest prevalence occurred during the first year. This is possibly due to the transition that occurs from college to medical school and all of the stress which that entails.

According to Blanch, Hall, Roter, and Frankel (2008), when entering medical school females tend to be less anxious, more confident, and have better mental health.
However, at the end of the first year, anxiety is significantly increased in the female students while it decreases in the male students. This finding parallels the changes in the JSE empathy scores as the females scored significantly higher on the pre-test but had a decrease in their scores on the post-test. In contrast, the male scores showed an increase that was significantly different from the change in the scores of the female students.

In addition to the anxiety of work and life transition, much of the stress of the female students is due to self-doubts in their abilities and in their competence. Females reported much higher stress related to academic performance than their male counterparts, whose main area of stress seemed to be adjusting to living away from home (Blanch et al., 2008).

Another factor that may have affected the empathy of the female students is gender bias. Implicit gender bias may have been conveyed in the relationships between the female students and their LEAP patients, specifically in situations where empathy was expressed. This bias occurs in patient interactions between female physicians and their patients. Female doctors displaying high patient-centered behaviors such as empathy find that it is not valued by the patient as strongly as it is in male doctors. Empathy is an expected trait for women and is taken for granted. Empathy in male doctors, however, is highly valued and appreciated. Male doctors and by extension male medical students get more positive feedback when expressing empathy to their patients (Hall, Gulbrandsen, & Dahl, 2014).

Hall and colleagues (2014) state, “If female physicians do not consistently receive credit for their patient-centeredness in the eyes of patients (or their peers or superiors), this could lead female physicians to adopt less patient-centered behavior.” Female
students may not have received the same positive reinforcement for demonstrating empathy as their male counterparts. The additional stress of the foundational years for female students paired with a lack of positive reinforcement for expressing empathy may be contributing factors to the decline in empathy in female students in the pre-clinical years of medical school.

Much of the literature on medical education focuses on the decline in empathy during the third and fourth years of medical school when students begin their clinical clerkships. The reasons for the decline during these years include a lack of role models, a high volume of materials to learn, time pressure, and the stresses that occur with patient care (Hojat et al., 2009). There is a dearth of literature on empathy in the first two years of medical school, which traditionally had been dedicated to a basic science curriculum. Now, with more patient-centered curricula being added to the foundational years, more research in empathy in the pre-clinical years is necessary.

Age

Because almost 75% of the students fell into the 22-24 age group, there was no real difference in the ages of the participants, and therefore the scores were also not significantly different. The low number of students in the other age groups diminished the likelihood of identifying group differences that may exist in the broader population of medical students.

Specialty Choices

The choices of specialties made by the students on the pre-test survey were widely scattered throughout the various options. The results were not significant; however, it
would be useful to have the students re-take the survey at the end of their clerkships to see not only how their empathy scores had changed but also what they identified as their career choice at the beginning of medical school and their choice at the end of it. Students are much clearer about their career choices at the end of medical school. On the post-test administration 87% of the students chose not to answer the question at all. It is probable that their answers had not changed and that they may have felt it was unnecessary to answer. They also may have felt more uncertain about their answers after a year of medical school.

Logs

Using student logs as a method of measuring the number of patient encounters was not an effective way to measure patient contact. The number of encounters logged by students was variable. Some students chose to log all of their encounters, while others found it to be a chore and logged only the number of encounters needed to meet the requirements of the course. This made the quantity of the logs entered by different participants a very ineffective measure of the amount of patient contact for each student.

During their first year of LEAP, MS2 students were required to submit monthly logs. They were told to submit 2 patient encounters per month. That requirement was changed the following year, when the MS1 students began the LEAP program. At this time, students were asked to enter at least three meaningful patient encounters logs for each semester. As a result, the number of logs submitted by MS2s was higher; however, their logs were lower in quality, presumably written only so that they could achieve the required number of log entries.
More important than the quantity of the logs is the quality of what was written. Many of the logs entries were short and filled with medical facts. Other log entries made it clear that students took the time to speak with their patients about their thoughts and feelings. For example, this log entry is from a student whose JSE score increased 6 points between the pre-test and post-test administrations:

Called xx to check in. She told me that she was suffering from lower back pain, which prevents her from walking and has significantly impaired her quality of life. We talked about this pain, impact and treatment (she is taking prescribed Percocet) for a long while xx felt that her pain was not being taken seriously by her PMD. She was also frustrated by persistent menstrual bleeding (since October 1st); she began taking birth control 3 weeks ago, but this has not helped. xx stated "I feel too young to deal with all this. My whole body hurts." She did seem happier at the conclusion of our conversation, however.

In contrast, this an entry from a student whose empathy score decreased by 5 points between the pre-test and post-test administrations:

She has been struggling with some sort of erythema and dermatitis of unclear origin. It seems a very stressful situation because a clear diagnosis and, hence, treatment is not possible. I will be attending her upcoming appointment to see if there has been any progress on the matter.
Reviewing log entries is not a perfect method to evaluate a student’s capacity for empathy since students who have personal conversations with their patients may choose not to report them in the log. In spite of this, there were a fair number of log entries that did indicate expressions of empathy by the medical students who submitted them.

**Personal Questionnaire**

Although only nine students responded to this questionnaire, there were some observations that would be interesting to explore with a larger sample. In this smaller group it appears that the older students had larger decreases in their empathy scores. When the survey was designed, it was expected that students who had family members with chronic illness would have higher scores on the JSE than students who did not. Among the nine responding students there were five who had decreased empathy scores after the post-test administration. All five of these students reported having had family members with chronic illnesses. Although they had lower post-test scores, the pre-test scores of all five of these people were several points above the mean. Based on this very limited sample, students with chronically ill family members came into the LEAP program with higher empathy skills. These skills may have been a result being part of a family who had to cope with the issues of chronic illness. After their experiences with the LEAP patient-teachers, all of these students had decreased scores. The longitudinal program may not have been necessary for them to learn empathy because they had their own personal experience. Based on this limited sample, they may have over-identified with the pain of their patients creating discomfort; therefore, the score of this group of students all decreased in spite of their higher pre-test scores. Since this sample was so small, further research would be needed to draw any conclusions.
CARE Patient Survey

The CARE survey was sent to 77 LEAP patients; 17 patients responded. The patients all received instructions explaining that their responses were confidential and would not be shared with their students. They were also told that the survey was solely for research and course evaluation purposes and would have no effect on the students’ academic record. A letter using a template provided and approved by the CUNY IRB was sent along with this survey explaining this to the patient (Appendix E). In spite of this, many patients expressed concern about evaluating their students because they did not want to be responsible for affecting their grades. The responses that were provided were overwhelmingly positive, with 40% of the students receiving a perfect score. The fear of providing a negative evaluation that could harm the student did create a social desirability bias, and that may be the reason others did not respond. In addition, many patients become extremely attached to their students. These patients were more likely to respond, creating a response bias. A correlation between the results of the CARE surveys and the gain scores of the students could not be obtained because of the small response rate. To determine whether there was a difference in the perception of empathy based on the gender of the student, an independent samples t-test was conducted. There was no significant difference between the scores of the male and female students. To determine whether there was a difference in the scores based on the gender of the patient, another independent t-test was conducted, and the female patients rated the students significantly higher. The reason for these higher scores is difficult to determine; however, there is some literature that suggests that female patients spend more time with their physicians by asking more questions, using more “emotionally concerned statements,” and putting
more effort into the doctor-patient relationship (Bertakis, 2009). Since women are more receptive to emotional interactions, particularly empathy, the survey would be easier for the women to answer. The female patients may have been more attuned to the empathy expressed by the medical students.

**Summary**

Only one of the hypotheses outlined in this study was supported. The pre-test results did support the fact that women were more empathic than men. Their scores on the JSE were significantly higher than their male counterparts. All of the other hypotheses that included other characteristics such as age, year of medical school/time in the LEAP program, and program specialization were not supported by the results of the study.

Based on the results of the personal questionnaire, the hypothesis that people who have had personal experience with chronic illness would score higher on the JSE than those who had not was not proven. Unfortunately, so few people answered this questionnaire, that this hypothesis should be retested with a larger population to get a valid result.

An overview of the results of the study is found below in Table 4.
Table 4.

Summary of Main Study Hypotheses

<table>
<thead>
<tr>
<th>Number</th>
<th>Hypothesis</th>
<th>Evidence For/Against</th>
<th>Supported/Not</th>
</tr>
</thead>
<tbody>
<tr>
<td>H1</td>
<td>MS2s who have participated in the LEAP program for one year will score higher than the MS1s on the JSE-S pre-test.</td>
<td>An independent samples T-test revealed that there was no significant difference between the MS1s and MS2s on the JSE pre-test.</td>
<td>Not Supported</td>
</tr>
<tr>
<td>H2</td>
<td>After completing 1.5 years of the LEAP program MS2 scores will be higher, than they were after one year.</td>
<td>A general linear model was used to conduct a repeated measures ANOVA which revealed there was no significant difference between students who completed one year of LEAP and those who completed 1.5 years</td>
<td>Not Supported</td>
</tr>
<tr>
<td>H3</td>
<td>Female students will have higher empathy scores than male students on both the pre-test and the post-test.</td>
<td>An Independent samples T-test revealed that female students scored significantly higher than male students on the pre-test. A general linear model was used to conduct a repeated measures ANOVA which found that there was no significant difference between male and female students on the post test.</td>
<td>Pre-test: Supported; Post-test: Not Supported</td>
</tr>
</tbody>
</table>
Table 4 (cont’d.)

**Summary of Main Study Hypotheses**

<table>
<thead>
<tr>
<th>Number</th>
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<th>Evidence For/Against</th>
<th>Supported/Not Supported</th>
</tr>
</thead>
<tbody>
<tr>
<td>H4</td>
<td>Students who are interested in pursuing more generalist, people-oriented careers in medicine (internal medicine, pediatrics, geriatrics, family medicine) will score higher on the JSE-S than those who choose to specialize in more technology based careers (surgery, radiology, anesthesiology).</td>
<td>A one way NOVA revealed that there was no significant difference in the empathy scores of students who prefer generalist specialties over those who are more interested in technology based careers.</td>
<td>Not Supported</td>
</tr>
<tr>
<td>H5</td>
<td>Students who have had personal experience with chronic illness and disease either in themselves, or in loved ones, will have higher empathy scores than those who have had no experience with chronic illness.</td>
<td>Descriptive statistics on the personal questionnaire demonstrated that students with personal experiences with chronic illness scored higher on the JSE pre-test.</td>
<td>Supported (however with such a low N, this needs to be researched further).</td>
</tr>
<tr>
<td>H6</td>
<td>Older students will have higher scores than students who enter medical school straight from college.</td>
<td>A repeated measures ANOVA revealed that there were no significant differences in the JSE empathy scores among students of different age groups.</td>
<td>Not Supported</td>
</tr>
<tr>
<td>H7</td>
<td>Students with a higher frequency of patient encounters will have a greater increase in empathy than those who do not or cannot see their patients as often.</td>
<td>A Pearson Correlation was run to determine if there was a positive relationship between the number of logged patient encounters and a student’s empathy scores.</td>
<td>Not supported</td>
</tr>
</tbody>
</table>
Study Limitations

There are several limitations to this study. Because of the shortened academic year for the second-year students, their post-test results only reflected a difference of three months in terms of participation in the LEAP program. Since they took the post-test in June along with the first-year students, they had already begun their clinical rotations, and that may have had an effect on their scores.

Because of the curriculum requirements there was no true control group. There are several confounding effects of not having a true control group. While the classes are similar demographically, there are differences that may have affected the results. In particular, the fact that the class of 2018 was the pioneer class of the new curriculum created a different set of experiences than those undergone by the class of 2019. There were also minor changes made in the LEAP program; hence, the first years were slightly different for each class. For example, the log requirements were decreased for the MS1 class. After the administration of the post-test, both groups had had some exposure to LEAP. If there had been a true control group, there would have been a group that did not participate in the program at any time. Despite these issues, at the time of the pre-test, the MS1s still had not yet started the LEAP program, nor had they even met their patients. This did provide a comparison group for the MS2 students, who had a year’s experience in the program. While it is not ideal, for the purposes of this study, the use of the MS1 group as a quasi-control group provided some point of comparison for the MS2 (experimental) group.

This study covered only first- and second-year students. To determine the long-term effects of a program such as LEAP, a more longitudinal study would need to be
conducted. In particular, to conclude whether LEAP can attenuate the decline in empathy typically seen during residency and clerkships, LEAP students would need to be re-tested during their fourth year and after their internship and compared to students who had not participated in the LEAP program.

The small response rate for the additional surveys is also a limitation. Medical students are extremely busy, and asking them to give up even a small amount of time is not easy. They are far more likely to take an on-line survey such as the JSE than one that is written in hard copy and asks for more detailed information. The incentive of a Starbucks card was not effective. Since the incentive cannot be tied to grades or coursework, it is difficult to think of something that would appeal to and motivate them.

While the response rate for the CARE surveys can also be considered a limitation, it was not surprising. Chronically ill patients are often not likely to answer correspondence sent by the LEAP office. Those who did answer were people who seemed very impressed with their students. Others were concerned about how their response it might affect the “grade of their students. Two patients called the LEAP office to provide additional positive information that they wanted to have included in their student’s record. There was only one survey with a less than positive response. If this study were to be repeated, a different method of obtaining the perspective of the patients should be considered.

A multi-institutional study comparing changes in empathy scores with clerkship students from other medical schools that do not have a patient-centered longitudinal program in the foundational years would provide a more accurate picture of the effects of LEAP on students in their clinical years.
Participation bias may also have affected the results of the study. Students were told that their participation was voluntary. The differences between those who chose to participate and those who did not may have changed the results significantly.

**Conclusions**

As longitudinal programs increase in medical schools, similar studies should be done to determine whether these programs are effective in the teaching of empathy and, if they are, whether some types programs are more effective than others. The majority of these programs are longitudinal clerkships, and only a small percentage of them are being used in the pre-clerkship years. The effectiveness of teaching empathy by introducing medical students to these programs in their pre-clinical years needs further research.

More importantly, empathy needs to be integrated into the curricula of more medical schools. Its importance in the field of medicine cannot be dismissed. It promotes better clinical outcomes; decreases burnout; and, of course, increases patient satisfaction. Historically, it is only in recent years that medical schools have actively begun including programs that specifically teach or emphasize the importance of empathy in their curricula. Empathy can be taught by teaching the cognitive dimensions (sharing feeling), affective dimensions (perspective taking), and behavioral dimensions (empathic behavior) (Jeffrie, 2016). LEAP is designed to teach all of these dimensions. By speaking with their patients on a monthly basis and questioning them on each of the monthly topics, medical students should begin to see things from the perspective of the
patient. They will see the patient encounter situations and problems they may have never considered before the establishment of their relationship with a chronically ill person. Many students develop feelings for their patients beyond just the clinical relationship. They get to know their families and their caregivers. The feelings they have watching these people deal with illness may help them as clinicians, but it may also cause them to burn out if they take on the pain without having set or being given appropriate boundaries. Behavioral empathy is primarily taught throughout the medical school curriculum. Students learn how to speak to patients and how to demonstrate empathy. While the results of this study did not show conclusive results that LEAP is an effective way to teach empathy, it is a way to start a foundation for exploration in other areas of the curriculum. It may also be a way of reversing the typical decline in empathy that occurs during the clinical years. Programs like LEAP combined with other programs focused on humanistic medicine could provide a broad-based approach to teaching empathy in medical school. Although, empathy and patient-centered activities are taught throughout the curriculum, LEAP furthers the process of engaging the student through ongoing interaction with an actual patient. Students are not just learning about empathy, they are participating in a medical environment while learning empathy. While courses teaching about empathy and the doctor-patient relationship have an increasing presence in medical school curricula, the advantage of a program such as LEAP is that students learn by being engaged in a patient’s experience of illness that allows them to experience medicine empathetically.
Appendices
# Appendix A

Psychometric Item Analysis for the Jefferson Scale of Empathy: Rotated factor pattern.

(M. Hojat & LaNoue, 2014)

<table>
<thead>
<tr>
<th>Item</th>
<th>Factors</th>
<th>Item-total score correlationa</th>
<th>Discrimination index effect sizeb</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Factor 1</td>
<td>Factor 2</td>
<td>Factor 3</td>
</tr>
<tr>
<td>Patients value a physician’s understanding of their feelings which is</td>
<td>0.66</td>
<td>0.02</td>
<td>0.01</td>
</tr>
<tr>
<td>therapeutic in its own right (10)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Physicians should try to stand in their patients’ shoes when</td>
<td>0.64</td>
<td>-0.05</td>
<td>0.02</td>
</tr>
<tr>
<td>providing care to them (9)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Physicians should try to think like their patients in order to</td>
<td>0.61</td>
<td>-0.15</td>
<td>0.00</td>
</tr>
<tr>
<td>render their care better care. (17)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Physicians’ understanding of the emotional status of their patients,</td>
<td>0.46</td>
<td>0.29</td>
<td>0.00</td>
</tr>
<tr>
<td>as well as that of their families is one important component of the</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>physician-patient relationship. (18)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I believe that empathy is an important therapeutic factor in medical</td>
<td>0.44</td>
<td>0.26</td>
<td>-0.02</td>
</tr>
<tr>
<td>treatment. (20)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Patients feel better when their physicians understand their feelings</td>
<td>0.44</td>
<td>0.00</td>
<td>0.03</td>
</tr>
<tr>
<td>(2)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Physicians should try to understand what is going on in their patients</td>
<td>0.40</td>
<td>0.17</td>
<td>0.04</td>
</tr>
<tr>
<td>minds by paying attention to their non-verbal cues and body language</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(13)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Empathy it’s a therapeutic skill without which the physician’s success</td>
<td>0.36</td>
<td>0.20</td>
<td>-0.04</td>
</tr>
<tr>
<td>is limited (19)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Understanding body language is so important as verbal communica-</td>
<td>0.30</td>
<td>0.09</td>
<td>0.08</td>
</tr>
<tr>
<td>tion in physician-patient relationship. (6)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>A physician’s sense of humor contributes to a better clinical</td>
<td>0.29</td>
<td>0.03</td>
<td>0.00</td>
</tr>
<tr>
<td>outcome. (6)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Patient’s illnesses can be cured only by medical or surgical</td>
<td>0.63</td>
<td>0.59</td>
<td>0.01</td>
</tr>
<tr>
<td>treatment; therefore, physicians’ emotional ties with their patients</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>do not have a significant influence in medical or surgical treatment.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(11)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I believe that emotion has no place in the treatment of medical</td>
<td>0.23</td>
<td>0.54</td>
<td>0.04</td>
</tr>
<tr>
<td>illness. (14)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Attentiveness to patients’ personal experiences does not influence</td>
<td>0.01</td>
<td>0.52</td>
<td>0.05</td>
</tr>
<tr>
<td>treatment outcomes. (8)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Asking patients about what is happening in their personal lives is</td>
<td>0.03</td>
<td>0.49</td>
<td>0.00</td>
</tr>
<tr>
<td>not helpful in understanding their physical complaints. (12)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Physicians’ understanding of their patients’ feelings and the</td>
<td>0.04</td>
<td>0.40</td>
<td>-0.09</td>
</tr>
<tr>
<td>feelings of their patients’ families does not influence medical or</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>surgical treatment. (1)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Attention to patients’ emotions is not important in history taking.</td>
<td>0.01</td>
<td>0.48</td>
<td>0.09</td>
</tr>
<tr>
<td>(7)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I do not enjoy reading non-medical literature or the arts (10)</td>
<td>0.00</td>
<td>0.25</td>
<td>0.00</td>
</tr>
<tr>
<td>Physicians should not allow themselves to be influenced by strong</td>
<td>-0.02</td>
<td>0.21</td>
<td>0.01</td>
</tr>
<tr>
<td>personal bonds between their patients and their family members. (18)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Because people are different, it is difficult to see things from</td>
<td>-0.05</td>
<td>0.06</td>
<td>0.75</td>
</tr>
<tr>
<td>patients’ perspectives. (6)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>It is difficult for a physician to view things from patients’</td>
<td>0.06</td>
<td>-0.05</td>
<td>0.88</td>
</tr>
<tr>
<td>perspectives. (5)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*a* Principal component factor analysis with oblique rotation was used for approximately half of the sample (n=1382). Confirmatory factor analysis was performed for the other half of the sample to examine the factor model.

*b* Partial correlations between scores on each item and JSE score by excluding the corresponding item score from the total score. Item-total score correlations and discrimination indices were calculated based on data for the entire sample (N=2192). For calculation of the effect size estimates of discrimination indices, the item mean scores for JSE high scorers (above 75%) and low scorers (below 25%), yielded by the partial correlation of the corresponding item.

**Note:** r<0.05 for all but the reported correlations.
Appendix C

<table>
<thead>
<tr>
<th>How good was the practitioner at...</th>
<th>Poor</th>
<th>Fair</th>
<th>Good</th>
<th>Very Good</th>
<th>Excellent</th>
<th>Does not apply</th>
</tr>
</thead>
<tbody>
<tr>
<td>1) <strong>Making you feel at ease</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(introducing him/herself, explaining his/her position, being friendly and warm towards you, treating you with respect; not cold or abrupt)</td>
<td></td>
<td></td>
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<tr>
<td>2) <strong>Letting you tell your &quot;story&quot;</strong></td>
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<td></td>
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</tr>
<tr>
<td>(giving you time to fully describe your condition in your own words; not interrupting, rushing or diverting you)</td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>3) <strong>Really listening</strong></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>(paying close attention to what you were saying; not looking at the notes or computer as you were talking)</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>4) <strong>Being interested in you as a whole person</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(asking/knowing relevant details about your life, your situation; not treating you as &quot;just a number&quot;)</td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>5) <strong>Fully understanding your concerns</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(communicating that he/she had accurately understood your concerns and anxieties; not overlooking or dismissing anything)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6) <strong>Showing care and compassion</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>(seeming genuinely concerned, connecting with you on a human level; not being indifferent or &quot;detached&quot;)</td>
<td></td>
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<tr>
<td>7) <strong>Being positive</strong></td>
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<tr>
<td>(having a positive approach and a positive attitude; being honest but not negative about your problems)</td>
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<td></td>
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<tr>
<td>8) <strong>Explaining things clearly</strong></td>
<td></td>
<td></td>
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<td></td>
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</tr>
<tr>
<td>(fully answering your questions, explaining clearly, giving you adequate information; not being vague)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9) <strong>Helping you to take control</strong></td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(explaining with you what you can do to improve your health yourself; encouraging rather than &quot;lecturing&quot; you)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10) <strong>Making a plan of action with you</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(discussing the options, involving you in decisions as much as you want to be involved; not ignoring your views)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Comments: If you would like to add further comments on this consultation, please do so here.

© CARE SVW Mercer, Scottish Executive 2004. The CARE Measure was originally developed by Dr. Stewart Mercer and colleagues as part of a Health Service Research Fellowship funded by the Chief Scientist Office of the Scottish Executive (2000-2003).
Questionnaire

Identification Number: College Major___________

Medical Student________ MD/PhD Student________

Age________

Did you start medical school immediately after college? Yes____No____

Were you employed before starting medical school? Yes___No____

Have you ever suffered from a chronic illness? Yes___No____

Has anyone in your family ever suffered from chronic illness? Yes___No____

Do you have a graduate degree? Yes___No____

If so, please describe_______________________

What area of medicine, if any, do you plan to pursue as a Career?______________________________
Appendix D

Student Instructions

One of the important objectives of the LEAP program is to promote physician empathy. We would like to determine the effectiveness of LEAP in meeting this objective. Please use the link below to take a survey on physician empathy. Use the student number provided to you. Your responses will be kept confidential. Only the LEAP program coordinator will have access to your identity. In addition to evaluation of the LEAP program, your confidential responses may also be used for research. Your responses will in no way affect your assessment or your grade in the LEAP program.

Appendix E

Patient consent
Dear LEAP Patient-Teacher,

As always, we appreciate your willingness to participate in our program by sharing your experiences as a patient with our medical students. We are hoping that these experiences are helping to form future physicians who are more empathic and have a better understanding of the patient perception.

We are interested in knowing how you perceive our students ability to empathize with you and your experiences. If you can, please take a few minutes and fill out the enclosed form. We will not share your responses with the medical students. We are only using this information to evaluate the effectiveness of this program.

If you are willing to participate in this study please sign below. If you have any questions or concerns, please contact Susan Kane, 212 746-6113.

I understand that my responses will be kept confidential and will not be shared with any of the medical students. The information will be used strictly for program evaluation.

Print Name_______________________________________________

Signature__________________________________________________


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doi:10.5116/ijme.533f.0c41


doi:10.3402/meo.v17i0.18899

doi:10.1016/j.pec.2011.01.009


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doi:10.1097/ACM.0b013e318209897f


doi:10.1111/j.1365-2923.2011.04152.x


