CEO (OSTEOPATHIC STUDIES) INC
HALIFAX PROGRAM

THE PRINCIPLE, 'THE ROLE OF THE ARTERY IS ABSOLUTE' IN OSTEOPATHIC PRACTICE, A QUALITATIVE STUDY

by
HEATHER PIERCE CORMIER

APRIL 2017
THESIS
PRESENTED BEFORE A JURY

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RESEARCH QUESTION

How are Canadian osteopaths incorporating the principle, “the role of the artery is absolute” in their practice?

ABSTRACT

Research indicates that the majority of expert Canadian osteopathic manual practitioners incorporate the osteopathic principle, “the role of the artery is absolute” in their practice. An overwhelming majority address the liquids and fluids of the body in treatment. This qualitative grounded theory study was designed to explore, with a purposive sampling of 10 expert Canadian osteopathic manual practitioners, their perceptions of the osteopathic principle, “the role of the artery is absolute.” The goal of the study is to fuel debate on the role and content of osteopathic principles as well as guide future curriculum content. It was the writer's assumption that increased understanding of the role, content, and history of osteopathic principles would encourage their application or review. The primary data collection method was in-depth interviews. Supplementary methods included a demographics data sheet and a literature review. Three theories were developed from the findings and the study’s conceptual framework: (a) traditional osteopathy includes treatment of the fluid body and this distinguishes it as a unique medical practice; (b) the principle, “the role of the artery is absolute,” distinguishes traditional osteopathy as unique from other manual therapies; and (c) recognizing that the fluid body is a unique body of work and incorporating the principle is a multi-layered process. This research revealed that the principle, “the role of the artery is absolute” is not fully understood or embraced due to the wording; however, the concept embodied in the principle is fully integrated in the practice of traditional osteopathy as expressed by the participants. The study further demonstrates a strong tendency towards lifelong learning where mentorship, experience, and post-graduate courses highly influence outcomes. Acknowledging that the College d'Etudes Osteopathiques/Canadian College of Osteopathy is seeking the first university-level course in traditional osteopathy, content and

clarity of osteopathic principles is important. This study suggests there could be a barrier in comprehension due to the wording of the principle. The recommendations put forth are for faculty, undergraduate and postgraduate students, and future research. Due to the multiple factors that affect the position of osteopathy on the landscape of healthcare, recommendations offered should be reviewed for their appropriateness.

Key words: Andrew Taylor Still, osteopathic principle, Canadian osteopath(s), blood flow, fluid flow, Canadian College of Osteopathy, “the role of the artery is absolute”, “the rule of the artery is absolute,” osteopathic technique, traditional osteopathy.

RÉSUMÉ

Les recherches indiquent que la majeure partie des experts canadiens en ostéopathie intègrent à leur pratique le principe ostéopathique selon lequel « le rôle de l'artère est absolu ». Une majorité écrasante d'entre eux s'intéressent aux liquides et aux fluides du corps dans le cadre de leur traitement. La présente étude qualitative concrète a été conçue pour explorer, à l'aide d'un échantillonnage au jugé composé de dix praticiens experts en ostéopathie du Canada, les perceptions de ces derniers sur le principe ostéopathique « le rôle de l'artère est absolu ». La chercheuse a eu l'idée de cette étude parce qu'elle était curieuse de découvrir l'application unique de cet enseignement du fondateur de l'ostéopathie, Andrew Taylor Still. L'étude vise à alimenter le débat sur le rôle et le contenu des principes ostéopathiques et à guider l'élaboration du contenu d'un futur curriculum. La chercheuse estime qu'en accroissant la compréhension du rôle, du contenu et de l'histoire des principes ostéopathiques, il sera possible de favoriser leur application et leur étude. La première méthode de collecte de données était la réalisation d'entrevues approfondies. D'autres méthodes connexes ont été utilisées, notamment des feuilles de données démographiques et une revue de la littérature historique et actuelle sur le sujet. Les données ont été codées et les catégories ont été principalement construites à partir des données, mais elles sont également de type émergent. Trois théories ont été élaborées à partir des conclusions et du cadre conceptuel de l'étude : (a) l'ostéopathie traditionnelle comprend le traitement du corps fluide et cela la distingue et en fait une pratique médicale unique, (b) le principe « le rôle de l'artère est absolu » distingue l'ostéopathie traditionnelle et la rend unique comparativement aux autres formes de thérapies manuelles, et (c) reconnaître que le corps fluide est un aspect unique et que le mise en application du principe est un processus en plusieurs étapes. La présente recherche a révélé

que le principe « le rôle de l'artère est absolu » n'est pas entièrement compris ou accepté à cause de sa formulation, mais le concept qu'il représente est entièrement intégré dans la pratique de l'ostéopathie traditionnelle, comme l'ont indiqué les participants. L'étude démontre également une forte tendance envers un apprentissage permanent dans le cadre duquel le mentorat, l'expérience et les cours de cycle supérieur influencent grandement les résultats. Il importe de souligner que le Collège d'études ostéopathiques tente de faire approuver le premier cours de niveau universitaire sur l'ostéopathie traditionnelle, le contenu et la clarté des principes ostéopathiques. L'étude conclut qu'il existe peut-être une barrière à la compréhension à cause de la formulation du principe. Les recommandations de l'étude sont destinées aux facultés, aux étudiants de premier cycle et de cycle supérieur, et aux chercheurs du futur. Étant donné les facteurs multiples qui influencent la position de l'ostéopathie dans le paysage des soins de santé, ces recommandations devraient être examinées pour garantir leur pertinence.

Mots-clés : Andrew Taylor Still, principe ostéopathique, ostéopathe (s) canadiens, flux sanguin, circulation des fluides, Collège d'études ostéopathiques, « le rôle de l'artère est absolu », « la règle de l'artère est absolue » technique ostéopathique, ostéopathie traditionnelle.

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LIST OF ACRONYMS AND ABBREVIATIONS

CCO/CEO	Canadian College of Osteopathy/College d'Etudes Osteopathiques
BSO	British School of Osteopathy
ECOP	Educational Council for Osteopathic Principles
JAOA	The Journal of the American Osteopathic Association
IJOM	International Journal of Osteopathic Medicine
LPT	Lymphatic Pumping Techniques
OIA	Osteopathic International Alliance
PRM	Primary respiratory mechanism
UK	United Kingdom

PROBLEM STATEMENT

1.1. Introduction

This study seeks to explore and document how Canadian osteopaths incorporate the second CEO principle, "the role of the artery is absolute," in their practice. The 10 participants who were interviewed in this study are all graduates of the CEO with extensive work experience in the field of osteopathy, members of the faculty at the CEO, or have published work in the field. The principle, "the role of the artery is absolute" is one of four guiding principles taught at the CEO. Currently, there is no documented research detailing how or if Canadian osteopaths are incorporating this principle in their diagnostics or treatment. The theories developed in this study could be useful in future curriculum development at the CEO in terms of preserving the distinctive and unique practice of osteopathy.

1.2. Problem Statement

The principles of osteopathy have changed and developed over time based on a desire to preserve the original osteopathy while staying current and distinct in today's landscape of medical research and the fields of manual therapy. Andrew Taylor (A.T.) Still, the founding father of osteopathy, did not leave behind a set of principles but rather a life's work of teachings, case studies, and writings that documented his philosophy of osteopathy. The principle, "the role of the artery is absolute" is grounded in the writings and teachings of A.T. Still, yet the interpretation of this principle encompasses more than just Still's original intent; it reflects years of research and study by many osteopaths who have developed palpation and treatment of all of the fluids and fields of the body.

The debate regarding the content of the guiding principles is ongoing internationally. The work done by Still and his students and colleagues is sometimes examined and determined to be archaic in the context of current medical practice. However, it is also considered ahead of its time in terms of its treatment of the body as a complete and functional unit and its recognition of the important role that structure plays in the health of function and physiology. There are many developing concepts in best medical practice that teach practitioners to see the unique person as opposed to a set of symptoms in isolation.

Still founded a discipline of health care that is grounded in regarding the body as a functional unit whose parts must all move correctly and on time. His system of manual therapy focused on aligning tissues of the body to allow free and unobstructed fluid flow. Osteopathy as founded by Still was preventative in nature; the goals of treatment were never symptomatic relief but rather finding the root cause of the disturbance manifesting itself as disease. Still left us questions which challenge us today: questions surrounding vitality, questions surrounding higher powers and powers of nature, and questions regarding our true nature and the importance of helping patients come into being with theirs. The debate over fluid flow and Still's intention will be covered in greater detail in Chapter 2.

Osteopathy is not practiced in the same manner around the world. In the United States, not all osteopaths use OMT techniques. Some colleges maintain the importance of Still’s basic concepts because they keep the practice unique and distinct from other manual therapies. Other colleges insist that osteopathy must remain relevant and in line with current evidence-based medical practice and suggest that archaic concepts that were

relevant in the late 1800's are no longer, or at least do not in fact contribute to defining osteopathy as a unique discipline. The importance of free, unobstructed blood flow is not a unique concept in the landscape of healthcare.

Published work by Canadian osteopaths related to fluid flow is a rare find but within the scope of the manual practice of osteopathy there is some research being conducted, such as work in relation to the vascular tree.

1.3. Statement of Purpose

The purpose of this study is threefold. First, to explore a sample of Canadian osteopath's perceptions of the principle, "the role of the artery is absolute," including their understanding of its history as well as their understanding of the principle as it was meant to be interpreted. Second, to document if or how this principle emerges in their practice. Third, to develop theories, based on the data, to shed light on the role this principle plays or does not play in the broader scheme of osteopathic studies and practice.

1.4. Research Questions

The research questions in this study were designed in an attempt to produce data that would further the debate and examination of osteopathic principles, namely, "the role of the artery is absolute". Research questions are as follows:

A. What are osteopaths' understanding of the history behind the CEO principle, "the role of the artery is absolute"?
B. What are osteopaths' understanding of the breadth of meaning and interpretation of the wording in the principle "the role of the artery is absolute"?
C. If osteopaths incorporate the principle in their practice, and if so, how?

D. What are osteopaths' feelings and attitudes towards this as a guiding principle?

E. If or how can this principle be considered in current and future curriculum development to help keep the practice of osteopathy unique, distinct, and current?

1.5. Overview of Methodology

Following the approval of the CEO's thesis proposal jury, I studied the perceptions of 10 Canadian osteopaths regarding their use of the principle, "the role of the artery is absolute" using a grounded theory qualitative research approach. The methodology is described in more detail in chapter 3. In-depth semi-structured interviews were conducted to obtain the primary method of data collection, whose results are presented in chapter 4. Although a preliminary literature review was conducted before the interview process for purposes of the proposal, the literature review (chapter 2) reflected the data collected in the interview process and continued throughout the study. The theories that were developed based on the data are presented in chapter 5.

1.6. Rationale and Significance

The rationale for this study originated in the researcher's desire to share the history of the principle, "the role of the artery is absolute," as well as her commitment to preserve the unique and distinct practice of osteopathy through the investigation of the work of Canadian osteopaths. Better understanding of the history and significance of the principles of osteopathy are needed in the effort to achieve validation of the practice of osteopathy in the medical field. Validation of osteopathy as a credible and valuable

manual therapeutic practice will benefit a growing population of people needing effective health care.

1.7. The Researcher

At the beginning of this study, the researcher was a recent graduate of the five-year part-time osteopathy program at the Halifax campus of the CEO. The research and interview questions were devised without knowledge of post-graduate courses and experience. Further, during the course of the five-year study program the researcher did not engage in a thorough reading of historical osteopathic texts. Therefore, initially I did not have a comprehensive grasp of the subject matter. This may have influenced the type of questions devised in the initial scope of the interviews and may have biased the researcher to early preconceptions of the breadth of the principle, "the role of the artery is absolute." I made continued efforts through journaling and note-taking to critically self-reflect regarding any preconceived notions related to the topic and the methods used. I had many discussions with peers and the thesis and methods advisor to ensure a non-biased outcome and to strengthen the credibility of the research. Methods such as triangulation of data were used throughout.

1.8. Researcher Assumptions

The participants in the study were chosen based on their expertise in the field of osteopathy. It was assumed that participants who met certain criteria such as publishing osteopathic work in accredited journals, presenting work at osteopathic conferences, being a past or present faculty member of the CEO, or having many years of experience working as an osteopath would result in data that was grounded in expertise and therefore valuable to the students and osteopaths in the field at large. Second, it was assumed that

these professionals would be self-reflective and would be engaged in a level of self-study that would enrich the data collection. Third, it was hoped that through an open-ended semi-structured interview design, the participants would provide more than the limited scope of knowledge of the researcher. My intent was to elicit answers beyond the scope of the question to thoroughly obtain as much data as possible pertaining to the perceptions and integration of the principle, "the role of the artery is absolute."

2. CURRENT STATE OF KNOWLEDGE AND RESEARCH JUSTIFICATION

2.1. Introduction

In order to carry out this study, the researcher conducted a literature review covering four key areas. The first section of this chapter reviews the pertinent literature on anatomy and physiology in order to provide a physiological backdrop for the rest of the review. The second portion covers the historical literature relating to blood and fluid flow, because it is on this history that this principle was based. This portion of the review begins with an examination of the work of Andrew Taylor Still, the founder of osteopathy, and continues with coverage of key works by his contemporaries, collaborators, and students. Current literature was also reviewed in the third section of this chapter, as the principle is intended to cover more than its historical roots imply. The wording of the principle implies a guiding concept that signifies that correct and unobstructed arterial blow flow is a key tool and indicator that health is present. When arterial flow is obstructed, disease will result. The intended meaning includes this concept as well as all flows and fluctuations of all the fluids. Therefore, the current literature review included the most recent osteopathic discoveries in the fluid realm. Finally, a fourth area of literature was also reviewed: the discourse surrounding the guiding principles of osteopathy. This was important as the data showed that perspectives, feelings, and attitudes play a key role in how osteopaths use a given principle. These four areas of research provides the context, history, and structure under which osteopaths use the principle, “the role of the artery is absolute.”

To conduct this review, literature was selected from several information sources, including books, textbooks, journal articles, letters, and course material. The historical literature review choices arose from the data in large part, but were not limited to it. The research advisor was also a source for pertinent literature. The researcher made attempts to acquire full texts from primary sources; the Museum of Osteopathic Medicine was a valuable source of unpublished or out-of-print material. Steve Paulus's Osteopathic Resource Center was also consulted. The current literature review was accessed through PubMed, ResearchGate, IJOM, JAOA, and Google using the following search words and phrases: osteopathy principles, osteopathic principles, osteopathy blood, osteopathy artery, osteopathy lymphatic, osteopathy cerebrospinal fluid, osteopathy embryology, the role of the artery is absolute, and the rule of the artery. The physiology review section was accomplished using books and texts commonly used as suggested course books at the CEO, as well as books suggested by osteopaths with expertise in physiology. Course notes from the researcher's undergraduate studies at the CEO were also consulted. No delimiting time frame was used around which the search was conducted; in fact, the search was ongoing throughout the course of the study.

Although the researcher made attempts to close gaps in the literature, literature to support the complete historical evolution of the principle, "the role of the artery is absolute" was not fully documented. These gaps are detailed in the literature review.

Throughout the literature review, a conceptual framework developed allowing the researcher to visualize a map of the field of inquiry. This dynamic framework arose simultaneously from the data from the interviews and the literature review (see Appendix 9).

2.2. Anatomophysiology Summary of Fluid Flow

Good blood flow helps maintain homeostasis in the body. Arteries transport oxygen-rich blood containing nutrients and hormones (Tortora & Derrickson & Derrickson, 2009, p. 689, 760). Venous blood removes carbon dioxide and wastes from metabolic cellular processes. Blood helps to regulate both pH and body temperature (Tortora & Derrickson, 2009, p. 690). Lymphatic, nervous, and cerebrospinal fluid flow all contribute to the global system of circulation that rewards the tissues with nourishment, immunity, repair, drainage, and vitality.

Osteopaths have exhibited concern over pathological states where blood flow is not functioning adequately.

> Dr. Louisa Burns described the macroscopic and microscopic pathology of the osteopathic lesion at various stages in its history. Oedema, congestion, and petechial hemorrhages which give place in the chronic state to fibrosis, ischemia, and muscular atrophy are typical of the various stages of lesion pathology. (Frymann, 1998, p. 59)

This brief summary will include blood, lymph, interstitial fluid, cerebrospinal fluid, and glymphatics.

2.2.1. Circulation

Arteries have strong contractile walls, allowing blood to flow under high pressure to satisfy tissue needs. Arterial blood contains red blood cells which transport oxygen to cells in the body (Tortora & Derrickson, 2009, p. 698). Oxygen is needed for the aerobic phase of cellular respiration in order to generate adenosine triphosphate or ATP. ATP is the "energy currency of living systems" and contributes to "muscular contractions, movement of chromosomes during cell division, movement of structures within cells,

transport of substances across cell membranes, and synthesis of larger molecules from smaller ones" (Tortora & Derrickson, 2009, p. 56).

Although white blood cells may not spend all of their time in blood, it is the blood that transports them to where they need to go in cases of infection, inflammation, parasites, allergic reactions, autoimmune diseases, cancers, hypothyroidism, and other chronic diseases (Tortora & Derrickson, 2009, p. 701). Platelets, transported by blood, contribute to blood clotting by forming a platelet plug (Tortora & Derrickson, 2009, p. 702).

Veins do not have the same structure as arteries. The inner two layers are much thinner and the tunica media has less smooth muscle and elastic fibres. Many veins contain valves that prevent the backflow of blood but are not designed to withstand high pressure (Tortora & Derrickson, 2009, p. 767). Due to the distinct difference in vein structure, they are much more dependent on good pressure and the healthy skeletal muscle that typically surrounds them (Tortora & Derrickson, 2009, p. 774). The pumping effect of the blood movement towards the heart is contingent on surrounding muscle contraction. Therefore, the venous pressure will also change depending on muscle contraction and exercise. The venous pressure in the legs in a walking adult is around 25 mm Hg and will rise to 90 mm Hg in about 30 seconds when standing still. The pressure in the capillaries also increases, which results in more fluid leaking into tissue spaces, causing the legs to swell (Guyton & Hall, 1996, p. 178).

Blood flow is mostly determined by tissue needs. The heart does adjust to tissue demands, but it is the microvessels of each tissue that constantly monitor levels of

oxygen and nutrients and the removal of carbon dioxide and wastes. It is the highly muscular arterioles that respond to local tissue needs and make adjustments in vessel diameter accordingly. This is how each tissue gets exactly what it needs at exactly the time it needs, no more and no less (Guyton & Hall, 1996, p. 162-163, 183, 199).

Mechanisms which determine blood flow rates are thus divided into two categories. The first is acute control and the second is long term control; acute control refers to fast changes, taking seconds or minutes, that address immediate tissue metabolic needs. Contraction or dilation of arterioles and control over blood plasma pressure in the capillaries are examples of acute control (Guyton & Hall, 1996, p. 201-202). The acute control mechanisms only regulate about 75 per cent of needed blood flow; long-term mechanisms have a more complete regulation (Guyton & Hall, 1996, p. 204). Interestingly, metabolic needs were categorized in acute regulation, but

> if a tissue becomes chronically overactive and therefore requires chronically increased quantities of nutrients, the blood supply usually increases within a few weeks almost to match the needs of the tissue – that is, unless the circulatory system has become pathological or too old to respond." (Guyton & Hall, 1996, p. 204).

Long-term mechanisms refer to changes in tissue vascularity, meaning the degree of vascularity will change depending on the need of the tissues in the long-term, such as over many weeks. Angiogenesis, or growth of new blood vessels, results from "(1) ischemic tissues, (2) tissues that are growing rapidly, (3) tissues that have excessively high metabolic rates" (Guyton & Hall, 1996, p. 205). Guyton and Hall also state that new blood vessel growth will also occur in cases of a blockage; this is termed collateral circulation (1996, p. 205).

Blood flow is further regulated by hormones: norepinephrine, epinephrine, angiotensin, and vasopressin are vasoconstrictors, while bradykinin, serotonin, histamine, and some prostaglandins act as vasodilators. Ions such as calcium, potassium, magnesium, and sodium also play a role in dilation and constriction (Guyton & Hall, 1996, p. 205-207). The kidneys also help regulate blood pressure through the Renin-angiotensin-aldosterone (RAA) system (Tortora & Derrickson, 2009, p. 778).

2.2.2. Pressure and blood flow

Blood flow is a measurement of the volume of blood that moves through the body from regions of higher pressure to regions of lower pressure. The heart pumps the blood and the flow rate depends on the pressure difference within the tissue and the resistance through blood vessels (Guyton & Hall, 1996, p. 163; Tortora & Derrickson, 2009, p. 772).

The venous system holds about 64% of the blood in the system in circulation and therefore may be used as a blood reservoir. The veins have a larger diameter than the arteries and so blood flow is slower and pressure is lower in veins than in arteries (Guyton & Hall, 1996, p. 162, 179).

Capillary beds are the smallest blood vessels, where arterioles and venules meet, and are the site of the slowest blood flow, where the exchange of substances occurs between the blood and interstitial fluid. These substances include oxygen, carbon dioxide, glucose, amino acids, and hormones (Guyton & Hall 1996, p. 161; Tortora & Derrickson, 2009, p. 764-765, 769, 774). For good filtration to occur, the blood hydrostatic pressure (BHP) and interstitial fluid osmotic pressure need to be balanced

(Tortora & Derrickson, 2009, p. 770). If the pressure in the capillary is greater, the fluid will move into the interstitial space. When excess filtered fluid is not reabsorbed, a healthy lymph system will bring it back to the jugular and subclavian vein (Tortora & Derrickson, 2009, p. 770-771).

Blood pressure is most often measured in millimeters of mercury. Blood pressure is "the force exerted by the blood against any unit area of the vessel wall. " (Guyton & Hall, 1996, p. 166). Blood flow velocity is highly related to the pressure difference of the vessel and any slight change to the diameter of a vessel can greatly increase the flow rate or conductance of blood. Conductance is "a measure of the blood flow through a vessel for a given pressure difference" (Guyton & Hall, 1996, p. 167). Very small changes in diameter will significantly increase the flow rate, which allows arterioles to respond to nervous or tissue signals very efficiently.

2.2.3. The nervous regulation of circulation

Circulation is controlled via the autonomic nervous system. The sympathetic nervous system portion of the autonomic system innervates the vasculature of the internal viscera, heart, and peripheral areas (Guyton & Hall, 1996, p. 209). The sympathetic nervous system is responsible for contraction of the smooth muscle in the tunica media of the blood vessel, resulting in vasoconstriction and decreased blood flow. With decreased sympathetic stimulation or "in the presence of certain chemicals (such as nitric oxide, H+, and lactic acid) smooth muscle relaxes" (Tortora & Derrickson, 2009, p. 763) and blood flow increases. The nervous system does not regulate local tissue blood flow; instead, it regulates global blood flow and has a significant impact on the pumping of the heart. The parasympathetic nervous system has much less of an impact on circulation

generally; its only means of control is exercised via the vagus nerve and its innervation of the heart (Guyton and Hall, 1996, p. 209-210).

The vasomotor center is located bilaterally in the medulla and lower third of the pons. It has a vasoconstrictor area, a vasodilator area, and a sensory area. Higher centers, such as the hypothalamus and cerebral cortex also have control over the vasomotor center. The vasomotor center has control over vasoconstriction and dilation through the autonomic system and hormone release (Guyton & Hall, 1996, p. 211-212; Tortora & Derrickson, 2009, p. 776-778)

The nervous regulation of the circulatory system allows for major circulatory changes to happen rapidly. For example, in instances such as exercise or high stress, the nervous system can respond by increasing arterial pressure to supply increased blood flow demands from muscle tissue. Local vasodilation occurs at the tissue level to meet the metabolic demands, and the nervous system balances this with increased tone of the arterial walls to increase pressure and result in increased flow (Guyton & Hall, 1996, p. 211-213).

Reflex centers in the walls of arteries, particularly the internal carotid arteries, also exist to monitor arterial pressure. Signals from these centers are transmitted to the medullary area of the brain (Guyton & Hall, 1996, p. 213)

Tortora & Derrickson (2009) states that autoregulation is "The ability of a tissue to automatically adjust its blood flow to match its metabolic demands" (p. 779). Health is directly related to how quickly the body adapts its blood flow to changes in its environment, making autoregulation an important component of health. Autoregulation

has long since appeared as a key osteopathic principle and will be discussed further in the review on osteopathic principles in section 2.4.

2.2.4. Lymphatics and fluid exchange

The capillaries are the site of the greatest exchange of substances. Blood flows intermittently through the capillaries due to the contraction of the metarterioles and the precapillary sphincters, which is largely in response to shifting oxygen concentrations; this phenomenon is known as vasomotion (Guyton & Hall, 1996, p. 184-185, 201).

The exchange of substances from the plasma to the interstitial space is mostly driven by diffusion. Lipid-soluble substances such as oxygen and carbon dioxide can easily and quickly diffuse through the cell walls of the capillary endothelium. Pores in the capillary membrane allow for water-soluble substances such as sodium ions, chloride ions, and glucose. Some capillaries will allow for greater exchange at a faster rate, such as the liver and kidneys. The rates of diffusion are proportional to the concentration gradient. If there is more oxygen in the capillary, oxygen will move into the tissue space where there is less; the opposite is the case for carbon dioxide (Guyton & Hall, 1996, p. 186). Due to the fact that substances mostly move by diffusion and that the arterioles mainly respond to tissue needs, it is unlikely that external stimulation will affect blood flow directly.

The interstitium is the space between cells and this space constitutes about one sixth of the body. The interstitial fluid of the interstitium is a gel-like substance that contains roughly the same content as plasma but with lower concentrations of proteins, as these do not easily pass through capillary walls. The main structure of the interstitium is

formed by collagen fibre bundles and proteoglycan filaments. Due to this structure, molecules do not typically flow but move by diffusion through the tissue gel. However, small tissue rivulets do exist, which allow for some free fluid flow. These pockets can expand significantly when oedema is present, which allows a freer fluid flow (Guyton & Hall, 1996, p. 186)

Pressure differences between the capillaries and interstitial fluid result in fluid movement between the pores of the capillary membrane. For example, if the pressure in the capillaries is greater than the interstitium, fluid will tend to flow outward from the capillary and vice versa. In contrast, more fluid will move into the capillary if there are greater numbers of plasma proteins there because of the process of osmosis: this is termed colloid osmotic pressure (Guyton & Hall, 1996, p. 187, 190). Although the pores do not allow the free movement of proteins, some pores are large enough to permit their passage. The average protein concentration in the interstitial fluid is usually 40% of that in the plasma (1996, p. 191). Therefore there is also a degree of interstitial fluid colloid osmotic pressure.

Fluid flow between the capillaries and the interstitial space therefore occurs as the result of different pressure gradients. Further, because the capillaries are where the small arteries meet the small veins, the pressures and therefore fluid flow rate will vary depending on whether the transport is occurring at the arterial end or the venous end. This will also vary widely depending on the type of tissue. When fluid flow into the interstitium becomes too great for the pressure balancing mechanisms to address, the lymphatic system will carry away some of the excess fluid. The lymphatic system often can not carry away the necessary amount, resulting in oedema (Guyton & Hall, 1996, p.

187). Typically the lymphatic system only transports one tenth of the fluid from the interstitium; the venous capillaries reabsorb the bulk of the fluid (Guyton & Hall, 1996, p. 193).

The lymphatic system not only transports excess fluid from the interstitium but, importantly, transports proteins and large particles, as they can enter the lymph channels through the valve system unimpeded. The prelymphatics and lymphatic channels drain excess fluid from most tissues in the body. In addition to general protein transport, the lymphatics also absorb nutrients and fats in the digestive tract. The lymphatics will also absorb bacteria and potentially destroy it through the lymph node system. Lymph from the lower part of the body drains in to the thoracic duct and then into the venous system at the juncture of the left internal jugular vein and subclavian vein. This is also where the lymph from the left side of the head, neck, upper chest, and arm drains. The right side of the head, neck, upper chest, and arm drain into the right lymph duct and also empties into the venous system at the right internal jugular and subclavian vein junction (Guyton & Hall, 1996, p. 193-194).

The factors that lead to increased interstitial fluid will in turn cause increased lymphatic flow. However, once the pressure reaches more than atmospheric pressure (0 mm Hg), the lymphatic flow will not increase further. This is most likely due to too great of a pressure on the valves such that they will no longer easily open. Once the fluid has entered the lymph channels, the segment will swell with fluid. When the fluid pressure is great enough the smooth muscle in the walls of the lymph vessel will contract and pump the fluid into the next segment where the same process is repeated (Guyton & Hall, 1996, p. 195). The pumping of lymphatic fluid is also facilitated by external forces such as

"contraction of surrounding muscles in the body, movement of the parts of the body, arterial pulsations, and compression of the tissues by objects outside the body" (Guyton & Hall, 1996, p. 196). In summary, the interstitial fluid pressure and the intrinsic and extrinsic pumping effects are responsible for lymphatic fluid flow.

In manual therapy, the interstitial space and lymphatics may be targeted to treat fluid flow (Lederman et al., 2005, p. 32). Range of motion, particularly passive, results in increased fluid movement. Here, the concept of fluid movement as a result of motion portrays the necessity of life in motion.

2.2.5. Cranial fluid flow

Cerebral blood flow is highly based on metabolic needs, namely oxygen, carbon dioxide, and hydrogen ion concentrations. When oxygen levels decrease, blood flow increases to carry necessary oxygen to active parts of the brain. When carbon dioxide and hydrogen levels increase, blood flow also increases, carrying these substances away from brain tissue (Guyton & Hall, 1996, p. 783). Strong autoregulation mechanisms control cerebral blood flow. The sympathetic innervation passes upwards from the superior cervical ganglia with the cerebral arteries. In cases of extreme exercise, the sympathetic system will vasoconstrict larger arterial vessels to control the amount of cerebral arterial pressure.

Cerebrospinal fluid is "found in the ventricles of the brain, in the cisterns around the brain, and in the subarachnoid space around both the brain and the spinal cord. All these chambers are connected with one another, and the pressure of the fluid is regulated at a constant level" (Guyton & Hall, 1996, p. 785).

Cerebrospinal fluid is formed from the blood plasma through the filtration and secretion of the ependymal cells of the choroid plexus in the walls of the ventricles. One of the most important functions of the CSF is to create a cushion for the brain. It also provides the correct chemical environment for neuronal signalling and allows for the exchange of nutrients and wastes (Tortora & Derrickson, 2009, p. 500). Most of the CSF is absorbed through the arachnoid villi of the venous sinuses to be emptied into the venous system. Perivascular spaces exist to act as a sort of lymphatic system for the brain and transport proteins and other matter. This system has recently been termed the glymphatic system.

The glymphatics serve the brain in much the same way as the lymphatics serve the body. Elimination of proteins is one of the essential functions of both systems; they also serve for a pathway for immune defense. The structure of glymphatics can be described as a donut-shaped tube that surrounds the blood vessel, creating the perivascular space. The outside of this tube is made of the feet of the neuroglial cells, called astrocytes. CSF flows from the subarachnoid space into these perivascular spaces and is pumped along as a result of the arterial contraction. It is through the astrocytes that the CSF flows into brain tissue. The fluid flowing through the perivascular spaces picks up unwanted and potentially harmful proteins and other waste materials and empties ultimately into the venous system (Nedergaard & Goldman, 2016; Jessen et al., 2015)

Pressure regulation of the cerebrospinal fluid is controlled by the absorption by the arachnoid villi; production of CSF is relatively constant. The method that determines absorption rates is based on a system of one-way valves in the villi and the pressure that

exists in the venous sinuses. When the pressure in the cerebrospinal fluid is greater than the blood in the venous sinuses, the valves open allowing fluid to flow into the sinuses.

2.2.6. Embryology: form and vascularization

Erich Blechschmidt was an anatomist and embryologist who investigated the question of how form arises in the embryo. He theorized that, "the form of the organism differentiates directly under biodynamic forces, not chemical-genetic information" (Blechschmidt, 2004, p.18). He developed concepts such as early growth factors, growth movements, and metabolic fields. In the early embryo, cells change as a result of their position, metabolic needs, and the space they have around them, or their environment. Cells either divide and potentially differentiate or die based on the quantity of nourishment or lack thereof; they then change their shape or structure in response to forces exerted against them. A change in structure results in a change in form which is ultimately determinate of the metabolic field. Developing tissue grows similarly; where the embryo has space to grow and plentiful nourishment, this tissue will grow in complexity into the available space. Tissues which have the opportunity to grow, such as nervous tissue, will then require more nourishment. Vascularization occurs to feed the nervous tissue in the young embryo. Tissues upon which pulling forces are applied will grow long and taut such as tendons, ligaments, and the connective tissue sheath of blood vessels. The function of this metabolic field is to serve as a restraining apparatus. In the growing embryo, the nervous system is fed by the capillaries and blood vessels, which do not reserve much nourishment for themselves, thus resulting in less growth. Blood vessels then act as a restraint to the nervous tissue they feed, which results in folding. The concept of a pushing force on two tissues which are trapped in the metabolic field

will result in the opposite to tissues which have the opportunity to expand and differentiate; tissues which have pushing forces exerted upon them with no room for vascularization between them will result in apoptosis or two cells becoming one. An example of this concept is when the two aorta become one.

Blechschmidt's concept of growth factors has implications for understanding function in the mature organ. He explains that the early growth functions that occur in the forming stage of an organ are the patterns for the later performance of the organ. A component of this concept is that movements within a metabolic field require work as cells typically differentiate against resistance. In this way, he explains that "This work, when expanded over a particular period of time, in turn signifies a particular (biophysical) power, which represents an embryonic performance or achievement" (Blechschmidt, 2004, p. 62).

Vascularization occurs early on in the young embryo. The first vessels are capillaries, which arise from interstices in the mesoderm where fluid moves as a current in the metabolic field. The heart forms early and is already beating by the beginning of the fourth week (2004, p. 46). A large amount of fluid moves towards the growing brain; the heart forms to feed this rapid growth. The first main vessels to form are veins that carry oxygen-rich blood to the heart and then on to the brain. The second of the main vessels to form are the aorta which form from empty space left behind in the mesoderm when the neural groove closes to form the neural tube. The empty space fills with fluid and the aorta that form here carry nutrient-rich fluid to the brain.

2.3. The History of the Principle, "the Role of the Artery is Absolute"

2.3.1. Osteopathy as founded by A. T. Still

The history of the principle, "the role of the artery is absolute" begins with the writing of Andrew Taylor Still. This literature review starts with an examination of his four texts, first published in 1897, 1899, 1902, and 1910. The goal of studying these texts was not merely to source evidence of the concept but to thoroughly study and understand Still's writing. This portion of the review will demonstrate his concept of circulation, fluid drive, health, and approach to treatment, and will seek to place the concepts regarding blood and fluids within the greater whole of his philosophy of osteopathy. The review will then continue with an examination of each fluid and its role in health. One of the key research questions this section aims to answer is whether Still thought there was a hierarchy of fluids or a main fluid driver. Due to the fact that Still did not hand down a guiding set of principles and due to the presence of some archaic terminology and syntax, this researcher has used a number of quotations to ensure that correct interpretation has been exercised and that Still's intent has been portrayed accurately.

In 1899, Andrew Taylor Still wrote *Philosophy of Osteopathy* with the intention of teaching osteopathic principles (preface). One of the concepts that gives insight into osteopathic treatment and methodology is "The rule of the artery and vein is universal in all living beings, and the osteopath must know that, and abide by its rulings or he will not succeed as a healer" (Still, 1899, p. 153). Note that he uses the word rule and not role, as later appears in the CEO principle, "the role of the artery is absolute."

Still insisted that osteopathy is not a practice of techniques and therefore he did not provide recipes for treating specific pathologies. He wrote in 1899, "I do not instruct the student to punch or pull a certain bone, nerve or muscle for a certain disease" (preface). Rather, he hoped to guide the practice of osteopathy using tenets based on anatomy and physiology.

The roles of the arteries and veins must be facilitated to achieve a state of health. "…the arteries supply all demands and the veins carry away all waste material… In these two are the facts and truths of life and health" (Still, 1899, p. 153). Still discusses this principle repeatedly in his writing: "The rule of the artery is absolute, universal, and it must be unobstructed, or disease will result" (1908, p. 180) and "Two things in our system must be perfectly normal. First, the artery and its nerves must deliver constantly, on time and in quantity sufficient; second, the venous system and its nerves must perform their function and allow no accumulations" (1910/1992, p. 127).

The CEO has adopted four guiding principles: "(1) The structure governs function, (2) The role of the artery is absolute, (3) The body is a functional unit, and (4) The (body has an inherent) system of auto-regulation" (Druelle, 2011, p. 5). This qualitative study will examine the principle, "the role of the artery is absolute," its history, and its present-day application. The choice of authors reviewed in the literature review is largely based on the osteopaths who have influenced Philippe Druelle and the data generated from the participants in the study in order to gain a historical and current perspective.

In Druelle's (2011) "Basic Concepts of Osteopathy," which is one of the handouts given to all students on the first day of their first course at the CEO, Druelle explains the meaning of the principle, "the role of the artery is absolute" in the following passage:

> A healthy body requires a normal circulation of blood flow. Any form of obstruction, compression or stasis of the circulation eventually will lead to tissue damage. This concept applies to the flow of all body fluids, including venous drainage, lymphatic, circulation of CSF, as well as nerve conduction. (2011)

He continues with a quote from Viola Frymann, paraphrasing Still: "the artery and its nerves must deliver constantly on time and in quantity sufficient, the venous system and its nerves must perform their function and allow no accumulation. These two demands are absolute" (as cited by Druelle, 2011, p. 6). By choosing as support an extract that is in part from Still, Druelle places the principle, "the role of the artery is absolute" in the context of osteopathic history; this concept was detailed extensively in Still's writing and was further explored by Still's students and colleagues.

Although the explanation of the CEO principle indicates that it is inclusive of all fluid flow, the word "artery" is used. It was chosen even though osteopaths today use the primary respiratory mechanism (PRM) for a diagnostic tool and even though William Garner Sutherland (1998) interpreted Still's writing to mean the "artery is supreme but the CSF is in command" (p. 231). Part of the goal of this literature review is to question why the word artery was chosen over the other fluids. The hypothesis is that Philippe Druelle aims to teach pure osteopathy and so this inquiry and literature review must begin at the beginning with the founder of osteopathy, A.T. Still.

2.3.2. The hierarchy of fluids

It is not easy to distinguish a hierarchy of the fluids discussed in Still's texts. The blood, the cerebrospinal fluid, the lymph, and nerve conduction all sustain health and, when free flowing, ward off disease. Still writes in superlatives, making the reader think that the fluid under discussion at any given time is the most important; however, it is arguable that *each* fluid must flow unobstructed for health to be maintained. Within a stated context, the artery and vein may be deemed paramount, but in another case study the nerve supply is king. Still is passionate about each of the mechanisms and fluids in the body and aims for the reader to be drawn in to his excitement and passion. The reader should not be obsessed with ranking which mechanism is the most to least important but should value every one with the utmost importance within the context that is presented. For example, even after declaring that he knows of no "greater hunting ground than the fascia," (1899, p. 22-23) he maintains that one part is just as great and useful as any other in its place.

There is, however, a sense of chronology in some passages from Still. The arteries are first in this chronology. The following two passages demonstrate this:

> Thus the arteries supply all demands, and the veins carry away all waste material, with returning blood of veins. We find building and healthy renovation are united in a perpetual effort to construct and sustain purity. In these two are the facts and truths of life and health. If we go to any other part or organ of the body, we find just the same law of supply, arteries first, then renovation, beginning with the veins. The rule of the artery and vein is universal in all living beings, and the osteopath must know that, and abide by its rulings, or he will not succeed as a healer. (1899, p. 153)

> Conditions in certain diseases, caused by colds …all depend on upon the same blood and nerve supply, or a general law of blood beginning with arteries to

> and from veins, lymphatics, glands and ducts to supply and take away all fluids that are of no farther use to the vital and material support. (1899, p. 60)

In these two examples we not only witness the chronology of the artery first but we also see the tidal themes of movement, of giving and taking, and of building and removing.

Examining each fluid individually, Still emphasizes each as having the utmost importance in the landscape of health. The craniosacral fluid is the "highest known element that is contained in the human body" (Still, 1899, p. 39) and it must "be delivered in full supply continually to keep health normal" (Still, 1899, p. 76). Lymph fluid is described as having "life sustaining powers" (Still, 1899, p.104); "we strike at the source of life and death when we go to the lymphatics" (1899, p. 108; 1902, p. 68). Still (1899) questions his own use of superlatives: "We lay much stress on the uses of blood and the powers of nerves, but have we any evidence that they are of more vital importance than nerves?" (p. 110). Of nerves, Still (1899) questions "Do you not know that each nerve fibre to its place is king and lord to all?" (p. 76). Of blood, Still (1899) teaches that the blood must flow freely and on time: "A full and complete supply of arterial blood must be generated and delivered to all parts, organs and glands, by the channels called the arteries. And when it has done its work, then without delay the veins must return all to heart and lungs for renewal" (p. 28). "Captain Vein" (Still, 1899, p. 81) works just as hard as the artery. The artery brings nutrition and health; venous flow rids the body of disease; blood flow purifies the body (Still, 1899, p. 153).

When interpreting Still's concept of health, it is difficult to rank one fluid as more important than another. Not only is every fluid of vital importance but Still (1902) explains the relationships between the fluids as ultimately working together in the circulatory system; one fluid does not work alone as the ultimate key to health (p. 67). The relationship between the nerve and the artery is often discussed. The following will give several examples of this discussion. The blood nourishes the nerves and so without a healthy blood supply the nerves cannot perform their function (1899, p. 99-100). Still (1899) also questions, "Is not the labor of the artery complete when it is fed by the hungry nerves?" (p. 158). Further, he says, "the blood supply comes under the motor system of nerves, and delivers at proper places for the convenience of the nerves of nutrition. The sensory nerves limit the supply of arterial blood to the quantity necessary…" (Still, 1899, p. 171). When the osteopath is confronted with a patient suffering with disease, Still (1899) says that "his first and last duty is to look well to a healthy blood and nerve supply" (p. 69). The pathways of nerves and blood must be clear, this is explained in the following quotation:

> If not it (nerves) will fail to execute for want of power – for by it all blood must move. These nerves are found in the plexuses in all parts of the body; they are abundant in the skin, fascia, muscles, lymphatics and all organs great and small. The osteopath must know and learn that no infringement can be tolerated in any part. Nature's demands are absolute… (Still, 1899, p.100)

Still extends his discussion of the relationship of the fluids to include lymph. He advises, "If you do not want to see the rash and sloughing of throat, with a dead patient, I would advise you to train your guns on the blood, nerves, and lymphatics of the fascia and stop the cause at once, or quit" (Still, 1899, p. 191). Then, he encompasses cerebrospinal fluid as well when addressing the head and neck, "…the vital parts which

sustain life, memory and reason, depend directly and wholly on unlimited freedom of the circulatory system of nerves, blood and cerebrospinal fluid" (Still, 1899, p. 44).

2.3.3. Fluid flow and osteopathic concepts

For Still (1902), his method follows the obvious rules of anatomy and physiology and his tone suggests he is both mystified and emboldened by others who cannot see the same logic (p. 9). This tone comes from his observation of nature; he questions how there can be a dispute if you follow the rules of nature. Still's (1899) faith in God's ability to create man with all the necessary tools suggests that the osteopath needs but his hands and mind to heal (p. 130).

He writes that others are fools to pursue symptoms and questions the practice of treating symptomatically (1899, p. 32). He famously said, "To find health should be the object of the doctor. Anyone can find disease." (1899, p. 28) If the osteopath treats the structure, the body will heal itself using its own natural physiology (1899, p. 149). These statements speak to the intertwining of his teachings. Firstly, Still teaches that the cause must be found. Secondly, the osteopath must find the drive of health, which will help heal. Then, the osteopath treats the patient by aligning structure to allow the body to heal via the flow of nutrients in the fluids. The teachings of Still are always presented within a functional whole and therefore the study of individual concepts must not be taken in isolation.

Context is important to note. Still was working at a time when antibiotics were not yet discovered but opiates were widely used. He felt surgeries were unnecessarily exploratory, reckless, and at times done before other means of healing had been tried. He

thought that if surgeons would first consider the physiology of blood supply and drainage, perhaps fewer patients would suffer the results of unnecessary surgeries. For Still (1899), it was ignorance of understanding the laws of physiology:

> It is ignorance and inattention to the arteries to supply and the veins to carry away all deposits before they form tumors in lungs, abdomen or any part of the system. Thus man's ignorance of how and why the blood renovates and why tumors are formed, has allowed the knife to be found in the belts of so many doctors to-day. (p. 153-154)

Still recognized the essential key to health: that preventative concepts be employed so the body can heal itself before disease sets in, diminishing the vitality and overcoming the body by then making surgical interventions mandatory. The fascial body was often cited as a key tissue to treat to promote vitality. For Still (1899), it is "the dwelling place of the Infinite so far as the man is concerned" (p. 163). The fascia has a relation to vitality because it is within the fascial matrix that the fluids flow. The vitality is ultimately the fluid flow. The fluid flow is greater than the body, for where does this power originate but if not from a source greater than man.

Still's methodology of treatment rests in the assurance that all parts are working correctly and on time. All parts "must all be present and answer roll call" (Still, 1899, p. 17). Still teaches that if form is upheld, proper function will be ensured. Proper function is ultimately the normal function of fluid physiology. "The osteopath seeks first physiological perfection of form, by normally adjusting the osseous frame work, so that all the arteries may deliver blood to nourish and construct all parts" (Still, 1899, p. 27). Here, Still argues that the goal of adjusting the form is to allow free fluid flow in the arteries, veins, and nerves (Still, 1899, p. 28; 1902, p. 33). Under this light, the

principles, “structure governs function” and “the rule of the artery is absolute” appear to overlap. If alignment is ensured, disease will not have the conditions to move in. Disease may in fact begin because the conditions are correct for it. Two examples of many illustrate this concept:

> A partial dislocation of one side of the spine would produce a twist which would throw one muscle on to another and another, straining ligaments, producing congestion and inflammation, or some irritation that would lead to a suspension of the fluids necessary to the harmonious vitality of the foot. (1899, p. 32)

> Suppose a fall should for the lumbar vertebra, and push it at some articulation, front, back, or laterally; say the lumbar with one or two short ribs turned down against the lumbar nerves with a prolapsed and loosened diaphragm, pressing heavily on the abdominal aorta, vena cava, and thoracic duct; have you not found cause to stop or derange the circulation of blood in the arteries, veins, lymphatics and all other organs below the diaphragm? Then heart trouble would be the result. Fibroid tumors, painful monthlies, constipation, diabetes, dyspepsia or any trouble of the system that could come from bad blood would be natural results, because lymph is too old to be pure when it enters the lungs for purifying. If blood or chyle is kept too long below the diaphragm, it becomes diseased before it reaches the lungs. (1899, p. 213-214)

The methodology of treatment is not to free osseous lesions to reduce symptoms such as pain, for example. The methodology of treatment is to realign the bony framework, reduce muscle strain, relieve fascial strain, etc. so that the fluids run free, unobstructed, and on time so that disease may not set in. It is to restore the body’s natural healing mechanisms through alignment so that the natural physiological processes can occur (Still, 1902/2012, p. 15). Osteopathy is therefore not a science that focuses on the simple alleviation of symptoms but a science that facilitates overall and complete health. The osteopath or master mechanic must know all parts and workings of the engine and must know where the force comes from and how it is conducted to all parts of

the body so that the mechanisms that generate fluid flow can restore health. This is the meaning of the concept, "Nature will do the rest" (Still, 1899, p. 21; 1902/2012, p. 33). For Still (1899), disease was "anything that makes an unnatural showing in the body by pain, overgrowth of muscle; gland; organ; physical pain; numbness; heat; cold; or anything that we find not necessary to life and comfort" (p. 154). To be able to execute this concept in treatment, the osteopath must have a complete knowledge of anatomy and physiology; to his students, he taught that they must have a "living picture of all or any part of the body in your mind" (Still, 1899, p. 13).

Still (1899) highlights some specific viscera and systems as being particularly key to the overall workings of health as it relates to fluid flow; the lungs are the "fountain head and supply of the nutrient waters of life" (p. 93) because they supply oxygen to the blood and water to the lymph fluids. The heart is the "the wonder of man and the secret of life" (Still, 1899, p. 98) because it drives blood flow. These two organs are responsible for healthy blood and subsequently lymph flow and the osteopath should first look to the spine to ensure a healthy nerve supply to these organs. The osteopath must study this anatomy and physiology because "a healthy system depends almost wholly on a normal heart and lung" (Still, 1899, p. 69). The heart and lung are acknowledged as vital cleaning or purifying systems for the blood, which in turn feeds other organs; "The organs must have good blood all the time and plenty of it. The blood must do its work and return to the heart and lungs and there leave its impurities, then return as pure blood to do its work again and so continue through life" (Still, 1910/1992, p. 15).

The osteopath should also study and treat the head and neck. This includes the brain because that is the source of power. Still (1899) says, "let your search light ever

shine bright on the brain" (p. 215) The brain "furnishes the propelling forces to the nerves" (Still, 1899, p.60) and the arteries feed those nerves. In *The Philosophy and Mechanical Principles of Osteopathy*, Still (1902/2012) reduces all diseases of the head, neck, and scalp to blood nourishment, blood and lymph drainage, and nerve obstruction (p. 77). Treatment of head and neck also facilitate the flowing of cerebral spinal fluid. Ultimately, Still (1899) warns not to waste efforts treating only anatomy for anatomies' sake, but treat the anatomy to find the cause (p. 78). The cerebrospinal fluid flow holds power and vitality. The osteopath should "Turn the waters of life loose at the brain, remove all hindrances and the work will be done, and give us the eternal legacy, LONGEVITY" (Still, 1899, p. 79).

For Still, treatment of the fascial body is essential to freeing fluid pathways and thus restoring and maintaining health. The fascia is held high in the hierarchy of systems to treat. The fascial matrix permeates every vessel, fibre, and muscle and because it is so entwined it has a great universal power of life and death (Still, 1899, p. 162-165). Therefore, the fascia is not to be left untreated. According to Still (1899, 1902/2012), "I know of no part of the body that equals the fascia as a hunting ground…The fascia is the ground in which all causes of death do the destruction of life" (p. 23, p. 60). Importantly, Still does not view the fascia as merely an anatomical element for him to treat - but sees it as having its own power that is much greater than the osteopath. It is "the house of God" and is the "dwelling place of his [man's] spiritual being" (Still, 1899, p. 163). Throughout Still's writing, there is an acknowledgement of a greater power than man, often called God. At one point, Still asks, "Is God an architect?" (1910/1992, p.13). Regardless of the source of this greater power, what is perhaps most important for the

osteopath is the presence of vitality. The vitality is inherent in the health of the systems of the body but vitality has an essence of something greater than the body; of having a power that sustains life and that the concept of life is greater certainly than the anatomical body. The teachings on fascia demonstrate that the body has a matrix of fascia through which all vessels, fibres, and muscles are entwined.

Still continually looked for innate healing mechanisms in the body and searched for ways to trigger those mechanisms for health. Still sought to understand the nature of fever because it appeared to be a great conductor of fluid flushing. He saw fever as "a natural and powerful remedy" (Still, 1899, p. 28). The big enemy of health is the slowing of fluids due to congestion or oedema and Still saw fever is a natural healing process. He wrote, "As heat and motion have much to do as remedies, we may expect fever and pain until nature's furnace produces heat, forms and converts its fluids into gas and other deposits, and passes them through the excretories to space, and allows the body to work normally again" (Still, 1899, p. 72). The return to health from disease is the return of the motion of the fluids.

If we examine more closely the language Still (1899) uses when discussing the role of the artery, there is a sense of the power of life, vitality, and motion in the following: "by skillfully adjusting the engines of life so as to bring forth pure and healthy blood, the greatest known germicide, …and ward off diseases as nature's God has indicated" (p. 15). The artery in this case carries immunity to protect against disease and gives vitality to the system. The blood also carries life-giving oxygen to the body. Still equates a portion of the person's vitality to the degree of oxygen the body can obtain to fight disease. The vessels provide structure for motion: "Of all officers of life, none have

greater duties to perform than the quarter-master of blood supply, who borrows the force with which he runs his deliveries from the brain which give motion to all parts of active life" (Still, 1899, p. 81). A major theme in Still's teaching is that motion or flow leads to health. This concept is addressed in the following passage:

> Blood must not stop its motion nor be allowed to unduly deposit, as the heart's action is perpetually in motion. The work is complete of the heart if it delivers blood into the exploring arteries. Each division must do its part fully as a normal heart does, or can in the greatest measure of health; and normally formed heart is just as much interested in the blood that is running constantly for repairs and additions, as the whole system is on the arteries for supply. Thus you must have perfection in shape first, and from it to all parts as far as an artery reaches. All hindrances must be kept away from the arteries great and small. Health permits of no stopping of blood in either the vein or artery. If an artery cannot unload its contents a strain follows, and as an artery must have room to deposit its supplies it proceeds to build other vessels adjacent to the points of obstruction. (Still, 1899, p. 188)

Osteopathically, the function of the diaphragm is of importance in part due to its influence over the oesophagus, and the blood, nerve, and lymph vessels that run through it. Still notes that the diaphragm is a separator of the upper and lower; a controller of the sort now known as a pressure regulator. Lesions of the diaphragm will affect blood, fluid, and food flow and potentially cause congestion and disease (Still, 1899, p. 125, 137). Treat the diaphragm and the vessels will be free to transport nourishing blood and remove waste through the venous and lymph vessels.

Still's use of absolutes and superlatives suggests that that every anatomical part and every physiological system contributes equally to health. When speaking of the diaphragm, Still writes of its powers over health and disease. He attributes these great powers to the major vessels which flow through it. From the alignment of the anatomy follows the health of physiology. The health of the physiology is largely based on good

compression-free blood and nerve flow and effective lymph flow and function. First, when examining Still's use of superlatives the reader begins to understand that no one organ is the most important; no particular substance such as arterial blood or lymph is the singular element responsible for health. For example, he said "…Thus the necessity of pure and healthy fascia, because all functions are equally responsible for good and bad results" (Still, 1899, p. 130). All components of the body must work correctly and at the correct pace. Another example, the diaphragm is also credited as being the structure by which great control over health and disease is exercised. "This diaphragm says: 'By me you live and by me you die. I hold in my hand the powers of life and death, acquaint now thyself with me and be at ease'" (Still, 1899, p. 136). Still's (1899) repeated use of the word "must" suggests that a particular system or structure must work effectively or particular results will occur (p. 131) Absolutes, cause and effect, laws, and the idea that nothing but perfect working order will do are major themes in Still's writing, as is the concept that disease results from the slightest inefficiencies or smallest of failures. Of the diaphragm, "It must be normal in place, as it is situated that it will admit no abnormality" (Still, 1899, p. 123). Also, "…we see by all reason that no delay in passage of food or blood, can be tolerated at the diaphragm" (Still, 1899, p. 127). Further, "we have only to use reason to know that an unhealthy condition of the diaphragm is bound to be followed by many diseases" (Still, 1899, p. 129). Writing of rib lesions and their affect on the diaphragm, Still (1899) says, "when prolapsed…we suffer from the effects of normal arterial supply, and venous stagnation below diaphragm" (p. 124) and questions, "Would it not be the foundation for destructive congestion, and abnormal growth?" (p. 137)

In Still's 1910 writing, *Osteopathy: Research & Practice*, he emphasizes that by following the tenets of osteopathy the osteopath will treat with knowledge and reason. He encourages the osteopath to use their knowledge of anatomy, physiology, and chemistry to guide their treatment of the cause of the effect. He imparts the wisdom that it is a waste of time to treat symptomatically and that to rush to a surgical solution is unnecessary. Even with

> …diphtheria, scarlet fever, tonsillitis, sore throat, measles, pneumonia, typhoid fever, erysipelas, etc., if he is called in reasonable time. With the knowledge of the function of the arterial blood to build and the venous blood to carry off, he should hold himself to the tenets of osteopathy, and allow no accumulation of fluids to be retained in any gland of the face, neck or other portion of the body. (Still, 1910/1992, p. 7)

This passage speaks to the teaching as a stand-alone entity that is not under the umbrella of structure governs function. The correct fluid flow in the body is one of the main concepts Still passed down to present day osteopaths. Then the osteopath "cures by the correction of all hindering causes of normal flow of blood and other fluids. An osteopath reasons from his knowledge of anatomy. He compares the work of the abnormal body with the work of the normal body" (Still, 1910/1992, p. 7).

Osteopathy: Research & Practice has a different structure than Still's earlier works. This text was written in similar pattern to other medical texts of the time, in which pathologies were listed along with their cures (Still, 1910/1992, p. xiii). In the section "Osteopathic Fundamentals," Still (1910/1992) reiterates the same core tenets of osteopathy that were written about in his previous books but now more in regards to specific pathologies. Still (1910/1992) also explains the lesion patterns; for example,

how “a nail in the foot will produce lockjaw as an effect of that shock” because, “Local shocks affect the whole system, the nerve and blood supply to every part of the body. They disable or confuse secretory and excretory systems and the fluids retained become a deadly poisons” (p. 9). Even though Still (1910/1992) explains in detail how he corrects bony misalignments, the concept of the importance of fluid flow remains steadfastly a key to health (p. 21-23).

Still (1910/1992) also develops his discussions from earlier texts of individual fluids as all being vitally important in their own right to the concept of systems, “Nature moves by system in all her works” (p. 12). Within these systems different fluids have different fluid drivers. Each must do the work necessary to keep fluid flowing to ensure that disease may not find an opportune environment. Whether it be discussion of heart or lungs or digestive system, it is ultimately unobstructed fluid flow that is the goal (Still, 1902/2012, p. 12). In a discussion about “organs as functionaries” Still (1910/1992) says, “The osteopath’s foundation is that all the blood must move all the time in all parts to and from all organs” (p. 15). Clearly, blood is highly valued as a main fluid driver, but Still leaves the door open to question the roles of all fluids.

Still also emphasizes the importance of normal and abnormal within the laws of the universe and nature, with normal being health and abnormal being disease or any disturbance which hinders health (Still, 1910/1992, p. 13). Further, Still (1910/1992) explains in the following passage that normal anatomy will lead to normal physiology:

> adjust the abnormal to the normal. Then you can expect the normal supply of both blood and nerve supply to all organs. Otherwise you will simply display your ability to give useless manipulations and show your ignorance of cause, and do little if any good to your patients. If I have impressed upon you the

> importance of the seed-like property of arterial blood, what I have said on this subject will do you good. If not, my time is lost and your work will be unsatisfactory in results both to your patient and yourself. (p. 18)

Irvin M. Korr, Ph.D., and his wife Janet Meneley Korr, M.A., M.S.S.W., wrote a 1991 article for the American Academy of Osteopathy Journal (AAOJ), based on a symposium at the 1988 Annual Convocation of the American Academy of Osteopathy, that tackled the "conundrum" of the "supremes of A.T. Still." (p. 7, 8). This paper was also later included in *The Collected Papers of Irvin M. Korr – Vol 2* (1997). Korr and the co-panellists at the symposium examined the use of superlatives in Still's writing (p. 146-147). They examined the use of language in regards to nerves, lymphatics, fascias, the diaphragm, and cerebrospinal fluid in particular. The blood was not cited as an example in the paper written for the AAOJ. The conundrum was that Still writes in superlatives and that in his writings each of the above examples were cited to be the most important at the time he was writing. The question of course is what do we conclude when examining his work as a whole; which is the most important? The conclusion drawn by the panellists was

> In our opinion, Dr. Still meant that a given organ, tissue, or other component becomes supreme in importance at the moment that it fails and casts the burden of compensation or deprivation on all the others. At that moment, also, it becomes – or should become – the focus of diagnostic and therapeutic attention. We see this as Still's way of dramatizining the unity of the body, all the parts being dependent on each other and influenced by each other. (Korr et al., 1997, p. 147)

One of the questions this researcher posed is, why is the rule of the artery not included in the guiding principles set by the AOA? This excerpt answers that question. No one fluid

or structure is supreme in the overall osteopathic treatment or concept; as Still said: "Each organ must help to keep up the universal harmony by furnishing its mite of its own kind" and "All organs belong to the brotherhood of labor, and they are commissioned to show perfect work and good health." (as cited in Korr, 1997, p. 147).

In conclusion, Still did write extensively and repeatedly concerning the vital importance of timely arterial flow to nourish, renew, and rebuild tissue. This concept is presented as a law of nature and therefore an absolute. However, it is not presented as a lone concept but a teaching within a much greater context in the landscape of health and osteopathic treatment and philosophy.

2.3.4. Debate, development, and discussion of the principle, "the role of the artery is absolute"

The present-day student of osteopathy is presented with the principle, "the role of the artery is absolute," which begs the following question: what is the role of the artery in an osteopathic context or within the context of health? Still uses the word rule as opposed to role, and this literature review was not able to document exactly when the word rule became role, as used by the CEO. However, another phrase, "the artery is supreme" was used extensively by William Garner Sutherland. This section will document this evolution, beginning with some research and context from some of Still's students and colleagues that helped to develop some of Still's concepts regarding blood and fluid flow.

Still wrote extensively about treating tissue to ensure unobstructed normal blood and fluid flow. A key phrase he used, which laid the groundwork for the principle CEO osteopaths use today is, "The rule of the artery is absolute, universal, and must be

unobstructed or disease will result" (Still, 1908, p. 182) This phrase speaks to the vascular system. The word absolute suggests that it follows the universal law of nature and that the nourishment the artery conducts must arrive on time and in correct quantity. The rule of the artery for normal anatomy and physiology, and therefore health, is that blood must flow unobstructed and on time to nourish, construct and bring vitality; venous blood must flow to remove impurities from the tissues and prevent inflammation, congestion, and disease-friendly environments.

The phrase, "the rule of the artery" can be misunderstood without knowledge of the original intent of the use of the word "rule" by Still and his fellow osteopathic students and colleagues. Louisa Burns, D.O. (1907), clarifies the use of this word in *Basic Principles Volume 1*, explaining that optimal health is related to normal structure. The use of the word normal in this case is defined as "according to rule" (1907, p. 9). Therefore the use of the word rule in the phrase, "the rule of the artery" means the normal structure and therefore function or "mode of activity" (1907, p. 9) of the artery, as it was understood to be at that time. This is expressed in the following quote:

> The word "normal" literally means "according to rule," and the original significance still underlies its later usage. In this connection, the "normal structure" is that which is the rule among living things, and "normal function" is that which is according to the rule of these same living creatures. The rule, in all living things, is the maintenance of the longest, strongest, and most productive life possible to its kind. (1907, p. 9)

Normal structure at the cellular level depends on correct interstitial pressure, at this time termed "lymph" (1907, p. 45) by Burns. Cells require correct pressure in order to carry out their normal rate of metabolism. The cells must be fed and the waste must be

carried away. Arterial blood carries the necessary nutrients and oxygen to the cells and venous blood and lymph return carry away the waste products of metabolism. This can be done under the correct pressure grade upon the individual cells and with the correct or normal flow rate of arterial and venous blood. Pressure again must be normal in its impact on nerve trunks as this impacts tissue function (1907, p. 13).

The understanding of what is implied by "the rule of the artery is absolute" when it was first written and explored is important to our knowledge of the development of understanding of physiology from the early 1900s to the present. The original phrasing, using the word "rule," implies normal blood flow and pressure with normal quality and quantity making its way to its intended target, as required within the vascular system. Further implied is the notion that this flow has a health drive; if it occurs, other functions will follow. Burns (1907) explains this in the section titled "The blood and health":

> The most important requisite for the maintenance of a plentiful supply of good blood is that the blood shall be kept rapidly moving under a normal pressure. This condition is said to be the most important because if it is present the other conditions are most surely to follow. (p. 42)

The normal structure and function of the artery is absolute.

The fluid drive and pressure of the arterial and venous blood was seen to influence the function of the cells and therefore the entire being (Burns 1907, p. 45, 46, 47). In the hierarchy of fluids, arterial blood was the driver. In chapter VI, entitled "The rule of the artery prevails," Burns explains that the function of the cells relies on the pressure that is exerted upon them. This lymph pressure, and the cellular exchanges that depend upon it, is influenced by the quality of blood and waste products, as well as the

speed at which the lymph can carry away those waste products (Burns, 1907, p. 45). Healthy cellular exchange requires normal blood flow. If the blood flow is too slow in times of arterial dilation the processes of diffusion are altered due to incorrect pressure and decreased cellular nourishment will result. Accepting that the arterial blood is the driver, if there is low arterial blood pressure, this will in turn hinder the removal of waste products of cellular metabolism by the venous blood and lymph system, which become slower as a result. The lymph bath will be clogged with waste products and access to new nutrients will be compromised. The exchange of gases, oxygen, and carbon dioxide also is retarded thus decreasing the alkalinity of the blood (Burns, 1907, p. 47-48).

Burns (1907) views "health and disease as abstract terms applied to conditions of metabolism" (p. 103). Metabolism is affected by the cellular environment and changes to it. Health is a result of the body's adaptation to changes in the environment and "disease is the condition of an organism which is not well adapted to its environment" (Burns, 1907, p. 103). Disease need not be looked upon as a group of frightening symptoms. The discovery of the cause is necessary to restore normal metabolism and health. Burns argues that failing to look and find the cause is what results in drug therapy to treat symptoms. She said, "Diagnosis must include, not only the naming of the symptom complex, but also the determination of the exact condition of the patient" (Burns, 1907, p. 147).

Burns's experiments mapping vasomotion reflex patterns were done in search of the cause of abnormal cellular environments that cause changes in metabolism and disease. Symptom pictures do not typically arise from one malaligned vertebra, for example, but from a complex and layered cause. Using indigestion as an example, the

patient may present with a malaligned rib which in turn affects the digestive system via the sympathetic ganglion but the patient may also be "poorly nourished,…or is over fed, or whose habits of life have been abnormal, may be subjected to some bacterial invasion" (Burns, 1907, p. 150). The indigestion may be caused by the bacteria or parasite that is present but the underlying cause of why the bacteria "gained entrance" and "made themselves at home" is of interest to the osteopath (Burns, 1907, p. 150-151).

Normal blood flow and pressure are regulated by the nervous system. The nervous system regulates the vasodilation and vasoconstriction of the blood vessels affecting the cells, tissues, and organs that the blood nourishes and drains. Any abnormal condition such as, compression of the nerve trunks, mal-positions of the vertebrae, compromise of neuron threshold zones, compromise of the structural integrity of the heart or vessel walls, or abnormal impulses from the brain will all cause faulty co-ordination of vaso-motor nerves (Burns, 1907, p. 53). The environment and changes in the environment around the nerve cells affects their performance (Burns, 1907, p. 185). One of the most influential factors is the quality of the blood flowing through them; if the quality of the blood is poor, it will in turn affect the outgoing nerve impulses. Burns (1907) concludes, "If we wish to affect any function, then, we may do so if we can affect the character of the nerve impulses reaching the group of nerve cells controlling that function" (p. 186).

At The Pacific College of Osteopathy in California, under Burns's direction, extensive experiments on animals and humans were carried out to confirm the concept of vasomotion and the relationship between somato-visceral and viscero-somatic lesions. For viscero-somatic relationships, electrodes were placed on organs and the muscle

contraction response was noted and mapped at the corresponding vertebral level. Human experiments followed and using the mapping from the animal experiments, stimulation or inhibition at various vertebral segments were applied and the effect on blood pressure noted. Conclusions of vasodilation were noted in "deep, steady pressure at the sides of the spine" (Burns, 1907, p. 226) and vasoconstriction resulting from increased blood pressure arose from stimulation of the tissues; these conclusions were made from experiments at the fourth and fifth vertebral levels (Burns, 1907, p. 226).

Carl Philip McConnell, D.O., M.D., a student of Andrew Taylor Still, wrote *The Practice of Osteopathy*, which was published in 1899. McConnell (1899) also identifies that the practice of osteopathy differs from the practice of medical science of the time in that osteopathy focuses on "(1) The cause of disease, and (2) the cure of diseases" (p. 12). One of the main focuses of osteopathic colleges was the in-depth teaching of anatomy and physiology. He maintains, "We believe and demonstrate daily that the causes of diseases are many times due to anatomical derangements" (McConnell, 1899, p. 12). Further, "We hold that if every tissue of the body is anatomically correct practically health must ensue" (McConnell, 1899, p. 14). He emphasizes that it is not just displacements of bone but of any tissue or strain on any tissue that will "interfere with the blood, lymph, or nerve force or other fluids so as to cause an unequal or abnormal distribution of these fluids" (1899, p. 14). Further in his introduction he quotes from,

> Dr. J. Martin Littlejohn from the journal of Osteopathy, February, 1899, as regards the summary of causes of disease osteopathically: "Pathological conditions may be briefly summarized under three heads, (1) misplacements of bone, cartilage, ligament, muscle, etc (2) Disturbances in the fluids of the organism including the blood and lymph and other secretions of the body (3) Disorders and derangements of the nervous system, including its centers, ganglia, plexuses, and fibers." (as cited by McConnell, 1899, p. 15)

McConnell again quotes Littlejohn and reiterates the second point above: "scientific manipulations that are designed to rectify the disturbances of the circulation of the body fluids and to restore their normal condition, especially blood conditions and defects in the blood circulation" (1899, p. 16). Burns, Littlejohn, and McConnell all wrote that the goal of osteopathic manipulation was to correct the abnormal to restore normality and therefore free the vessels that conduct fluid flow. McConnell (1899) summarizes this in the following passage:

> Every diseased condition is traced through symptoms, signs, or pathological conditions to its primary cause in connection with a nerve, muscle, blood vessel, bone, etc. As soon as the cause is located assistance is rendered to nature with the view of re-establishing its normal function. By thus harmonizing the forces of nature, adjusting the structural relations, establishing normal functional activity in the nervous, circulatory, digestive, secretory and excretory systems, and in removing obstructions to the free play of nervous force and the free circulation of blood and lymph there is laid down a normal foundation for a healthy condition of mind and body. (p. 22)

McConnell (1899), like Burns, found that many causes of disease originated in the spinal column (p. 27). Derangement of the bones of the spinal column and accompanying rib heads irritate the nervous system and compromise blood flow to respective organs and vice versa (McConnell, 1899, p. 33, 37, 74). One example is malpositioning of the atlas, which

> is especially susceptible to derangements. On account of the intimate relation of the atlas to the superior cervical ganglion of the sympathetic and to the vertebral blood vessels it is certainly very necessary that the atlas should be well taken care of. No other tissue maintains such significant position in relation to the blood and nerve supply to and from the brain. (McConnell, 1899, p. 23)

Dean Tasker, who wrote *Principles of Osteopathy* in 1903, identified that osteopathy might not be empirical by today's definition. Osteopathy is not reproducible in order to make conclusions. It is however, based on observation: the osteopath must be in the present moment, observing what is happening at that time. Still himself was a great observer and was intimately familiar with the anatomy and physiology of the human body. Osteopathy is based on observation but it cannot be reproduced through repetition of treatment sequences to address pathology. Tasker (1903) identified that Still's most significant observation was that the disease process starts the minute an artery is disturbed (p. 19). Tasker acknowledges that Still did write of his observations from case studies but the result was not a teaching that prescribed technique sequences, it was an observation of a common theme in all cases. It is for this reason that valuing case studies in today's research methodology may provide us with profound conclusions when studied as a group.

An examination of *The Practice and Applied Therapeutics of Osteopathy*, by Charles Hazzard (1901), puts the above into practice. Section 2 on pathology provides the reader with a definition of the pathology, a list of case studies and the relationships with anatomy and physiology, identification of the cause of the symptomology, and detailed notes on treatment and methodology. There is no crude reductionist sequence of treatment techniques to apply to a pathology; instead the reader is asked to engage in thoughtful consideration of a landscape of possibilities that exist due to a cause. In a case of pneumonia, rib lesions were found and identified as cause of the disease (Hazzard, 1901, p. 82-83). True, the cause outlined by Hazzard is largely structural, which would likely be refuted by most in the case of a viral pneumonia today, but this way of thinking

need not be thrown by the wayside as it is quite likely that a patient with pneumonia may present with rib lesions due to excessive coughing and subsequent adhesions or scarring in the lung tissue and visceral pleura. Treating the rib lesions would then aid in increased rib expansion and improved lung function.

Hazzard may have resonated with the principle, "structure governs function" as inclusive of "The rule of the artery is absolute, universal, and must be unobstructed or disease will result" (Still, 1907, p. 182) His definition of osteopathy portrays a living picture where any disturbed mechanics result in disease. Instead of naming obstruction of the artery specifically, he identifies that it is the relationship between structure and physiology that brings about change.

This examination of the texts of Still's students and colleagues demonstrates that the concepts of structure governs function and the roles of fluid flow are both intertwined and can stand alone. Some interpretations gravitate more towards structure governs function as an umbrella principle, thus incorporating fluid flow as a component of function. This is particularly evident in Hazzard's writing. The key element that is not as evident is the role of fluid flow as it relates to vitality and potency. According to Still, this was an essential teaching and this is why the principle "the role of the artery is absolute" can stand on its own.

2.3.5. The rule of the artery is absolute but the CSF is in command

A pivotal development in osteopathic research and practice occurred in the early 1900s. William Garner Sutherland, D.O., a student of Still's at the American School of Osteopathy in Kirksville, Missouri, developed the cranial concept. Sutherland made a

great leap forward in osteopathic research and his work was grounded in Still's philosophy of osteopathy. Sutherland devoted his life's work to researching, applying, and developing Still's writings and teachings. For many years he carried out experiments on his own skull to understand the cranial mechanism for health as well as the repercussions of lesions. The mechanism itself is a diagnostic and treatment tool but, well beyond that, holds the key to potency, to light, liquid light, and the breath of life (Sutherland, 1998, p. 216, 296). Magoun said of the cerebrospinal fluid, which drives the cranial-sacral mechanism, that it "receives and is endowed with the breath of life" (1951, p. 15). Sutherland used the cranial concept to "irrigate the withering fields" (Still, 1899, p. 39). This review will include Sutherland's cranial concept and examine how it relates to all fluid flow and vitality. Sutherland claimed he was reading between the lines of Still's work and believed his interpretation of Still's intended teaching to be correct. He famously interpreted Still's writing on fluid circulation and hierarchy as "the artery is supreme, but the CSF is in command" (Sutherland, 1998, p. 231). Indeed, the quotation "the artery is supreme" will appear repeatedly in writing by Tom Dummer and student notes at the British School of Osteopathy. Regardless, present-day osteopaths use the fundamental tools developed by Sutherland in their diagnostics and treatment. Canadian osteopaths use the PRM as a palpatory tool to diagnose vitality and lesion more than they use tools to measure arterial flow. The current CEO principle, "the role of the artery is absolute" encompasses all fluxes and flows and the discoveries made by Sutherland are central to understanding how Canadian osteopaths treat the fluids.

Still restored malalignments and tissue strains to free fluid flow to ensure correct nourishment and drainage of tissues. He questioned the potency of the cerebrospinal

fluid, postulating that it held a higher intelligence, but did not completely detail the means to which that intelligence could be manipulated in order to restore health. Sutherland developed the cranial concept because he found that harnessing the potency of the cerebrospinal fluid further encouraged correct fluid flow and also communication between fluids and pressure systems. Perhaps most importantly, he tapped into the notion of the tidal movement of the fluids. He said,

> The fluctuation of the cerebrospinal fluid may be controlled in its rhythm by thinking-feeling-seeing-knowing fingers to a degree where all the fluids have a rhythmic-balance-interchange. Tests made before and after treatment of the feel of the tissues, blood pressure readings, laboratory observations and so forth provide ample clinical proof of this statement. (Sutherland, 1998, p. 215, 274)

Today we are still grappling with "the squirrel in the hole of the tree," as did Still and Sutherland.

> Many researchers have inquired about the original source of the quote; "the tail of the squirrel in the hole of the tree". Unfortunately, the Museum has searched for the original Dr. Still quote for years without any luck. We have located numerous secondary sources that denote Dr. Still using this phrase and similar quotes which I have listed for you below.
>
> "It was not a period of compromise or substitution, but clean-cut osteopathic work, and a continuous striving, urgently so, to apply the principles comprehensively. No one entertained a thought that the last word had been said. Indeed, the Old Doctor emphasized the point that only the 'tail of the squirrel was in sight.' Everyone was encouraged to Dig On." - "Early Days of Osteopathy" by Carl P. McConnell, DO in The Lengthening Shadow of Dr. Andrew Taylor Still by Arthur Grant Hildreth, DO (1938, p. 374)
>
> "I have only gotten the squirrel's tail out of the hole in the tree, and that it was up to us, his graduates, to 'dig on' and pull the remainder of the squirrel out of the hole." - Quote from unknown graduate in Doctor A. T. Still in the Living by Robert E. Truhlar, DO (A. Mullen, personal communication, March 13, 2017).

Even if we do not fully understand the mechanism, we know that the work done by Still and then Sutherland holds the key to unlocking inner health and vitality. Sutherland developed many techniques to relieve his patients' symptoms but he was always interested in the body as a functional unit; as the tissues of the body being made up of fluid, including fascia and bone, and how to affect the whole body, not just body parts. Ultimately he was searching for the lesion that held the person back from health and he was discovering ways to not only restore a working component of the mechanism but to trigger the potency through transmutation of the intelligence of the CSF to all the fluids of the body and restore the tide. He admits, as do present-day osteopaths, that we do not fully understand the potency generated by the fluctuation of the cerebrospinal fluid. He said,

> Our current knowledge is like that of an electrician who merely knows that the potent current, or M-element, is present and he is learning how to use its force. We, too, merely know that the cerebrospinal fluid is present and contains the 'highest known element' and that we are now learning, through the cranial concept, how to utilize its force in behalf of the ills of mankind. (Sutherland, 1998, p. 273)

The cranial concept developed by Sutherland (1998) includes

> motility of the brain, intracranial membranes, fluctuation of the cerebrospinal fluid and articular mobility of the cranial bones; and also the motility of the spinal cord, intraspinal membranes, again the fluctuation of the cerebrospinal fluid and the articular mobility of the sacrum between the ilia. (p. 297-298)

In Still's writing, the hierarchy of fluids is debatable. Every fluid is spoken of as having powers that govern each other. Sutherland (1998) makes a compelling case that

through the lens of the cranial concept the "artery may be supreme but the cerebrospinal fluid is in command" (p. 231). Reminding the reader that he is making a contribution of thought to the science of osteopathy, he makes the case, by going "between the lines" (1998, p. 187), that Still intended the same:

> "Another period of observation appears to the philosopher…His mind will explore the bone, the ligament, the muscle, the fascia, the channels through which the blood travels from heart to local destiny with lymphatics and their containers…It does obtain blood abundantly to and from the heart, but the results obtained are not satisfactory, and another leaf is opened of why no good results are obtained, and where is the mystery… A thought strikes him that the cerebrospinal fluid is the highest known element in the human body, and unless the brain furnishes this fluid in abundance, a disabled condition of the body will remain." (Still, 1899, p. 39) …He is speaking of the cerebrospinal fluid, not the arterial stream. You will hear me say from time to time that the arterial stream is supreme but the cerebrospinal fluid and its fluctuation is in command. Then Dr. Still goes on to say:
>
> "He who is able to reason will see that this great river of life must be tapped, and the withering fields irrigated at once or the harvest of health will be forever lost." (Still, 1899, p. 39, as cited by Sutherland, 1998, p. 187-188)

Sutherland's theory of transmutation is that something occurs in terms of potency when the cerebrospinal fluid interchanges with other fluids or nerves and the power of the fluctuation throughout the whole body, restoring the Tide. He says,

> Transmutation…it is a change into another nature, substance, form or condition. It is not the same as…it is different from that transformer up there that you find in the electrical wire, the high tension wire, that brings the voltage…A transmutation changes something into another nature or condition. (Sutherland, 1998, p. 291)

Sutherland likened it to light or liquid light. In his 1953 talk at the Kirksville conference he tries to explain the potency that is created as liquid light. He compares it to the light

generated from a meteor, or from lightning, and says that it is based in or generated from fluid.

> The waters were divided when the earth appeared. From the earth Man was created. The waters were divided! The fascia! Even the fascia is water, even the bony tissue is liquid…water…fluid…if you want to go back to historical record. Fluid! A fundamental principle in our cranial concept. Fluctuation of the cerebrospinal fluid. A motion like that of the tide of the ocean. Something that is governed by the same Intelligence that governs the tide of the ocean governs the rotation of the earth, the sun, the moon and all the planets…The fundamental principle in the cranial concept: the Breath of Life, not the breath of air. (Sutherland 1998, p. 290-291)

The mechanism is based in the fluids but the transmutation into potency is what the osteopath ultimately strives for. The intelligence or source of the potency is from the same source that governs other fluids in the natural world and therefore does not originate inside the body.

Importantly, Sutherland distinguishes between the fluctuation of cerebrospinal fluid and the circulatory flow of fluids. It is not only the contents of the cerebrospinal fluid but its fluctuation that contributes to its potency. Webster's medical definition of fluctuation reads: "The motion of a fluid contained in a natural or artificial cavity, observed by palpation or percussion." Therefore, it is the not only the CSF itself that contains potency and put it in command, but also this rhythmic pulse or fluctuation.

Together, the "invisible element" (Sutherland, 1998, p. 291) in the cerebrospinal fluid and the fluctuation are what creates the potency. Sutherland (1899) said, "If you recognized the real element, the breath of life in the fluctuation of the cerebrospinal fluid, I think you would begin to come closer to the success of Dr. Still and his knowledge of the human body" (p. 291).

Just as the fluctuation is important to potency, the stillness is equally so when seeking to find balance. Sutherland writes of the automatic shifting fulcrum and how we must use such little force in finding balance of the fluids. The fulcrum in Sutherland's cranial concept is the "balance point where the three sickles adjoin" (Sutherland, 1998, p. 238). Here the sickles refer to the reciprocal tension membranes of the falx and the tent on each side. Notice that although we know this to be the area of the straight sinus, Sutherland states that the fulcrum is the balance point, and is referring to the balance point of the fluids. It is the "visualization of an automatic-shifting-suspension fulcrum that included the area where the three sickle shapes adjoin. The fulcrum is a still mechanism over which a lever moves and from which it gets its power" (Sutherland, 1998, p. 238).

Harold Ives Magoun, D.O., faithfully articulated the work of Sutherland in his first edition of *Osteopathy In The Cranial Field*, published in 1951. This text is on the reading list for undergraduate students at the CEO. It is by means of this text that many students explore the concept of the PRM. Magoun's work was officially approved by Sutherland. In the foreword of the first edition, Sutherland writes that the cranial concept is founded in the work of A.T. Still. He acknowledges that the founding work of Still was grounded in the concept where "structural malalignment with restricted articular mobility and tense ligamentous tissue disturb the pathway of the nutrient arterial stream of irrigation" (Magoun, 1951, foreword). Sutherland indicates that his work is exploring the likely intent by Still that the cerebrospinal fluid is a kind of "electric battery" (1951, foreword) in the human being. Changes in the fluctuation of cerebrospinal fluid are "common indications of pathological systemic and structural disorders, acute and

chronic" (1951, foreword). In the preface, written in 1950, Magoun writes "Probably the most fundamental approach to pathology is to be found in the fact that cranial osteopathy can be a vital factor in the movement and hence the chemistry of fluids in direct relation to the central nervous system" (p. xii). In chapter one, "The primary respiratory mechanism," Magoun explains that the cerebrospinal fluid has a connection to a higher intelligence and continues to explain the link between the fluctuation of the cerebrospinal fluid and the health of the body by way of the cranial concept. The components of the cranial concept are: "A. The intelligence and fluctuation of the cerebrospinal fluid. B. The meninges or reciprocal tension membranes. C. The central nervous system. D. The articular mobility of the cranial mechanism. E. Articular mobility of the sacrum between the ilia" (Magoun, 1951, p. 16-18). As it relates to the concept of the vital importance of fluid flow, Magoun details in his book how the fluctuation of the craniosacral fluid can be manually encouraged to restore health through the treatment of the cranio-sacral mechanism. He accounts that it is

> Because of this dynamic relationship between the cerebrospinal fluid and the physiological function of every cell in the body, and particularly those of the central nervous system, the cerebrospinal fluid is the initiating and controlling factor in the Primary Respiratory Mechanism. Here, as elsewhere, the cerebrospinal fluid is in command. (1951, p. 16)

The question of how this occurs is suggested by several means, some of which are: the potency of the fluctuations, the innate intelligence of the fluid, the "protective and restorative powers" of the fluid, its relationship to "central nervous system metabolism," the "volume variation" of the fluid within its (semi)closed container and, perhaps most interestingly when considering the link between the PRM and the whole communication

of fluid flow in the body, "Dispersal of the fluid as the excess fluctuates out along the perineural channels during the exhalation phase of action" (Magoun 1951, p.17). Interestingly, Magoun chose this passage from Still to precede chapter one:

> Finer nerves dwell with the lymphatics than even with the eye…The lymphatics consume more of the finer fluids of the brain than the whole viscera combined…The lymphatics are universally connected with the spinal cord and all other nerves…and all drink from the waters of the brain. (as cited in Magoun, 1951, p. 14)

In the third edition Magoun coments further on the difficulty in studying a system which can only be explored in a living being. The discussion of the cerebrospinal fluid in the third edition includes an explanation of the effects of the venous drainage on the cerebrospinal fluid pressure and the effect of cerebrospinal fluid on the nervous system. It is explained as, "the cerebrospinal fluid system is partially vented by the venous system, converging as it does, upon the internal jugular veins for 95% of the drainage" (Magoun, 1966, p. 25). Further, Magoun (1966) details that the "nervous tissue is more sensitive than any other to its ambient environment, any alteration in the composition of the cerebrospinal fluid would be reflected in alteration of nervous function" (p. 25).

William Garner Sutherland was a devoted student of A.T. Still's and attributes his life's work to the osteopathic foundation that Still laid. Still's writing leaves the reader with a comprehensive understanding of the laws of nature and health which may be restored through osteopathic concepts such as "aligning the structure will facilitate correct function," "viewing the body as a functional whole," and "once the alignment work is done the body will do the rest." The teachings regarding fluid flow are very much concepts of health that occur naturally post-successful treatment via the potency of

the person. Sutherland provides, though not exclusively, a teaching tool with which to palpate the expression of the PRM mechanism. He leaves behind the knowledge that treating the patient osteopathically is also tapping into the person and their life force, or "breath of life." The concept of the cranial-sacral mechanism is an osteopathic one.

2.3.6. The Tide and the fulcrum

Rollin E. Becker, D.O., graduated from the American School of Osteopathy in 1933 and met William G. Sutherland in 1944. From 1962 to 1979, Becker was the president of the Sutherland Cranial Teaching Foundation. He explains the nature of the large Tide as a feeling of the whole person expanding and then melting away (2000, p. 51). He also tells us that "we are not limited to the craniosacral mechanism in learning to control the Tide…we are learning to bring the Tide into its balance point or fulcrum area. In doing this, a transmutation process can take place to reduce the lesion mechanics, correct pathology, and regain health for the individual" (Becker, 1997, p. 29). Further, Becker states that the potency is not just in the fluctuation of the Tide but in the stillness of the fulcrum point, much as Sutherland had taught in the compression of the fourth ventricle. The breath of life within the cerebrospinal fluid is the fundamental concept.

Some major themes in Becker's writing are the theory of transmutation, automatic shifting fulcrums in the fluids, and the theory that potency lies not only in the movement and motility of all fluids and tissues of the body but in the stillness "found at the fulcrum point within the Tide" (Becker, 1997, p. 29). Becker also examines the perspective of himself as osteopath in relationship to the patient and how that affects what presents itself for treatment.

In a lecture given by Becker in 1982, he states the four guiding principles to a group of students in their basic course:

> 1) the body is a unit; 2) the body possesses self regulatory mechanisms; 3) structure and function are reciprocally interrelated; 4) rational therapy is based upon the understanding of the body unit's self-regulatory mechanism and the body's interrelationship of structure and function. (1997, p. 3)

He stresses that "we're here to learn how health is delivered from within a living mechanism" (1997, p. 4). The key wording in this quote is Becker's perspective of health as being delivered from within as opposed to something we seek out or find. In 1986, he said, "The science of osteopathy…is expressed as a fluid drive, motile, mobile mechanism within body physiology" (1997, p. 7). Therefore, the science is dynamic and does not lend itself to the study of pathology or the application of rigid recipes for treatment. In Becker's later work, *The Stillness of Life*, he identified that he was primarily interested finding out where the obstacles were that were impeding the flow of resources. He viewed the physiology as whole working systems as opposed to finding lesions and fixing them (2000, p. 43).

Becker based his work on the teachings on Still and Sutherland but his writing suggests that he had a holistic view and receptive palpatory sense and was not limited to the craniosacral mechanism. His writing on osteopathy is concerned with movement in general of all the fluids and tissues of the body and how, in movement and stillness, they generate potency. He identified

> four major patterns of motion and movement: the neuromuskuloskeletal voluntary motion, the secondary costal respiratory mechanisms, the inherent rhythmic involuntary fluctuation of the cerebrospinal fluid and lymphatic

> system, and the large tide-like motion that has a rhythmic cycle of approximately one and a half minutes. (Becker, 1997, p. 58)

He says of the large tide-like motion that he has "no idea as to its source or its basic nature" but that it is a "powerful therapeutic tool" (Becker, 1997, p. 55). In reference to the third movement pattern, Becker elaborates that it is felt throughout the body via the lymphatic system. Some of the patterns that may be palpated are "longitudinal, alternating lateral, and spiral patterns" (Becker, 1997, p. 85). The theory of transmutation explains the connection between the "breath of life" originating in the cerebrospinal fluid and how it transforms its potency to all tissues and fluids of the body:

> Transmutation: the change of one thing into another; the change of one chemical element into another. Transmutability is a natural phenomenon occurring within the body throughout life. The rhythmic fluctuation of the cerebrospinal fluid involves transmutability and creates rhythmic balanced interchange with the choroid plexuses, the physiological centers in the floor of the fourth ventricle, the neurons of the central and peripheral nervous system, the pituitary-hypothalamic axis, pineal gland and other hormonal glands throughout the body, the lymphatic system, and in fact, with all the cellular and fluid systems of the body. (1997, p. 88)

Finally, he acknowledges that Sutherland was guided by his "Maker," from "whom he received the necessary urging to 'dig on' when the road was difficult to follow. This is a reliance on a great wisdom from Divine Mind" (Becker, 1997, p. 26). Becker, like Sutherland and Still before him, saw that the principles that govern osteopathy are grounded in the laws of nature and the ebb and flow of fluids as resulting from normal anatomy but also believes that there is a higher intelligence or force that seems present. In *The Stillness of Life*, Becker (2000) interprets Still's main osteopathic principle as, the body is designed by God or nature and there are no plans or patterns

unless there is need or strain because health is a dynamic autoregulating state (p.4, 67). This interpretation suggests that there can be no study of plans or patterns because they present themselves on a need-to-be basis. Each individual must be assessed and treated as their unique tissue demands because in the disease process everything is involved (Becker, 2000, p.11). He also noted that the breath of life principle is not measureable but is fundamental (Becker, 1997, p. 90). In the current debate on osteopathic principles, the question of measurability is a prevalent theme in terms of the discussion with other healthcare fields, in terms of education, and in terms of keeping pace with today's evidence-based healthcare model.

Becker sees himself as the student and the patient as the physician (Becker, 2000, p.16). With the patient as physician, the patient presents what needs to be treated and in the correct order. Becker (2000) also identifies the difference between testing for motion and feeling for motion, which allows the osteopath to become a participant in a live anatomy which can use the provided fulcrum to do its work (p. 41-42)

Becker's perspective and receptive palpation allowed him to work dynamically with living anatomy and physiology. His respect for the stillness in the potency of the fulcrum and understanding of transmutation allowed him to treat at a level where potency was available to the person. His principles and guiding questions resulted in attaining a level where nature could do the rest.

2.4. Current Literature Review

There is overwhelming evidence from the historical literature that osteopaths consider fluid flow to be vital to successful treatment. Treating fluid flow indirectly by

aligning tissues and releasing the fascia has been an osteopathic concept since the discipline's inception. The researcher aims to focus this portion of the literature review on providing evidence that some osteopaths are treating fluids more directly now than they were previously. The current literature review includes evidence published within the last ten years. In some fields, the last ten years would not be considered current but the field of osteopathy does not shift frequently or quickly.

2.4.1. Current osteopathic manual therapy for the treatment of fluid flow

Paul Chauffour is the author of several books using the mechanical link method of diagnosis and treatment. Mechanical link is a test and technique that was allegedly first taught by Still, who taught it to Arthur Becker, who taught Rolland Miller, who then taught Paul Chauffour (Chauffour, Prat, & Michaud, 2009, p. 17). The "suppleness and elasticity" of the artery or nerve is assessed using a "tension test" (Chauffour et al., 2009, p. 24) and if positive for an osteopathic lesion the structure is treated using a gentle recoil technique (Chauffour et al., 2009, p. 30). This text demonstrates direct tests and techniques for arteries, veins, and nerves in the body.

There is some current osteopathic technique-specific research on blood flow, and generally the techniques employed are a blend of more direct and indirect techniques. In 2012, a randomized trial study was conducted to examine "The effect of osteopathic manual therapy on the vascular supply to the lower extremity in individuals with knee osteoarthritis" (Jardine, Gillis, Rutherford). The literature review for this study brought to light several factors affecting blood flow: local occlusion, imbalanced pressure gradients, and altered tensions in the diaphragm. The study found that "treatment

focused on releasing fascial restrictions and balancing the diaphragms reduced the resistive index in the superficial femoral artery" (Jardine et al., 2012, p. 130).

Jean-Pierre Barral is osteopathically developing the orthopaedic Adsen-Wright test, also known as Soto-Hall, as a tool in diagnostics. Conducted by palpating the radial pulse, a positive Adsen-Wright test reveals decreased blood flow to the hand in the position of external rotation and abduction of the ipsilateral upper limb. Barral has observed two phenomena of note. First, depending on the rotation degree of the upper limb he can conclude that the source of the dysfunction is either mechanical (of the thoracic outlet) or visceral in nature. Second, using the Doppler device to measure blood flow, he has observed good results from visceral manipulation, although the mechanism of results was unclear. He concluded that the findings were due to a "reflex effect" which involved the "parietal peritoneum as intermediary. The peritoneum receives certain sensory fibers arising from the phrenic nerve, which interconnects with the subclavian nerve" (Barral, 2007, p. 14), ultimately resulting in vasoconstriction of the subclavian artery.

In *The Science and Practice of Manual Therapy*, Eyal Lederman (2005) reviews various methods to affect fluid flow. He identifies three conditions that are aided by manual therapy: inflammation, ischaemic tissue, and impediment to flow, and lists several basic means by which these conditions may be addressed: lymphatic drainage, compression and pumping of tissue at the correct depth, stretching of scar tissue, mobilization of the nerve within its sheath, and passive and active mobility. All of these methods have been well documented by physiotherapists, massage therapists, osteopaths, and others in manual therapy fields. Interestingly, Lederman identifies which tissue and

fluid can be affected by manual therapy and which cannot for physiological reasons. He explains that the capillaries and blood flow within them are highly regularised by local feedback loops that monitor pressure and concentration gradients. It is the interstitium and lymph system that can be affected by manual therapy. He says, "Gross fluid flow between the two extracellular compartments can be affected by external mechanical stimulation. Hence, most of the manual work is directed at stimulating fluid flow between the blood and lymph compartments" (Lederman, 2005, p. 32). In his description of compression pumping techniques, he links the technique directly with the physiological response; in manual force compression to facilitate fluid flow, the purpose is to create "...fluctuating pressure gradients within and between the different fluid compartments" (Lederman, 2005, p. 35). The degree of compression, the rate, and the quality of rhythm and repetitive nature are all based on physiological processes at the cellular level. Although Lederman does not present new information in the field of osteopathic manual therapy, he reminds the practitioner that understanding physiological processes at the cellular level is paramount when devising new techniques and proving their effectiveness.

In 2012, IJOM published Lisa M. Hodge's study "Osteopathic pump techniques to enhance immunity and treat pneumonia." Lymphatic pump techniques were used on rats to measure whether these techniques were effective in clearing bacteria from the lungs. Results were considered statistically significant indicating that LPT did clear more bacteria from patients' lungs. The techniques included in the LPT treatment were a blend of indirect techniques to free lymphatic pathways and direct lymphatic pumping techniques.

Recent discoveries in glymphatics have created a potential for further research in manual therapy of the cranium. Hitscherich et al. have suggested that osteopathic manual therapy (OMT) could improve the removal of proteins through the glymphatic system. They outline a methodology of treatment to free glymphatic pathways and propose a study to track the protein in the blood and CSF post OMT in different aged adults (Hitscherich et al., 2015).

2.3. Osteopathic Guiding Principles

As the science of osteopathy grows and develops we witness shifts in the inclusion or exclusion of certain concepts. Colleges guiding principles do not all include concepts detailing the importance of free and unobstructed liquid or fluid flow. Neither do they often include principles relating to palpation and the PRM, which are key concepts that make osteopathy unique and distinct from other manual therapies. Phillipe Druelle was influenced by many historical figures in osteopathy, and the principles used by the CEO are based on the teachings that have been passed down through generations.

2.3.1. Interpretation of the principle "The role of the artery is absolute" at the CEO

Osteopaths educated at the CEO have a training grounded in the principles of osteopathy as originally founded by Still. At the CEO, students learn four core principles: "The structure governs the function; The role of the artery is absolute; The body is a functional unit; (The body has) a system of autoregulation" (Druelle, 2011, p. 5). These principles govern the methodology of treatment. In Philippe Druelle's "Letter as a tribute to Andrew Taylor Still," Druelle honours the concepts that Still founded. He also lists the celebrated osteopaths "Weaver, Sutherland, McLaughin, McConnell, Burns, Downing, Fryette, Magoun, Mitchell, Schooley, Becker, Wales, and Dummer" who have

"developed therapeutic methods, to release the different parts of the body from the constraints that modify vascularisation, innervation, and tissue mobility so that our patients may recover their balance and their health. Osteopathy has advanced on the same foundations" (Druelle, 2009, p. 15).

In other colleges around the world, interpretations of the original principles may vary. In the United States, medical osteopaths do not use "the role of the artery is absolute" in their current set of core principles. The AOA uses as their fourth principle the indication that rational therapy is the interlinking of the other three principles. The CEO allows the teachings of the fluids to stand alone whereas the AOA subsumes work within the fluid fields under the other principles.

Jane Stark has documented the evolution of the American principles and to this day, they are being revised and new principles are being written (Stark, 2013, p. 5).

At this point in time there are significant deviations from how osteopathy has historically been practiced; there is a split between osteopathy as practiced by manual practitioners and medical osteopathy, where the percentage of osteopaths using OMT is quite small. In his "Letter as a tribute to Andrew Taylor Still," Druelle discusses the preservation of osteopathy as a manual practice in Europe versus the shift occurring in the United States, where this manual therapy is decreasing (2009, p. 16). This is also a time in history when standards in osteopathic education are emerging. OSEAN, the Osteopathic European Academic Network, of which the CEO is an affiliate or "extraordinary" member, pursues "excellence in osteopathic education" (n.d.). They seek to "foster collaboration and innovation among member schools" and to "develop a

standardized model of osteopathic education." The process of professionalization requires examination of the guiding principles.

The interpretation and teaching of the principle "The role of the artery is absolute" at the CEO is as follows:

> A healthy body requires a normal circulation of blood flow. Any form of obstruction, compression or stasis of the circulation eventually will lead to tissue damage. This concept applies to the flow of all body fluids, including venous drainage, lymphatic, circulation of CSF, as well as nerve conduction. (Druelle, 2011, p. 6)

Examining the lineage of this principle, we can consider the work of Viola Frymann, D.O., a student of Dr. Sutherland and an influential teacher of Philippe Druelle. Frymann quotes Still, "the artery and its nerves must deliver constantly and on time and in quantity sufficient; the venous system and its nerves must perform their function and allow no accumulation. These two demands are absolute" (as cited by Druelle, 2011, p. 6). Common to these statements is the notion of normal flow. Still wrote of the importance of knowing normal anatomy and physiology and ensuring that no obstacle should remain that may impede this flow. Interestingly, Frymann does not exclude principles based on the importance and potency of fluid flow. She also stresses the basic law of cause and effect; the osteopath must ultimately search for the cause.

In 1976, Frymann wrote an article entitled "The Philosophy of Osteopathy", in which she writes of the basic principles "as they were originally expressed and interpreted as the expanding concepts of today." One of the basic principles she lists is "circulation of healthy blood is fundamental to well-being." She outlines this first by

stating that the heart is the pump of the blood flow and the blood flow is controlled by the sensitive neural system. Efficient arterial blood must be delivered to cells and venous drainage must remove deoxygenated blood in an equally efficient manner. Any disturbance to this system is evidence of pathological states such as inflammation, atrophy or hypertrophy, irritation, and trauma. Osteopathic treatment is four-fold. First, the osteopath should restore structural dysfunction, then consider where the vascular channels traverse, such as the fascial layers, the diaphragms (namely, the thoracic and pelvis diaphragms as they relate to congestion or venous return in the abdomen and lower limbs, and the cranial structures as they relate to impingement on arteries which can be the cause of migraines). Third, the osteopath should ensure rhythmic motility of the articular mechanism to "permit efficient autonomic nerve control of vascular channels, assuring suitable supply and return of blood to and from every cell" and fourth and finally the osteopath should not ignore all "tissues en route that may contribute to their dysfunction" (Frymann, 1976). This approach to treatment identifies that the osteopath should consider the pathways, the pressure mechanisms, and structures that influence fluid flow. This should be in the forefront of the osteopath's mind in treatment.

Frymann (1976) also writes of "The potency of the cerebrospinal fluid." Referring to Sutherland (1998), she quotes, "The rule of the artery is supreme but the cerebrospinal fluid is in command" (as cited by Frymann, 1976). Frymann (1976) writes of the potency of the cerebrospinal fluid, which can be directed to any "membranous articular strain, (or) area of impaired mobility in the articular mechanism." From the resultant restoration of free and rhythmic motion, the potency "may be activated and distributed throughout the body to accomplish remarkable therapeutic changes by the

compression of the fourth ventricle." (Frymann, 1976). Frymann credits Still and Sutherland for the foundation of these teachings.

The "role of the artery is absolute" can manifest in many ways. Included in the CEO meaning is the importance of restoring all fluctuations and flows; this includes the concept of potency of which Frymann speaks.

2.4.2. Historical periods of osteopathic principles

Jane Eliza Stark has extensively documented the history of the principles of osteopathy in the English language. Her article, "An historical perspective on principles of osteopathy," published in 2013 in the International Journal of Osteopathic Medicine, details the development of osteopathic principles through three periods.

> The original period includes osteopathy derived from the contributions of Andrew Taylor Still, DO; John Martin Littlejohn, DO; and their contemporaries, ending in about 1910. The traditional period follows, ending in about 1950. The modern period began in the early 1950's and continued to … 1993. (Stark, 2013, p. 2)

Stark includes reworking of the principles by osteopathic physicians in the United States up to the year 2003 in the modern period. The traditional osteopathy practiced by the CEO is not linked to the traditional time period.

In the original period, "Littlejohn was a significant contributor to principle development" (Stark, 2013, p. 3). Stark goes on to cite Achorn et al. (1900), who describe Littlejohn's contributions to the osteopathic principles in the area of vital fluids and forces (2013, p. 3).

In a selection of themes appearing in the traditional period, Stark (2013) lists "the integrity of blood flow" and "normal flow of body fluids" among several other guiding principles of this period (p. 4). In 1922, a consensus paper on "the osteopathic view of the human body" was originally published by the A.T. Still Research Institute. This osteopathic view was outlined as follows:

> The blood preserves and defends the cells of the body (2) The nervous system unifies the body in its activities (3) Disease symptoms are due either to failure of the organism to meet adverse circumstances efficiently, or to structural abnormalities (4) Rational methods of treatment are based upon an attempt to provide normal nutrition, innervation and drainage to all tissues of the body, and these depend chiefly upon the maintenance of normal structural relations. (as cited in Rogers, 2005)

Stark quotes Allan A. Eggleston, who, in 1950, offered three "precepts", none of which contain the words blood, artery, fluid, flow, or any other mention of specific fluids in the body. The second of these precepts could allude to inclusion of fluids in its mention of systems; "Mechanical or structural disturbances occur in the body which interfere with, or impeded, the normal functioning of certain of its parts or systems" (Stark, 2013, p. 4). Contrarily, Stark (2013) discovered notes taken by a student in 1950 at the British School of Osteopathy who listed a very different set of principles, which were credited as being "Dr. Andrew Taylor Still's 3 principles" (p. 5). The third of these principles was listed as "rule of the artery – supreme" (Stark, 2013, p. 5). Stark notes that at this time it was "acceptable for individual osteopaths to publish their personal lists of principles in journal articles"; she describes the modern period as being a time when "reflection and consensus regarding the subject of osteopathic principles" (2013, p. 5) was supported.

A text of note from the modern period is "The Osteopathic Concept" written by an eight-member committee of the Kirksville College of Osteopathy and Surgery in 1953. This document was published in the 1954 yearbook. Although it was indicated by the authors that this list of principles was not complete or definitive, the topic headings of the four principles of "The Osteopathic Concept" are as follows: 1. The body is a unit; 2. The body possesses self-regulatory mechanisms; 3. Structure and function are reciprocally inter-related; 4. Rational therapy is based on an understanding of body unity, self regulatory mechanisms and the inter-relationship of structure and function. (Warner et al., 1954)

Absent is any mention of specific fluid in this list of principles that was to be used as a teaching guide. However, under the concept, "the body is a unit," the authors detail that unity is facilitated through the circulatory and neuro-endocrine systems.

In 2002, another committee, including Irvin M. Korr, was formed to examine the principles of osteopathy. They offered the following four tenets of osteopathic medicine:

> 1. A person is the product of dynamic interaction between body, mind, and spirit; 2. An inherent property of this dynamic interaction is the capacity of the individual for the maintenance of health and recovery from disease; 3. Many forces, both intrinsic and extrinsic to the person, can challenge this inherent capacity and contribute to the onset of illness; 4. The muskuloskeletal system significantly influences the individual's ability to restore this inherent capacity and therefore resist disease processes (Rogers et al., 2002, cited by Stark, 2013, p. 5)

In the traditional and modern period there is a marked absence of specific fluids in the wording of the proposed guiding principles. Also, in more general terms, there is little indication within the principles of the traditional and modern periods of how they should

be applied. In an attempt to be inclusive of the broad scope of osteopathy, there is an argument that the principles both sound vague and fail to express the unique nature of osteopathy as it is distinguished from other modalities, if that is indeed a criterion (Fryer, 2011, p. 79-80). It could be argued that the meaning is implied, that the fluid system is one means of creating communication and cohesive dynamic homeostasis, but unlike Still and Frymann's writing, this is not made clear. It would be just as easy to argue that the fascial system facilitates dynamic interaction and the fluids flow within it as this was another prevalent theme in Still's writing. The necessity of clearly worded principles and defined treatment goals becomes clear.

Tom Dummer made a significant contribution of thought to osteopathic principles. In his book, *Specific Adjusting Technique*, he details "A clinical application of Still's principles and precepts" (Dummer, 1995, p. 37). Dummer lists the principles as well as how the information for diagnosis is garnered, such as through palpation and orthopaedic testing, as well as specific examination of the cardiovascular system. Signs and symptoms of cardiovascular disease should be noted and somatic osteopathic lesions that are relevant to the cardiovascular system should be addressed. In *Textbook of Osteopathy, Vol.1*, Dummer (1999) identifies "the rule of the artery" as being the "great basic principle of osteopathy" (p. 50). He reiterates Still's teaching that the body has its own drugstore and the circulation of normal blood flow will initiate the necessary immune defense to ward off disease. In a list of Still's precepts, he lists the first principle as, "the rule of the artery is supreme" (Dummer, 1999, p.50)

A chart in *Textbook of Osteopathy, Vol. 2*, depicts the synthesis between the principle, concepts, and application. Dummer stated that, according to Still, osteopathy is

divided into three categories: matter (structure), movement (function), and force (mind, consciousness, spirit, etc.). He identifies water and air as belonging to the movement category. The depth of the movement category is "profound on the bioenergy level; involving the dysfunction of all tissues with emphasis on the viscera" (Dummer, 1999, p. 63). The table allows students to study the application of concepts. It also identifies that methods of working in the fluids and liquids does not use the same technique approaches as in other fields, such as structural-mechanical. This speaks to the importance of firmly grasping one technique approach before adding another to the repertoire. .

2.3.3. Current debates on osteopathic principles

In March 2013, *The International Journal of Osteopathic Medicine* compiled a special issue on osteopathic principles. In the introductory editorial, Gary Fryer states "Osteopathic principles are generally considered to be the guiding principles for the practice of osteopathy and osteopathic medicine, while also characterizing and differentiating osteopathic practice from other manual therapy and medical disciplines." (Fryer, 2013, p. 1). Fryer summarizes the questions put forth in the call for papers in 2011:

> Have the modern principles condensed and simplified the original meaning of the principles proposed by A.T. Still? Are holism and patient-centered care the defining features of osteopathy? Do these principles differ from country to country? Does osteopathy and osteopathic medicine have characteristic or unique features that differentiate it from other health professions? Is it important to define the principles underpinning osteopathic practice? Are traditional principles consistent with current research evidence? Has the influence of research and evidence-based medicine altered our view of osteopathic principles and osteopathic practice? If not, should they? (Fryer, 2013, p. 1)

In his contribution, Paulus maintains that indeed, a set of principles is needed to keep osteopathy distinct and unique. He stresses that the principles should be "historically accurate" and should reflect the "most exceptional components of Still's teachings" (Paulus, 2013, p. 11). Paulus (2013) further argues that the principles put forth in the traditional and modern periods, which began with "The osteopathic concept" from 1953, were a "vague set of ideas that many non-Osteopathic health care professionals and alternative medicine practitioners also advocate" (p. 12), and proposes ten core principles that "expresses our distinctiveness as Osteopaths" (p. 13). Of the ten principles he proposes, the seventh details the importance of blood flow and fluid flow in the normal anatomy and physiology:

> The goal of an Osteopathic Manipulative Treatment is to restore the natural ability to self-heal – or to creatively compensate – by augmenting the local and global health of the body and by removing obstructions to proper blood flow, fluid flow, or nerve function allowing for the restoration of motion. (Paulus, 2013, p. 14)

Paulus continues by explaining what role this principle plays in osteopathy by indicating that an osteopathic diagnosis is performed by assessing the vitality of the patient. It can be concluded, then, that the vitality of the patient, at least in part, rests in the unobstructed motion of the fluids. Following the diagnosis of vitality, osteopathic manual therapy is performed and then the osteopath allows "nature to do the true work of healing" (Paulus, 2013, p. 14).

Osteopathy can be difficult to fit into the research or evidence-based medical model of health care because not all components of osteopathy are measurable. This debate rears its head in the role of fluid flow in osteopathic treatment and diagnosis.

Certainly, taking a pulse is a means of measuring blood flow as it relates to the heart and pressure within the vessels. This does not reflect all fluid flow in multiple fields, however. When the osteopath releases fluid flow, taking the pulse would not fully reflect this altered state as it only includes the blood and not the complete network of fluids, which also includes lymph, interstitial, intrastitial, and cerebrospinal fluid flow, not to mention the realm of biodynamics. At the present time there are limited means of measuring fluid flow change as a result of manual treatment, except via individual palpatory skills and mastery. These skills of palpation can only be verified by those with superior skills and not with a device or machine. The work of Moskalenko, Kravchenko, and Vartanyan has made great attempts to address this issue in the field of cranial work in particular. Their book, *Fundamental Aspects of Osteopathy*, details measurements of pressure and flow within the cranium before, during, and after osteopathic treatment (2016). If potency originates outside of the body, however, the element of the relationship between the osteopath, nature, the universe, and the patient is still difficult to account for. Paulus includes this debate in his ten guiding principles; he explains that osteopaths work with the tangible or biomechanic field as well as the non-measureable non-material field. Together, the "material and non-material fields coexist simultaneously and are unified in a dynamic state of connected oneness" (Paulus, 2013, p. 15). This dialogue is grounded in Still's writing, as Paulus argues in his article. Still asked, "Does nature have a finer matter that is invisible to us? Life surely is a very finely prepared substance, which is the all-moving force of nature" (1908, as cited by Paulus, 2013, p. 15). Paulus (2013) concludes by explaining that "The tides and the phenomena of primary respiration described by Sutherland are attributes of the non-material." (p. 15)

The importance and the nature of guiding principles are discussed in several articles compiled in the IJOM's *Special Issue: Osteopathic Principles* (2013). Andrew Cotton (2013) argues that "the term 'osteopathic principles' is evocative of something steady, something to rely on, to fall back on when needed" (p. 18) and "Any principle has more functions than the obvious one, as a guide to action. The first one to consider here is a principle as a fixed point of reference" (p. 19). However, he suggests that this has not been the case throughout osteopathic history. Interestingly, Still himself did not leave us with a set of principles (Evans, 2013, p. 47). A divide has occurred between two general groups; one group follows the teachings that Still left us in his writings and the second group argues that osteopathic principles need to evolve and reflect growing research in order to remain relevant. The first group argues that in doing so the attributes that maintain the distinctiveness and unique qualities of osteopathy are lost. Cotton and Paulus suggest that principles grounded in Still's writings will reduce this tendency towards vague wording that fails to differentiate osteopathy from other manual therapies.

Cotton notes, however, that understanding Still's wording is important, otherwise the meaning is lost on the present-day osteopath. He explains,

> This reducing to a core can be seen, for example, in his phrase "The rule of the artery must be absolute, universal, and unobstructed, or disease will be the result" (Still, 1972). Semantically analyzed, this term has little meaning unless one knows what Still meant by "rule". This can lead to a sense that since his principles cannot be fully understood, they must be of limited value.
>
> One must try to see Still's principles in the context of his time to understand what he meant. For example, he also said "the rule of the artery and veins is universal in all living beings, and the osteopath must know that and abide by its rulings, or he will not succeed as a healer." (Still, 1910). A 'rule' here seems akin to a natural law (hence ruling), which is axiomatic or self-evident. (Cotton, 2013, p. 18)

His proposed interpretation of the rule of the artery is "of all nature's rules regarding supply of various fluids to the tissues of the body, the need for timely and free passage of arterial blood and all it contains is the most important imperative to consider as an osteopath when treating disease" (Cotton, 2013, p. 19).

Cotton explains that Still focused on treating the framework, as God and nature will look after the rest, meaning the fluids will then flow unobstructed and in a timely manner. This concept is embodied also in the principle, "structure governs function." It could be interpreted as "physiology is the free-flowing expression of correct and aligned form." Cotton says,

> Still's vision of osteopathy as a virtually universally applicable, drugless manual therapy (the body reliably, and necessarily, "producing its own medicines") is easily dismissed by a modern generation never exposed to the idea that all physiology is form in motion. Freeing form is one of the keys to freeing physiology to act since form and physiology are the same thing. The argument proposed in this essay is that osteopathy is most valuable when deliberately constrained in scope by its principles which allows for the fullest development of principles-dependant analysis and management. (Cotton, 2013, p. 20)

Both Paulus and Cotton argue that osteopathy cannot fit into the evidence-based medical model currently being applied in healthcare because some treatments are not measureable and because applying a set of techniques to a given pathology is non-osteopathic. For Cotton, this is why having a set of guiding principles grounded in Still's teachings is important. He explains that the osteopath must apply the principles and treat accordingly versus the application of best practices.

In the same IJOM special issue, J. Nicholas Penney (2013) agrees that "osteopathic philosophy remains poorly defined" (p. 33). His suggestion is that osteopaths embrace the biopsychosocial model first introduced by George Engel in 1980, as this approach reflects Still's teachings. Penney does not suggest a return to the use of Still's language in the wording of the principles but rather a redefining of the principles written in *Foundations for Osteopathic Medicine* (Ward & Jerome, 1997, p. 1138) which include the BPS mind-body approach, which is supported by clinical research. This will in turn maintain osteopathy's relevancy.

A common thread that exists throughout the articles published in the IJOM special issue is the problem that current osteopathic principles are not unique and distinct to osteopathy. As medical science has begun to embrace more inclusive lenses for viewing patient care, the question arises as to whether any of the principles, current or dating back to Still's writing, succeed in expressing what osteopathy is. Stephen Tyreman suggests that none of the principles really use language that express fundamental diagnostic and treatment tools that only osteopaths use. The principles do not discuss the use of palpation; "Neither do traditional osteopathic principles explicitly mention quality of movement/motion in patients. Range and quality of movement/motion is a key focus for diagnosis and treatment" (Tyreman, 2013, p. 42). Maurice Christopher McGrath also agrees that osteopathic principles do not provide the distinctiveness necessary to distinguish it from other manual therapies. He says,

> No key osteopathic principle is unique or inconsistent with current medical or scientific knowledge. Claiming distinctiveness merely on the basis of the past is to explicitly anchor the profession to the past. Such thinking fails to either engage with the present or lead toward the future. (2013, p. 59)

Dean Tasker (1903) might remind the debaters that a principle is not the same as a definition. A definition is limiting whereas a principle has a sense of universality that goes beyond the limits of what we currently understand something to be. This is a key argument in the debate surrounding osteopathic principles because clearly all is not understood in the workings of the human body and osteopathy. The principles, especially those concerned with the fluid body, need to leave room for future observation and discoveries to take place.

Indeed, J. D. Howell's 1999 article, "The Paradox of Osteopathy" challenged the osteopathic medical profession to define their notion of "distinctiveness." He predicts that osteopathic medicine must define itself as unique to allopathic medicine or risk becoming obsolete. As previously mentioned, in 2002 Felix J. Rogers, along with eight other medical professionals, put forth "Proposed tenets of osteopathic medicine and principles for patient care." In 2005, Rogers published his article, "Advancing a traditional view of osteopathic medicine through clinical practice" again in *The Journal of the American Osteopathic Association*. In the article, he cites two United States studies which reveal that relatively few osteopaths are using osteopathic manual therapy to treat their patients: "Variables influencing the use of osteopathic manipulative treatment in family practice" and "Use of osteopathic manipulative treatment by Ohio osteopathic physicians in various specialties" (Johnson, Kurtz, & Kurtz, 1997; Spaeth & Pheley, 2003, as cited in Rogers, 2005, p. 255).

> Rogers insists that osteopathic medicine is much more than OMT. His main argument is that osteopathic medicine uses unique approaches to musculoskeletal health, initially put forward by Irvin Korr in 1987, which in

> turn preventively treats the multitude of preventable diseases, such as type 2 diabetes and cardiovascular disease which exercise a monumental cost to the healthcare system. (Howell, 2005)

However, his proposed tenets of osteopathic medicine do not identify how osteopaths do this in a unique way. His follow up article, "Defining osteopathic medicine: Can you put your finger on it?" acknowledges that the previous tenets put forth were met with a "lukewarm response" and as an associate editor, introduces a new section for evidence-based clinical reviews to the journal (Rogers, 2010, p. 362).

In 2011, the third edition of *Foundations of Osteopathic Medicine* was released. In it, ECOP's 2009 principles are presented: "(1) The human being is a dynamic unit of function, (2) The body possesses self-regulatory mechanisms that are self healing in nature, (3) Structure and function are interrelated at all levels, (4) Rational treatment is based on these principles." (Chila, 2011, p. 3) *Foundations of Osteopathic Medicine* uses the five model approach to patient care; they are: "(1) Biomechanical, (2) Respiratory-Circulatory, (3) Neurological, (4) Metabolic Energy, (5) Behavioral" (Chila, 2011, p. 5). In the respiratory-circulatory approach, the anatomical elements that correspond to this model are "the thoracic inlet, thoracic and pelvic diaphragms, tentorium cerebelli, and the costal cage"; physiological functions are "respiration, circulation, venous, and lymphatic drainage" (Chila, 2011, p. 5). Clearly, there is an effort to distinguish between osteopathic principles, principles of health, and approaches to patient care. It is a presentation which requires extensive reading and understanding by the student of osteopathy.

Other countries continue to study what role the osteopathic principles play in professional practice. Recently, a constructivist grounded theory qualitative study in the UK on "Osteopaths' professional views, identities and conceptions" was published in the IJOM. It found that "there is little research-based knowledge of how practioners conceive osteopathic practice and how this influences their work" (Thompson, Petty & Moore, 2014, p. 147). The study acknowledges that osteopaths have an individual conception of what it means to practice osteopathy. Importantly, the study found that the way they conceive osteopathy influences how they treat. Further, findings of the study revealed a variety of views on the importance of traditional principles in osteopathy as they shape professional identity and a general conception of osteopathy. For example, some participants embraced the traditional teachings from A.T. Still, while others did not. Also, several participants indicated that they did not view osteopathy as being distinct from other modalities such as chiropractic medicine (Thompson, Petty & Moore, 2014, p. 151-155).

In summary, there is no clear consensus on osteopathic principles internationally. There is, by contrast, evidence that many osteopaths continue to question and debate the current set(s) of principles. There is also evidence that it is important to define osteopathy in some way so that the public and other health practices understand its value so that it be preserved or lost. In the debate on principles, there is a call to produce concepts that are clear, unique, and distinct to osteopathy so that understanding of this field of science will increase. There is also an importance placed on the value of having principles of osteopathy and principles of health as two distinct categories, as this will again ensure the distinctiveness and transparency of osteopathy. Finally, approaches to

patient care must be considered in any debate concerning principles as this directly corresponds to methodology of lesion hierarchy and methodology of treatment as understood through the systems or bodies.

2.5. Conclusion

The aim of this study is to discover how Canadian osteopaths are using the principle, "the role of the artery is absolute" in treatment. Given the current state of research we know that some osteopaths have and are certainly using techniques to increase fluid flow to restore health and function. The review of the physiology literature demonstrates that the fluids work in homeostasis to move resources and remove wastes as the tissue demands. OMT techniques can aid in these processes, particularly in the interstitial and lymphatic vessels. It is questionable as to whether OMT techniques affect fluid exchange at cellular levels given the strong systems of autoregulation that exist. Whether OMT techniques affect CSF movement and glymphatics is still under study.

Still taught that to remove obstructions to fluid flow, tissue alignment must be ensured. This would, in turn, allow the free flow of immunity to ward off disease. Several of Still's colleagues and students documented their case studies and experiments implementing the principles, "structure governs function," "the rule of the artery is absolute," "the body has a system of innate healing," and "the body functions as unit." Some of Still's students organized the principles to place the rule of the artery is absolute under the umbrella principle structure governs function. However, as Sutherland, Frymann, and others later explain, the fluids have a potency unto themselves. This early concept as an important treatment aim, originally taught by Still, is now being taught and

incorporated into the teachings at the CEO. In addition to his inquiry on fluid hierarchy, Still's teaching that fluid drive is a health drive is a key concept.

Many concepts introduced by Still and taught by his immediate contemporaries were concepts of health that does not distinguish osteopathy. For example, the notion that healthy blood and fluid flow must occur on time and in quantity sufficient, as emphasized by Frymann, is not determinate of osteopathy. However, it is of utmost importance that osteopathic students are taught this concept to make clear the goal of treatment. It is not a question of whether this concept should be included but perhaps how it is framed. Knowledge of the history of the teaching may help to secure its place as a guiding principle.

The debate as to the wording and content of the principles is not over. The literature review revealed a number of concepts that osteopaths are observing but that are rarely included in osteopathic principles. The concepts of the PRM and palpation are rarely included in osteopathic principles. This demonstrates that there is a space for further clarification in the documentation of what osteopaths actually do and how they do it. Additionally, a dominant theme that surfaces in the current literature review is the struggle between what can be proven through evidence-based science and what has yet to be proven. This question should figure prominently in a discussion of osteopathic principles.

Upon consideration of the literature review in its entirety, the theme that seems both important and unanswered is the potency, or the vitality, or the health. The approach to treatment is to find the health that drives the fluids that heal the body and

prevent disease. It remains the fact that we do not fully understand the origin of its power but part of its charge that runs through the fluids is what the osteopath seeks to connect with the patient.

3. METHODS

The purpose of this study was to determine how Canadian osteopaths are incorporating the principle, "the role of the artery is absolute" in their practice. A better understanding of this phenomenon could facilitate future curriculum development and may also serve to fuel informed debate regarding its inclusion as a guiding principle with a goal to preserving the unique discipline that is osteopathic practice while maintaining its relevance in an ever-changing healthcare landscape. Five research questions were asked in order to understand the breadth of this phenomenon:

A. What are Canadian osteopaths' understanding of the history of the principle, "the role of the artery is absolute" and what are their perceptions of this principle?
B. Based on their understanding of the principle as well as their education and experience, how do Canadian osteopaths incorporate this principle in their practice?
C. How does this principle factor in terms of their methodology? Meaning how does it emerge throughout the process of health intake, observation, diagnostics, palpation and testing, and approach to treatment and integration.
D. Are there detailed accounts of employing this principle that would potentially lead to quantitative research?
E. Based on their feelings and perceptions of this principle, how do osteopaths view its future inclusion as a guiding principle?

This chapter will describe the research methodology and includes discussions on the following: a) rationale for research approach, b) description of the research sample, c) summary of the information needed, d) overview of the research design, e) methods of data collection, f) analysis and synthesis of data collection, g) ethical considerations, h) issues of trustworthiness, and i) limitations of the study.

3.1. Rationale for Constructivist Grounded Theory Approach

This thesis will take a mainly constructivist grounded theory approach. A constructivist position allows an interactive, "participatory, and reflexive" role (Thompson, Petty, & Moore, 2014, p. 172). Analysis in constructivist grounded theory results when "codes and categories are actively constructed through an active interpretive process" and "theory is constructed and represents a re-construction of multiple realities" (Thompson, Petty, & Moore, 2014, p. 172). The aim of using a grounded theory approach is to develop theory based on the coding and categorizing data and the analytic procedures that follow. The theory is grounded in and emerges from the data, following inductive analytical strategies.

Charmaz (2004) summarizes several characteristics that define grounded theory (p. 497), and which informed this research. The first is that the data collection and analysis phases occur simultaneously: this allows for further data collection to "support emerging themes and questions" (Charmaz, 2004, p. 500). Another characteristic, delaying the literature review, allows the researcher to make their "analysis more abstract and [their] rendering and grounding of it more concrete" (2004, p. 516). For example, in this study, the researcher did not know whether Canadian osteopaths understood the

implied meaning in the principle, "the role of the artery is absolute." Further, the researcher did not know how perceptions of this principle would affect their application of it. In the interview phase of this study, the emerging data suggested that participants' historical knowledge of the principle, their conception of the principle's intended meaning, and their own post-graduate study relating to fluid flow and fluctuation all factored in to how they incorporate the principle. In light of this, the researcher continued to probe deeper in the literature and in subsequent interviews to reflect these emerging questions and theories. The conceptual framework (see Appendix 8) became dynamic as the generated data presented new categories and simultaneously became more focused as the content of the data indicated that certain themes (such as, but not limited to, perceptions, attitudes, and feelings about the principle itself) were important.

Additionally, in grounded theory research analytic codes and categories develop from the data and not from pre-conceived hypotheses (Charmaz, 2004, p. 497). In the proposal that preceded this study, possible codes and categories were presented based on the researcher's knowledge. These were immediately and fundamentally changed after the first interview because the data generated from it suggested a scope of investigation that was previously unknown to the researcher. The coding and categorizing continued to emerge as subsequent data was presented. During this process, the development of middle-range theories occurs, explaining behaviour and processes (Charmaz, 2004, p. 497).

Memo-writing is a crucial intermediate step between coding data and writing first drafts of analysis. This results in the ability to elaborate processes, assumptions, and actions that are subsumed within the code. Ultimately, in a study such as this where

there is a large quantity of data generated, memo-writing allows the researcher to make sense of the data, see emerging patterns, and use the data to illustrate points (Charmaz, 2004, p. 497, 511). Theoretical sampling helps to construct theory as opposed to acquiring a representation of a given population. This study sought to develop theory that would explain participants' perspectives on the principle and to explore how they use the principle in practice, as opposed to surveying the greater osteopathic population in Canada.

Given the broad nature of this study, a grounded theory approach – as outlined by Charmaz – was the best research approach to use in order to develop theories that emerge from the data, are guided by the literature, and explain the phenomena at hand.

3.2. Research Sampling Strategy

The aim of the sampling strategy was to choose Canadian osteopaths who are actively practicing and engaged in research or curriculum development in the field. This is a "purposive sampling (which) involves the intentional selection of information-rich cases from which one can learn a great deal about the issues of central importance to the purpose of the research" (Patton, 2002, as cited in Thompson, Petty, & Moore, 2014, p. 175). The goal was to find and interview expert Canadian osteopaths.

The reason for the purposive sampling in this study was to generate focused data that could then result in debate or ongoing discussion regarding "the role of the artery is absolute" as a guiding principle. Therefore, the participants must be in some way linked to the CEO. Further, the snowball effect produced a very effective sample pool because osteopathic knowledge and post-graduate areas of study are not always made available to the public. The aim was to generate a theoretical sampling group who knew or who were

interested in osteopathic principles or specifically osteopathic work relating to fluid fields who could contribute to the evolving theory of the study. The aim was not to document a general survey representative of all Canadian osteopaths' perceptions of and use of the principle, "the role of the artery is absolute."

3.2.1. Sampling group

The population for sampling is Canadian osteopaths who:

- Received their osteopathic education from a college with a minimum of 1000 hours
- Have a minimum of 10 years experience working as an osteopath after graduation
- Or who have a minimum of 5 years experience and who have published work that is osteopathic
- Or are or have been a faculty member at the CEO, the CCO, or any other recognized osteopathic institution(s) internationally
- Or have presented research or who have given courses at international osteopathic conferences with a minimum of 5 years post graduate working experience.

The initial plan was to use Canadian osteopathic association(s)' databases, but the small sample pool meeting the above criteria served as the main source of recruitment. Participants were either contacted via email or asked in person whether they would consider being a participant in the study. Thirteen osteopaths were contacted and 10 responded and agreed to participate, resulting in a 77% response rate.

3.3. Overview of Information Needed

In qualitative studies, contextual, perceptual, demographic, and theoretical information is typically needed (Bloomberg & Volpe, 2012, p. 105).

3.3.1. Contextual information

One of the aims of this study is to understand the learning behaviours of Canadian osteopaths; therefore, the contexts within which they work, reside, and were educated are pertinent. Lewin (1935) wrote "[Contextual information] is essential information to collect when doing a case study set in a particular site or multiple similar sites because elements within the environment or culture may influence behavior" (as cited in Bloomberg and Volpe, 2012, p. 105). Therefore, this study also includes a review of support material used by the college, in the form of course handouts, to introduce the guiding principles. Further contextual information is also presented in section 4.1.1.

3.3.2. Demographic information

Participants were asked to fill out a personal data sheet to record demographic specifics. The data sheet (see Appendix 5) reflects age, gender, province of residence, college and campus attended, previous and post-graduate education and courses, number of teaching years, number of published articles or books, and number of international osteopathic conferences attended. The demographic matrix helps to reveal why participants may have answered a certain way depending on the question asked. For example, an interview question concerning a learning experience as an undergraduate student will vary depending on how old they are and what years they studied.

3.3.3. Perceptual information

In this grounded theory study, perceptual information that was gathered in the interview stage was highly valued. The perceptual information gathered was key in explaining why certain participants use the principle, "the role of the artery is absolute" in their practice and how it has evolved over time. For example, one participant indicated that during his undergraduate experience, he felt more negatively toward the principle but now feels more positively as he as grown to understand it. His perception changed over time due to increased understanding and his own maturity as an osteopath. Perceptual information also highlights what participants deemed as important. Interview questions 3, 4, and 5 were all concerned with how the principle is incorporated in relation to pathology. These questions garnered a long list of potential pathological states but the participants' perceptions were generally that thinking in this way was non-osteopathic. The perceptions were in fact more valuable than the base data.

3.3.4. Theoretical information

The theoretical information researched included books and journal articles on qualitative research and grounded theory methods. A historical literature review was conducted to find out what is known about the origins of the principle, "the role of the artery is absolute," and a current literature review was conducted to discover how osteopaths are incorporating fluid work in their practice. The review of current literature also gave information about the use of the guiding principles in osteopathic practice around the world.

Table 1. Overview of methods to obtain the information needed

Type of information	Required information	Method
Contextual	-History of the principle "the role of the artery is absolute"; -Lineage of how it came to be included in the CEO principles; -Discussion of the wording of this principle 'rule' vs. 'role; -How the CEO was founded; -Statement of CEO mission, values, and vision*; -Statement of osteopaths' perception of osteopathic culture in Canada	-Literature review -Interview with key informant -Interviews
Demographic	-Descriptive information of participants See Table 1	-Survey/data sheet
Perceptual	-Participant's descriptions and explanations of their experiences as it relates to the principle under study	-In-depth interview (see Table 3)
Theoretical	-Support for methodological approach -Support for understanding of the contextual information -Support for analysis -Support for conclusions	-Literature review of texts and articles on methodology -Historical and current literature review -Historical and current literature review, concept map (appendix 10), conceptual framework (appendix 8), interpretive outline tool (appendix 9) -Historical and current literature review, including college handouts on principles, Consistency of findings, (interpretations, and conclusions (appendix 11)

(Bloomberg & Volpe, 2012, p. 107)

*The extensive contextual information on the CEO is required because the intent of this research is to provide a document which might be helpful in future pedagogical development at the CEO

3.4. Research Design Overview

Preceding the proposal defense and data collection, a selective historical review of the literature pertaining to the historical origins of the principle, "the role of the artery is absolute" was conducted. A selected review of general principles of osteopathy was also conducted. A selected current literature review on the ways osteopaths are using blood flow in diagnostics and treatment was conducted.

The researcher acquired approval to conduct this study following the proposal defense in front of a jury. The proposal included a problem statement, research questions, and context for the importance of the study. Chapter 2 of the proposal included a selective literature review and Chapter 3 included the proposed methodology for the study. The methodology chapter was also approved by a methods expert from Dalhousie University, Halifax, Canada. The proposal also outlined all proposed procedures for the gathering of data from human subjects and the modes of assuring their confidentiality, informed consent, and respect.

Potential research participants were contacted in person or by email. Those who agreed to participate were sent an informed consent document which contained several examples of the nature of the questions that would be asked. They were also sent a demographics data sheet. Paper copies were supplied to all participants at the time of the interview.

Semi-structured, in-depth interviews with ten experts in the field of osteopathy in Canada. All participants were in some way, at some time affiliated with the CEO.

One interview was held with a key informant.

Interview data responses were transcribed verbatim using InqScribe software. Line-by-line coding was used to generate categories which formed the basis for the analysis. Emerging analysis shaped the on-going data collection.

Once each interview was transcribed, the transcripts were emailed to each participant for verification of intent and correction.

The literature review was ongoing and continued post-interview stage. The three literature topics reviewed for this study were historical literature containing the origins of the principle, "the role of the artery is absolute", a selective current literature recounting ways that osteopaths are using fluid flow in their diagnostics and treatment, a review of current literature on the anatomy and physiology of fluid flow, and finally a current literature review on the guiding principles of osteopathy and osteopaths' views on those principles.

3.5. Data Collection Methods

Bloomberg and Volpe (2012) suggest employing several means of data collection in order to add rigor, depth, and breadth to research work.

This study used two: demographic data sheet, filled out by each participant, providing essential contextual background for the information gathered in the interview phase, and interviews. The primary method for data collection in this study was one-on-one in-depth interviews with experts in the field of osteopathy in Canada. The researcher used an interview guide and the interviews were semi-structured in order to generate data that was rich in detail. The interviews were designed to be 30 to 45 minutes in length. The researcher made every attempt to capture the meaning of the experiences that were described in the interviews. Kvale and Brinkmann (2009) wrote that the qualitative

research interview is "an attempt to understand the world from the subject's point of view, to unfold the meaning of the subject's experiences, to uncover their lived world" (as cited in Bloomberg and Volpe, 2012, p. 121). The aim, therefore, was to ask open-ended questions, eliciting rich and deep content and leaving with valid information.

The interview questions were discussed with the thesis advisor before the first interview. Several of the questions were also discussed or were derived from discussion with CEO teachers. The first participant was chosen based on a high level of expertise and the data obtained in the first interview was used to obtain as large of a breadth as possible of content in all of the future interviews. The following matrix correlates the interview questions with the research questions.

Table 2. Research Questions and Interview Questions Matrix

Interview Questions	Research Questions		
1. What is your understanding of the principle, "the role of the artery is absolute"? What is your understanding of where it came from? What is your understanding of who wrote those words? What do you understand the CEO to mean when it teaches this principle?	What are Canadian osteopaths' understanding of the history of the principle?	Do Canadian osteopaths understand the implied meaning of the principle? Are Canadian osteopaths aware of the wording change from role to rule and why?	How does their interpretation of the principle translate into the use of the principle? What are their attitudes and perceptions of the principle?
2. How do you incorporate the principle, "the role of the artery is absolute" in your practice? (Diagnostic and/or treatment)	Are osteopaths in Canada using the principle in study to guide testing and treatment?	How is this principle used, directly or indirectly?	How does this principle influence Canadian osteopaths?
3. Methodologically speaking, what role does this principle play? Meaning, is a primary goal to increase blood flow or free neurovascular pathways (for example)?	How is this principle used, directly or indirectly?	What tests and/or techniques are being used to increase blood flow?	Do osteopaths consider fluid pathways or the vascular tree to be high in the methodology?

4. Have you noticed any key successes in the history of your practice when blood or fluid flow was improved? How did it come about?	Are osteopaths using this principle with specific target groups or pathologies?	What target groups or pathologies benefit significantly from increased blood or fluid flow?	Is there a case study that the participant feels was significant, as it relates to this principle?
5. Is there a target group where you find yourself trying to increase blood flow or freeing fluid pathways as a primary goal? Why	Are osteopaths using this principle with specific target groups or pathologies?	What target groups or pathologies benefit significantly from increased blood flow?	
6. Are there instances in your practice when you find that the application of this principle leads to consistent results? Such as Still's teaching, "turn in the ovarian artery" (Connor, 1928, p. 15) in stalled labor?	Are osteopaths using this principle with specific target groups or pathologies?	What target groups or pathologies benefit significantly from increased blood flow?	Is there a specific tool osteopaths are using to increase blood or fluid flow in a particular pathophysiological state?
7. Did you learn techniques or methodology to support this principle in school or post grad? Sub-questions: Was there a key mentor, teacher or author who really awakened this in your awareness? Or perhaps a difficult case or pathology? Was your learning experience incidental or otherwise? What was your professional development that lead you to use this principle?	What are osteopaths' perceptions of when (or if) this principle came into their awareness and implemented into clinical practice and how?	Do osteopaths perceive that they received a strong foundation in the principle in their osteopathic (undergraduate) training?	What was the key element that prompted the presence of this principle in osteopaths consciousness?
8. Do you have any thoughts or suggestions on how to best transmit this knowledge to students of osteopathy?	Can this thesis be of use to future curriculum development?	Do osteopaths perceive that they had a strong foundation in the principle in their osteopathic (undergraduate) training?	What are osteopaths' perceptions of this principle as being included in the set of four guiding principles at the CEO?

The interview process began with the researcher approaching the potential participants either in person or by email to ask whether they wanted to be a participant in the study. The nature of the study was briefly explained and the intended length of the interview was mentioned. Participants were informed that they would also have to fill out a demographics data sheet. If participants agreed to be a part of the study, the researcher asked them to choose a suitable time and place. An informed consent form was emailed to each participant before the interview. The consent form included a selected list of questions that reflected the general breadth of the interview. At the time of the interview, a paper copy was presented to each participant, reviewed together with the researcher, and signed. Participants were assured that they had the option to remove themselves as participants from the study at any time and that their participation would remain confidential. Interviews were recorded using an iPhone voice memo software and transcribed verbatim using InqScribe software. Copies of the transcripts were emailed to each participant. Each participant was asked to review the transcripts and confirm that it reflected their intent. They were also asked to make any corrections and to provide any further information that they thought pertinent.

3.5.1 Literature review

Although a preliminary literature review was conducted before data collection, a much more thorough literature review was done throughout and after the interview process. The literature review was largely selected based on the data obtained in the interview phase, which is consistent with grounded theory methodology. Glaser and Strauss (1967) noted that

> grounded theory starts from a different set of assumptions than traditional quantitative research design. The inductive nature of these methods assumes an openness and flexibility of approach. Thus, you follow the leads gained from your view of the data, not from the careful and exhaustive literature review of the traditional research design. (as cited by Charmaz, 2004, p. 516)

Mind-mapping of Still's work was conducted to generate themes and to then map how the concept of "the rule of the artery is absolute" came to be a guiding concept. A similar process was used with Sutherland's work to study how the concept of "the artery is supreme, but the CSF is in command" emerged.

The key informant in this study was Philippe Druelle, who founded the CEO. A list of who influenced him to choose the principle, "the role of the artery is absolute" as a guiding principle was provided to the researcher in the interview. The researcher then conducted a literature review of the authors and mentors listed. Philippe Druelle also stated that although the wording of the principle indicates the importance of blood flow, the correct interpretation includes more than just blood. This is indicated in the change of the word "rule" to "role"; there is one rule, the rule of nature, but there are many roles. Therefore, the researcher conducted a physiology and anatomy literature review which included lymph flow, concepts in vasomotion, CSF flow, and glymphatic flow. The key informant is included in the participant data, totalling ten participants.

As the interview phase proceeded over the course of 15 months, it became clear that people's perceptions of how they viewed the principle, "the role of the artery is absolute" and their interpretations of it greatly influenced whether they use the principle and, if so, how. The researcher then conducted a literature review of articles on current views of osteopathic guiding principles.

3.6. Methods for Data Analysis and Synthesis

In this grounded theory study, data and analysis occurred simultaneously. This allowed the researcher to generate theories from the data itself. As Charmaz (2004) describes, "The hallmark of grounded theory studies consists of the researcher deriving his or her analytic categories directly from the data, not from preconceived concepts of hypothesis" (p. 500). The categories which emerge from the line-by-line coding process of the interview transcripts are a result of the data. The data is the result of an interaction between the researcher and the participant or the observer and the observed. The researcher therefore has a role to play in the emerging data. The researcher does not have a preconceived hypothesis but rather an area of inquiry as a point of departure. Charmaz (2004) explains, "Grounded theorists attempt to use their background assumptions, proclivities, and interests to sensitize them to look for certain issues and processes in their data" (p. 501). Importantly, if the data does not fit with the original interest of the researcher, the researcher then re-evaluates the scope of the study. The researcher does not try to fit the data into their area of interest and instead, follows the emerging leads. This researcher began with an interest in blood flow and the principle, "the role of the artery is absolute." Prominent leads which emerged from the data were that the principle could not be limited to blood flow and perceptions of the principle strongly influenced its use. These are an example of crucial topics that needed to be included in the scope of the study.

Focusing the data occurred by shaping the questions that were asked in the interview process. Questions were either expanded upon or rejected depending on the data generated. The researcher made an attempt to gain dense, rich descriptions and to

learn what was between the lines or unstated, much in the way Sutherland studied Still's writing by reading between the lines. In some cases, participants declared early in the interview that they did not use "the role of the artery is absolute" as a guiding principle. This proved not to be a black and white statement. The researcher did not eliminate these participants but instead embraced them and questioned their thoughts, feelings, and interpretations of the principle. The researcher also further questioned the participants who voiced this opinion as to whether they include fluid flow in their diagnostics and treatment. Certainly, every participant did in fact incorporate this concept into their practice even if they refused to embrace the principle itself. In this way, the theoretical categories and analysis include the nuances of not only the data but the intent and meaning behind the data. Charmaz (2004) lists the layers of meanings that should be included: "the person's (1) stated explanation of his or her action, (2) unstated assumptions about it, (3) intentions for engaging it, (4) effects on others, (5) consequences for further individual action and inter-personal relations" (p. 504).

Software was not used to generate codes and categories in this study for two reasons. The researcher recognized that because many participants were not native English speakers, the language used may not be consistent enough for a software program. The researcher wanted to ensure that the complexities and subtleties of the data were in fact fully represented in the analysis and theory development. Secondly, the researcher wanted to develop codes by studying the emerging data. The coding process was multi-layered, meaning the researcher did not code only once but several times as the researcher's own knowledge grew and analysis occurred. This was also why the researcher used InqScribe and not software that would automatically type from the voice

recordings. The researcher made every attempt to be aware of the implied meanings in the audio recordings and listened to them multiple times.

The coding process began with line-by-line coding with some basic questions provided by Charmaz (2004)

> 1. What is going on? 2. What are people doing? 3. What is this person saying? 4. What do these actions and statements take for granted? 5. How do structure and context serve to support, maintain, impede, or change these actions and statements? (p. 507)

These questions serve to try to understand rather than record facts. The coding process had several layers. The researcher conducted some initial coding to see what categories might be emerging. These categories were written on large sheets of paper and taped to the wall. Research questions that were addressed were written underneath. Future questions about the process were also written to shape further analysis and to shape future data collection. The goal of the second phase of coding was to generate more focused coding in an attempt to capture the data. These focused codes were in some cases raised up to form categories.

Gaps in the categories were then discovered through the use of the interpretive outline (see Appendix 10) and the conceptual map (see Appendix 11) that were constructed from the data, along with memo-writing in response to and to reflect on the data. The gaps in the categories indicated that the initial categories did not fully depict the experience detailed by the participants. New categories were constructed, comparisons were made between categories and data was checked to again corroborate their validity. Finally, the researcher created a matrix to demonstrate the development of theory and consistency from findings, to interpretations, to conclusions and recommendations (see Appendix 12).

Charmaz (2006) says that saturation occurs when the researcher no longer finds evidence from the data to spark new theoretical insights (p. 113). In grounded theory, saturation does not occur when patterns are repeating but when elements of the pattern cease to emerge. The researcher made an attempt to avoid mundane or trivial categories in order to pre-emptively achieve data saturation.

3.7. Internal Validity of the Study

Strategies used to increase the validity of the study are as follows:

- The proposal was presented to Barbara Keddy for review of proposed methods.
- Pretesting interview and observation: Pretesting the interview questions through discussion with the advisor and CEO teachers and reconsidering the breadth of the study after the first interview. The first interview provided data that exceeded the initial scope of the researchers questions. Subsequent interviews were allowed to include this breadth based on their own understanding of the principle in question.
- After the interview, transcripts were made available so that participants could corroborate raw data.
- After the interview phase and after the observation phase, analysis of data was presented to the advisor.
- Triangulation of data was achieved through multiple sources of data collection: literature review, demographics data sheet, and in-depth, one-on-one interviews.
- Memo writing contributed to an audit trail to "demonstrate how the study was conducted and explicate how the theory was developed" (Thompson, Petty, & Scholes, 2014, p. 178).

3.8. Bias and Subjectivity Management

The original idea for this thesis came from the Canadian osteopath and historiographer, Jane Stark. During a course that she taught in Halifax in 2013, she discussed her research of Still's osteopathic principles. She mentioned that a possible research topic regarding the principle, "the rule of the artery is absolute" might be of interest. When the proposal for this study was written, the researcher did not fully understand the meaning of the principle itself. Early bias existed due to lack of knowledge on the part of the researcher and influenced the initial interview question content. Throughout the process, the researcher made every attempt to generate data beyond her field of knowledge and to integrate the literature review in the process based on emerging data.

The aim of this research is to gather data with an objective point of view and not attempt to skew the data in the wording of the interview questions, in the coding and category creation, or analysis. The pre-reader and advisor were asked if this is occurring throughout the process. A journal log was kept of the research process and includes reflections on possible bias during each phase.

3.9. Data Saturation

By keeping the sampling strategies specific, the data saturation point should be achieved with fewer numbers than in a broader study. For this study, ten participants were chosen for data saturation. Data saturation occurs when no new information can be gathered, no new conclusions can be made, and no new patterns emerge. This may be challenging given that one of the aims of this study is to discover where osteopaths are

acquiring the knowledge and skill to treat blood and fluid flow above and beyond their undergraduate study. In post-graduate study, this could be anywhere.

Extreme cases will be noted, categorized, and analyzed separately to give depth and breadth to the research. Extreme or deviant cases are a form of purposive sampling and are examples of unusual cases where the outcomes offer significant insight. They will be analyzed with reflections on the literature. Extreme cases will be embraced as they could be reflective of very interesting and pertinent work.

3.10. Ethical Considerations

The participants in this study were informed and respected. Written informed consent was required from each participant and was gathered before the interview occurred. The confidentiality and anonymity of the participants will be upheld.

Participants were informed that they have the right to withdraw from the study at any time.

3.11. Summary

This chapter details the methodology framework within which this study was conducted. Grounded theory allowed the researcher to build theories based on the emergent data generated from semi-structured interviews. The semi-structured interviews were of roughly 30 to 45 minutes in length and the researcher made every attempt to garner information that was rich in detail. Purposive sampling of 10 participants was used as the intent was to uncover how experts in the field of osteopathy incorporate the principle in question. Two data collection methods were used, including a demographics data sheet and semi-structured interviews; triangulation was attempted via the literature review. This method of triangulation was advised by the proposal jury.

The literature review and memo-writing also served to build the conceptual framework for the design and analysis portions of the study. The intent of this study is to bring to light a historical account for the evolution of the principle, "the role of the artery is absolute" and to contribute to the understanding of it. It is the researcher's hope that this study will help fuel debate regarding osteopathic guiding principles.

4. RESULTS

4.1. Introduction and context

The initial research question this study posed was concerned with how Canadian osteopaths incorporate the principle "the role of the artery is absolute" in their practice. This grounded theory approach allowed for emergent categories and this chapter will reveal how the data unveiled both the answer to the research question and categories beyond the initial question.

This chapter will begin with some contextual information about the CEO, as all the participants are affiliated in some way. The researcher will review several documents that are made available to CEO students, as well as documents posted on the CEO and CCO websites.

Following this description, results from the first mode of data collection will be presented. The demographics data sheet will provide the reader with further contextual information concerning the participants in the study. The data sheet is available in Appendices 5 and 6.

Results from the second mode of data collection, the interview phase, will follow. The interview phase began with one-on-one semi-structured interviews which were then transcribed verbatim using InqScribe software; transcripts were then coded and categorized. Data sheets for the interviews are available in Appendix 7. The process of manually coding, re-coding, and categorizing also included memo- and journal writing. Through this in-depth study of the data, the emergent categories began to reveal some prominent themes. Following grounded theory methodology, the data was coded based

on language and content. Although the research questions were addressed in the interview questions and were referred to throughout the process of analysis, the categories were not bounded by them; instead, the categories reflect the data and, as a result, some of the prominent themes that emerged are in addition to the initial research query.

4.1.1. The CEO/CCO

The CEO was founded in Montreal in 1981 by Philippe Druelle, D.O., with the help of Jean Guy Sicotte, M.D., D.O. The goal of the college was to teach traditional osteopathy alongside other osteopathic modalities, such as myofascial release, osteoarticular adjustments, visceral manipulation, and treatment of the cranial sphere.

The values expressed by the college include, but are not limited to, the importance of teaching traditional osteopathy, a commitment to teaching at the university level, and the space for each student at the college to develop their unique talents and personality during their studies at the college.

The CCO (2016) defines traditional osteopathy as:

> A natural medicine which aims to restore function in the body by treating the causes of pain and imbalance. To achieve this goal the Osteopathic Manual Practitioner relies on the quality and finesse of his/her palpation and works with the position, mobility and quality of the tissues.

The concept of natural medicine means that nothing is added to or taken away from the body. (ex. Pharmaceuticals.) (ex. Surgery.) It involves the tenet that the body has innate healing properties and is capable of healing itself.

Palpation is cited in the definition of traditional osteopathy as the key tool for the osteopathic manual practitioner. The Glossary of Osteopathic Terminology prepared by

ECOP (2006), which is given to first year students, defines palpation as, "The application of the fingers to the surface of the skin or other tissues, using varying amounts of pressure, to selectively determine the condition of the parts beneath" (p. 13). According to the CCO website, a list of tissue qualities the skilled practitioner may palpate include "congestion, dehydration, scarring, stiffness, density, and loss of resilience, as well as motility, which is an infinitesimal movement inherent to all living tissues" (2016). Treatment priorities are based upon palpation diagnostic results in combination with the position, mobility, vitality, and quality of the tissue.

Uniquely, the CCO explains clearly the role of fluids and liquids in terms of health as well as its role in osteopathic evaluation and treatment. It is the unimpeded flow of the fluids and liquids, which may include "blood, lymph, synovial fluid, digestive juices, cerebrospinal fluid, axoplasm, and all other intracellular fluids of the body" (CCO, 2016), and the life-sustaining compounds they carry that give forth the concept of innate self-healing. These compounds include "hormones, enzymes and their secretions, immune and anti-inflammatory factors, neurotransmitter impulses, nutritional elements, and such dissolved gases as oxygen" (CCO, 2016). Any obstacle, whether structural or non-structural in nature, that may disrupt this flow is of a primary concern to the osteopath. As tissue damage could result from "[any] form of obstruction, compression or stasis of the circulation" (Druelle, 2005, p. 6), normal blood circulation is important for the maintenance of health and this follows the principle of "the role of the artery is absolute."

This context provides a clear point of view on behalf of the CEO/CCO; the principle, "the role of the artery is absolute" is incorporated in service of health. To

achieve this goal, other principles may be employed. The pathways of fluids and liquids are to be kept clear and flowing by removing obstacles or pathophysiological states which might undermine their health potential. Therefore, the implication is that the osteopath must be minimally aware of the fluids and liquids via palpation but the method chosen for treatment may be indirect. For example, removing a discocorporeal lesion that was impacting the sympathetic ganglion lying anterior to the vertebra and thereby influencing the arterial blood flow is incorporating the principle "structure governs function" but also "the role of the artery is absolute." To incorporate the principle, "the role of the artery is absolute," the osteopathic manual practitioner need not use direct means of treatment. This is quite different from other principles with direct means of treatment, and which may be more tangible to the fledgling osteopath.

4.2. Demographics Data

The demographics data sheet was used to provide context to the study.

The results of this first round of data collection confirmed that each potential interviewee was qualified to be a participant as per the outlined requirements in the methods.

The findings were as follows:

1. The majority of participants have over 10 years of osteopathic teaching experience.
2. An overwhelming majority of participants have a minimum education of a Bachelor of Arts or Sciences and half of the participants have a master's-level degree in addition to their osteopathic studies.
3. Over half of the participants have one or more publications.

4. An overwhelming majority of participants received their diploma of osteopathic manual practice from the CEO/CCO.
5. Half of the participants indicated their province of residence as Quebec.
6. Over half of the participants have attended 20 or more conferences.
7. Half of the participants are female and half are male.
8. Participants are almost evenly distributed between 3 clinic types: solo practitioner, multidisciplinary clinic, and osteopathic multi-practitioner.
9. Most of the participants are between the ages of 40 and 49 years of age and all are over 40 years of age.

Demographics Finding 1: The majority (80%) of participants have over 10 years of osteopathic teaching experience.

Of the 10 participants, 70% have 10 to 20 years of osteopathic teaching experience and one participant has over 20 years. Only one participant had fewer than 5 years of experience.

Demographics Finding 2: An overwhelming majority (90%) of participants have at minimum a Bachelor of Arts or Sciences and half of the participants have a master's-level education in addition to their undergraduate osteopathic studies.

Participants were asked to indicate what other education they had in addition to their osteopathic studies. This is of interest because the CEO does not require a university-level education in order to enter the osteopathic study program (CEO, 2012, p. 2). Participants in the study therefore represent a relatively highly educated population within the field of Canadian Manual Practitioners.

Demographics Finding 3: Over half (60%) of the participants have one or more publications.

Having published work indicates a high level of academic merit. 60% of the participants have one or more publications and 20% of those have over 5 publications. 40% of participants have no publications.

Demographics Finding 4: An overwhelming majority (90%) of participants received their diploma of osteopathic manual practice from the CEO/CCO. All participants graduated before 2011.

This study limited the scope of participants to being, in some way, affiliated with the CEO. The researcher did not actively seek out practitioners who were educated at the CEO. Two participants received their Master's in osteopathy from other institutions.

Demographics Finding 5: Half (50%) of the participants indicated their province of residence as Quebec.

The provinces of residence were Nova Scotia, Quebec, and Ontario. The researcher maintains that the scope represents Canadian osteopaths because several of the participants teach in Western provinces.

Demographics Finding 6: Over half of the participants have attended more than 20 osteopathic conferences.

Demographics Finding 7: There are even numbers of male and female participants.

The researcher did not actively try to seek out evenly proportioned gender representation.

Demographics Finding 8: Participants are almost evenly distributed between 3 clinic types: solo practitioner, multidisciplinary clinic, and osteopathic multi-practitioner.

Forty percent of participants work in a clinic setting where there is more than one osteopath. 30% of participants work in a clinic where they are the only practitioner. Thirty percent of participants work in a multidisciplinary clinic where other therapeutic modalities are being practiced. These include naturopathic medicine, psychology, and physiotherapy.

Demographics Finding 9: Most of the participants are between the ages of 40 and 49 years of age and all are over 40 years.

The ages of the participants range from over 40 years to under 80 years.

The results of the demographics data sheet reveal a population of mostly CEO graduates who have a significant amount of teaching experience, have a high level of education, contribute to academic research, and attend a large number of osteopathic conferences. They are evenly proportioned in gender and are representative of a range of ages.

4.3. Interview Data

The following is a presentation of the findings from the interview stage of data collection. The key findings will be listed in order of the most robust data to the least. Research questions that were answered in the interview process will also be included in the findings report. Although the key findings are robust, some of the nuances from secondary findings are of value to the scope of the study. It is in the nuances where

sometimes the deep knowledge that the participants have is illustrated. These nuances will be presented alongside the major findings. The major findings are:

1. An overwhelming majority of participants treat the circulatory system, the fluids and the liquids. The majority of participants incorporate the principle, "the role of the artery is absolute" in treatment.

2. An overwhelming majority of participants use indirect techniques and the majority of participants assess and treat the fluids and liquids via the vascular tree, the tubing, and the flow.

3. No participants felt that they learned how to directly treat the liquids and fluids in their undergraduate osteopathic studies. Over half of the participants learned primarily from a mentor after grduation.

4. The majority of participants use the concept of the long Tide or biodynamics as an integration tool.

5. The majority of participants believe the principle is grounded in Still's work and know the wording was changed but they are not sure by whom.

6. Only a few participants clearly demonstrated their understanding of the principle to include all flows and fluctuations of fluids and liquids.

7. Only a couple of participants expressed that they like the wording of the principle the way it is.

8. Many participants either felt that techniques to treat fluids and liquids needs to be improved or that the teaching of the principles needs to be improved at the undergraduate level.

9. Participants did not feel that they actively applied the principle in cases of pathology. Participants did find that for certain pathophysiological states there was a direct relationship between outcome success and liquid and fluid flow treatment.

Finding 1: An overwhelming majority (9 out of 10, or 90%) of participants treat the circulatory system, the liquids, and the fluids.

The main research question in this study was, how do Canadian osteopaths incorporate the principle, "the role of the artery is absolute" in their practice? The data suggests that whether they feel that they incorporate the principle or not does not necessarily reflect the outcome that almost all of the participants treat the liquids and fluids. Therefore the key finding in the study is that experts in osteopathy who live in Canada, most of whom graduated from the CEO, are treating the liquids and the fluids. This was expressed as a prevalent theme in treatment either by way of the circulatory system or the liquids and fluids generally.

The majority (70%) of participants incorporate the principle, "the role of the artery is absolute" in treatment, albeit at a variety of levels. At a fundamental level, Participant 9 incorporates the principle in the following way:

> You would want to make sure there is proper nutrient flow coming into an area, new blood, new oxygen, nutrients that's coming in to feed the area, and also that debris is taken away, any cell by-products are taken away and toxic irritants, any remnants that is left within the area after injury or after a state…, that also has to be taken away.

Participant 2 gave a similar explanation:

> So how do I use it in my practice? I use it all the time. I use it everyday because I'm interested in making sure there is good blood supply to the tissue, I'm a big believer in the fact that Dr. Still was teaching that the equivalency

between farming-farmland and the human environment and if you want crops to grow you have to have good soil, you need good nourishment of water and you have to have good food inside the soil and so the human tissue is just like a garden and if you want a patient's tissue to be healthy then it has to have good blood supply and good drainage. If it doesn't have good blood supply and you have a soggy field then so the seeds can't sow and if it has too dry of a blood supply then you have a dry field and it doesn't have enough nourishment enough water it can't grow. So either way the tissue isn't healthy so I use that as a parallel in my mind. So I'm always using it, always thinking about making sure that the blood supply is either opened up before you do a set of techniques or afterwards to drain, to nourish the body from the techniques that you've done. So, but I mean, even in the autonomic nervous system course and the autoregulation course we teach a technique to restore the neurological supply to the artery to make sure there was no spasm inside the length of the artery, I use that all the time in my practice. For upper extremity problems and lower extremity problems. Visceral issues and that kind of thing.

Participant 1 detailed her approach to treatment:

So how do I incorporate the principle? It is always a constant concern. It is a continuous concern really, as I'm doing my history taking I'm looking for signs of: is this more mechanical, is this more arterial, is it circulatory related, is it more nervous related, is it more endocrine related, is it more autonomic related? I'm already doing the history taking and I'm trying to figure out OK the person is expressing a symptom, fine, with or without an official label and from there, hmm, what could go wrong in the structure governs function that could justify these symptoms; and involved in these symptoms are there circulatory issues and whatever that is CSF, arterial, venous, interstitial, lymphatic –that's always there because I'm trying to guess hmm through these symptoms what's occurring? The names don't mean that much to me I'm more thinking of what's leading, what's the cause behind that? And as I assess, of course I will assess the general systems, the general mechanism but if I did have a concern of any flow, circulatory problem then I can make it a point to observe whether it is occurring or not. So in my general assessment it is still there because does the structure have its integrity? It has to have a fulcrum and axis and so on and I have to have proper drive going through that, so it is still there in my assessment. Either in the general systems or in the specific assessment for a particular indication. In terms of treatment, well that's always in there (laughter), because the goal is always to restore some kind of basic structural integrity and after that it's all the quality of the integration and the dialogue and in the quality of the integration and the dialogue. Then comes the question about all our links that we mentioned before: are the fascial interrelationships ok, are the biomechanical functions capable of occurring ok, is the vasculature on, is the nervous segmenture on, and will that be able to integrate into the whole of the body of the person? So

> that's always there and in that, the fluid flow, or whatever those fluids are, are a part of it. … Is there something along the pathway that might lead to an entrapment like compression or separation, that's one route.
>
> On a totally different stand point, I will work versus the vasculature tree and the circulatory system. Whenever I'm working in the fields, particularly the morphogenic field using the circulatory system as a guiding development axis. … the embryological development, the vasculature tree development with the arterial branches bringing in the nourishment make like the driving forces, they make like lines of forces around which the embryo grew. And helped develop the various organs, the various limbs, because the upper and lower extremity develop around the vasculature axis that are the lines of forces that are provided by the nourishment that the embryo had access to at the time. And the arterial blood being more electrically charged. More electromagnetically charged because it has more nutrients inside, it does give off more of an organizational potential than the venous in the fields, …the CSF is electromagnetically charged as well because it has a particular consistency of proteins and ions and electrolytes that make it very electromagnetically charged. … Plus, because of the continuity between the CSF flow and lymphatic flow, it ensures a pumping cyclical motion being carried through the interstitial fluids as well, So we can think of immune defense, but also intra versus extra cellular matrix exchanges. That's just my opinion, anyway. So it is possible to work in the fields, in the developing embryo in the morphogenic fields to try to remodel and to use these lines of forces … from the vasculature to help remodel the fields and the forms of the person so they serve as guidelines so that is a totally different way of using the vasculature and "the role of the artery is absolute," but I think it is in parallel to the circulatory flow concern.

Incorporating the principle was also used as a guide in preparation of tissues. A couple of the participants identified that incorporating the principle as a means to facilitate palpation and success of other structural techniques was useful. Participant 7 and Participant 3 explain, respectively:

> For me now, the principle applies to all the different liquids in the body and I would use it now specifically when tissues would not react the way I would expect them to react. Example, I put … my hands on a certain area of the body and I want to do an induction test and I want to do an induction towards the normality for example, and I find that the tissues would not react in a way that they accept my suggestion and it's not because I'm not doing it correctly but there is some kind of reciprocity of the tissues ; then I would change into a more liquid approach and make sure that the blood circulation is free; to get the tissues to react better. Blood circulation and also the

> circulation of the other liquids which give it a better potential and a better softening of the tissue to allow me to put them more towards normality.
>
> It is very important to release the blood flow because, since 1903 with Dean Tasker, that the blood flow vitalize, gives stimulation for the glands in the body… it is very important for the endocranial work, any kind of work in the body, if the blood comes back in an area, after that it is easier to work. Reason, McConnell told something very important: more you bring back the blood in an area (the) easier it is to palpate, easier it is to test, easier it is to treat. It is for this reason, a lot of things, … the reason the role of the artery is absolute.

The AOA has used as their fourth principle one that explains the necessity to understand and integrate the first three principles (2005, p.1). Although the CEO/CCO have not adopted this as the fourth principle, participants voiced this notion of their own accord. P9 said:

> Whenever I think about the phrase "the role of the artery is absolute" it always brings me back to the four concepts of osteopathy and I always think about how they are interrelated to each other. And that it is an element of osteopathy, one of the key elements of osteopathy, … that it is a concept that stands on its own but it is also interlinked with the other principles, whenever I hear the phrase I recognize it within itself but also within its totality of the other principles and how they all work together to create the concepts of osteopathy.

Of the 30% who said they did not use the principle, a common theme surfaced (as expressed by Participant 6 and Participant 8) that they did not resonate with the word artery. For them, the PRM was a much greater tool in diagnostics and treatment since neither uses the artery as a means for osteopathic diagnosis. In fact, only one participant stated that they did use the artery as a primary means for diagnosis. P6 said:

> I think the thing that differentiates us more from the other professions is the role of cerebral spinal fluid but of course there is an inverse relationship between the venous system and the arterial flow and the CSF flow so I think, what my understanding of what we were taught at the CCO is, that the CSF flow, the PRM is primary, so to me that determines, that governs the other

> flows, … the PRM is … the breath of life.… when I do my diagnostics, I am diagnosing with the PRM, I believe I am, not with the artery. So, I don't use the arterial system as a diagnostic necessarily unless I am lead there.

Finding 2: An overwhelming majority (90%) of participants use indirect techniques and the majority (70%) assess and treat the fluids and liquids via the vascular tree, the tubing, or the flow.

The researcher sought to discover how osteopaths were treating the fluids and the liquids. Evidence from the data shows that osteopaths do so in a number of ways, both directly and indirectly. They also do not typically use a recipe for treatment or employ a set number of particular techniques. Instead, every person is treated individually and the methods of releasing flow are employed on an individual basis depending on the presenting symptoms and the palpation findings.

The ways osteopaths incorporate the concept of liquid and fluid treatment are complex. It also encompasses other guiding principles such as "structure governs function" and the concept of autoregulation.

The conceptualization of the structure of the vascular tree and the tubing with the flow of the liquids and fluids was identified as a means by which osteopaths treat. In the following passage, Participant 5 expressed the way she approaches the concept of fluid flow, structure and function, and treatment as it relates ultimately to the person in the following passage:

> It means that during my assessment or when treating somebody it's the thing I want to keep in mind when I'm assessing and treating. What is happening to that vascular tree. When I am doing a mechanical test I … think of the container and the contents and part of the contents is that vascular tree. What's the body doing, is it happy with it, is it in harmonious flow with it, … is it adapting to its needs? Is there something in dysfunction within the inner system of the vascular tree? So it means to me that it needs my awareness.

> Sometimes it needs direct attention. Is it the primary lesion, for lack of a better word right now. How is it doing in relation to the person whether I'm doing a mechanical test, palpation, assessments. What needs my attention when I'm both assessing and treating. … I'm thinking of the tree as much as the flow. So I'm thinking of it as having a structure to it instead of just fluids. So I'm not thinking of just in the fluids, … -the tubing itself (is) very important because if the tubing is in dysfunction then it can both mechanically alter blood flow but then there is also the tubing itself, (if it) is in dysfunction what is that doing to that (and) to the physiology of the blood cells. So, that's an area that I want to study a little bit more to understand and … the actual chemical changes within the blood that occurs when there are different mechanical stresses on the tubing. … I'm very much thinking, ok how is the tubing doing, and how is the flow within the tubing doing ? Which is all together like when you feel the tube you feel you think of the concept of both.

Finding 3: No participants felt that they learned how to treat the liquids and fluids in their undergraduate osteopathic studies. Over half of the participants learned primarily from a mentor postgrad.

As illustrated by the demographics data, the participants in the study all graduated from the CEO program before 2011. If more recent graduates were asked whether they felt that they learned how to treat the fluids and the liquids in their osteopathic undergraduate studies, they may have responded differently. However, whether the participants in the study learned how to treat the fluids and the liquids during their undergraduate experience has no bearing on whether they implement it in their current practice as illustrated in finding 1.

P7 recounts his journey towards understanding the principle via several mentors:

> Personally, I was introduced to the liquids, … including the blood flow itself, very late. So when I started to be a student there was this statement, "the role of the artery is absolute" but there was nothing more than that. So in my first five years of training I wasn't more introduced to (it than) that except (for) when you release a tissue tension; the vessels inside will be released so you will get a better blood flow, blood supply. So there were no notions of emotions, there was nothing about the other fluids and I wasn't even introduced to the protocol 2 approach. … So when coming out of the

> program, I remember the first time, like yesterday, introduced to the liquid approach by Denise Laberge. Denise Laberge who (was) working in Montreal in the student clinic and she introduced me (to) … the liquid work. At the same time, and she spoke of Bernard Darraillans being the one using it a lot. At the same time, I was in post grad studies and endocranial spasm courses (given by Philippe Druelle) and learned more (about) how to treat the liquid level.

Participant 8 mentioned that palpation skill level has to match what is being taught.

Finding 4: The majority (80%) of participants use the concept of the long Tide or biodynamics as an integration tool.

The key finding from the study was that Canadian osteopaths treat the fluids and the liquids. Finding 4 reveals that participants use fluid flow as an integration tool. Participants were asked whether they incorporate the principle at the integration phase, whether it be local, regional, or global integration. They were also asked when they felt as though they had finished a treatment. The participants did not clearly identify that they were specifically incorporating the principle at the integration stage but indicated that they were using techniques or modes of treatment from the fluids and fields.

Some participants viewed the concept of the long Tide as a part of the principle, "the role of the artery is absolute" and some did not. Participant 8, when asked how she knew her treatment had finished, answered "when the body was autonomous … the patient has fully re-inhabited that area and that they are autonomous within the functioning of that area." Participant 8 did not view a relationship between that concept and "the role of the artery is absolute."

Participant 8 explained the feeling he gets through palpation that indicates the treatment is done; he explains it as the feeling that life is back in the tissues. He says this is coming from the fluid and the flow.

Participant 5 identified a link between treatment of the fluids and liquids and how it releases into the ebb and flow of the Tide:

> Participant 5: when it (the artery) releases it is like a huge softening. It's like having a garden hose that is like a big thick rubbery garden hose that you are on and you can sort of sense that there is almost a stagnant flow of water … but when it releases it is like all of a sudden something happened to the tube itself and the tube becomes - like going from spaghetti firm to noodle-y and you feel this noodle-y thing happen and with this structure that you are on - and you have the sense of …softening in that noodle-y thing and with that you have this whole sense of the fluids within the body going through that now. So you have this noodle-y feeling but there is also this (whoosh) sometimes it is a slower process and sometimes it happens more subtly and it happens more of a slower ebb and flow that you feel from head to the toe after this gives – but sometimes it happens more quickly … so that release of fluids in that very confined area
>
> Interviewer: It almost puts you in P2 in the global fluids because it creates a whole flux and flow
>
> Participant 5: Yeah, and that's what you are looking for, that continuity with the fluid within this tube and the fluid with the rest of the body because it should be feeling like that everywhere.

Finding 5: The majority (70%) of participants believe the principle is grounded in Still's work and know the wording was changed but they are not sure by whom.

One of the research goals was to discover whether participants knew the historical lineage of the principle in question. The majority of participants knew that the principle was grounded in Still's traditional osteopathy and they knew that the wording had been changed from "rule" to "role." Many of the participants (40%) demonstrated more comprehensive knowledge of the lineage.

One participant (P1), in particular explains the early view of the phrase, "the rule of the artery" in the following quotation:

> … "the rule of the artery" has been interpreted in so many ways … some interpret "the rule of the artery" as very strictly as a physiological command saying that arterial blood flow was the main driver of the overall fluid drive of the body and that therefore CSF drive, or venous drive, or interstitial drive, etc., were secondary and then following that, that's where you have, even in the text from Still himself, the fact that the artery that's in command. Later he says it's the CSF that's in command. That's if you were considering that as if he was stating that … that there was like a hierarchy and that the arterial system had supremacy over the overall physiological drive but then over on top he had this overlapping helicopter view of the CSF … but that's an interpretation early on.

P1 continues to explain the reason for the change from the word "rule" used by A.T. Still and the word "role" used by the CEO:

> That's why when we use this as our guiding principle we changed "the rule of the artery is absolute" to "the role of the artery is absolute" but we're not the only ones, it was also changed in the American society at some point as well so it became "the role of the artery is absolute" because some people were saying that no you can't say physiologically that the arterial system is like a governing system that overdrives everything else from a neurophysiological standpoint, etc. so to avoid confusion "the role of the artery is absolute" meaning proper nourishment and overall fluid drive is necessary of course to maintain proper sustenance of the body.… So … between "the rule of the artery" and "the role of the artery" there is already a change in vision concept and for sure that would go along with Still's thinking "the role of the artery" because he is always talking about the withering fields, the necessity of nutrition and drainage, so that doesn't go against that, it just tried to avoid the controversy over the rule.…Even within there, "the role of the artery is absolute" then some would still use it very strictly meaning the thinking of the arterial system only or opening it up to any flow and flux … so here at the college we are interested into a holistic view of all the flows and flux.

Finding 6: Only a few (30%) participants clearly demonstrated their understanding of the principle to include all flows and fluctuations of fluids and liquids.

At face value, the wording of the principle, "the role of the artery is absolute" suggests that blood flow through the artery plays a key role in health. The correct and more encompassing interpretation of the principle is that all flows of body fluids need to move on time and in the correct quantity, otherwise tissue damage will result. (Druelle, 2005, p.6)

The quotation from Participant 1 in Finding 6 substantiates this. Participant 9 expressed their understanding as:

> For me it's all fluxes and flows, …the way I understand it, it speaks about all circulation, whether it be the venous, the arterial, the lymphatic, all fluid flow of the body. Not just to take it and identify the artery per say, …but that it is a recognition of all fluid flow in the body, so whether it be the arterial return in the venous system, the extracellular fluid that comes back in terms of the lymph, whether it be cerebral spinal fluid, it's really the fluid flow of all, and that fluid flow is very important to the health of the body.

Because only a few participants expressed a clear and correct interpretation of the principle, this begs the question, why not write or adopt a principle that does not speak specifically about blood? The key informant, Philippe Druelle, explains:

> If you have not the correct fluid flow, if you have not the correct blood flow the tissue lose the life progressively and lose the function and it is very evident … It is for this reason in our school we speak of the blood flow.

He further explains why the word "role" was used as opposed to "rule": " … the artery is so important. Because there are many functions, so it is the role." Again, Participant 1 explains in the quotation in Finding 6 that one understanding of Still's texts is that the blood was seen as a main fluid driver. Druelle readily admits that you cannot speak of blood flow on its own because:

> … it is a functional unit and this functional unit is the packet, in French, the packet of the systeme nerveuse … Because … all is inside the

> fascia. On the other hand it is possible to separate the blood flow and the fluid flow or the liquid flow. But sometimes I include the nerve and lymphatics and the vein at the same time. Like a global command of the mechanism. And on the other hand the blood nourish the nerve too.

Chapter 5 will highlight the link between incorrect interpretation of the principle and negative attitudes towards incorporating it in their treatment philosophy. If participants interpret the principle to mean the early view of "the rule of the artery is absolute," which considered the blood to be a or the main fluid driver, they were less likely to embrace the principle in their practice. If they understood the principle to be the correct meaning of "the role of the artery is absolute" which encompasses all fluids, liquids, and flows, they were more likely to incorporate the principle in their practice. One possible explanation is that it is the teaching or presentation of the principle and the tendency to teach in quotes as opposed to requiring students to read full texts that results in a disconnect from the principle and not the principle itself.

In the interview, participants were asked how they interpreted the principle, "the role of the artery is absolute." Forty percent of participants interpreted the principle as its traditional or original meaning. This is revealed in the following passage from P6, and P8's interviews respectively:

> I thought when it was handed to me, that it had actually come from Still. … So my understanding of the role of the artery is being absolute is very simple actually because if something doesn't have oxygen it dies.

> (The) principle of the role of the artery is absolute I see it as really the nourishment from the artery… I see it as the tissue needs to be nourished and well nourished by arterial/venous flow. Blood needs to come and go everywhere in order to nourish the fascia and drain the fascia.

One participant highlighted the possibility that by changing one word in a well-known phrase, it is not possible to remove the original meaning.

Finding 7: Only a couple (20%) of participants expressed that they liked the wording of the principle the way it is.

Participants were questioned how best to transmit the teaching of the liquids and fluids and whether they liked the wording of the principle. Quite a few (40%) of participants either felt that the principle's wording should be changed or expressed a degree of caution in regards to the wording. P2 said:

> I think we have to be careful as a profession to make sure that we say what we want to say and stop quoting what we think people from a hundred years ago were saying. Not that there is anything wrong with using a hundred year old statement as a source of reference, it's just that we tend to use those quotes, those small little snippets as what something somebody said … rather than the way they were meant or intended in the first place. … In support of it I will say … that I think that we are getting the gist of what he was trying to get at anyways despite the fact that this particular tenet – principle, was written so specifically I think we are still getting the gist of what he was trying to get at.

There was no clear majority finding in this category but some interesting attitudes surfaced. Two participants questioned why components such as PRM and palpation were not included in the principles. Participant 6 said:

> You can't really look at it (blood) as an isolated fluid or isolated system so I wouldn't call that in a way a rule or a principle, to me it is archaic, it's an archaic terminology we should be talking about the PRM is absolute I would say, the role of the PRM is absolute. Because, that to me, is the main driver because you have PRM even after death, even after the heart stops beating, PRM still exists for quite a while thereafter, so to me life is determined more, because we are looking at life, which is health which is lack of stasis which is mobility or motion if you are talking about fluids and those are driven by the PRM.

Finally, two participants noted that the principle relates more to a general concept of health, as opposed to osteopathy specifically; this suggests that that there is no uniquely defining feature that makes it osteopathic, and this was problematic for those participants. Participant 4 highlights her concerns in the following interview extract:

> I'm debating whether there should be principles because principles is going to make it easy, it is going to give them (students) guidelines, but they are going to stick to those and they are not going to look outside of those because that is the easy way. So when you read all of the articles on the values of the principles of osteopathy you will see guys argue on both sides, and I like both sides …but I wouldn't use those four principles. …so what makes osteopathy osteopathy? What makes osteopathy different, and does it have to be different, because you will see people argue whether we need these principles to be distinct. What makes us distinct, a surgeon has the same thing, the rule of the artery is absolute. Does that make us distinct? Does structure governs function make us distinct? No. Autoregulation belongs to the body it doesn't belong to us. Structure governs function, they are interrelated, structure and function are interrelated. What makes us distinct, do we need to be distinct, what we are not talking about is palpation. That's what we do better than anyone. That's what we think we do, we don't teach palpation despite the fact that we think we do. Do we? … Do you get taught how your hands transmit information from your mind; can your mind process it? … So when we talk about those principles, are they principles of what. Are they principles of healing, are they principles guiding what the osteopath does?

Finding 8: Many (40%) participants either felt that techniques to treat fluids and liquids need to be improved or that the teaching of the principles needs to be improved at the undergraduate level.

Given that one of the goals of this study is to provide a platform for discussion on future curriculum development, one of the areas of discussion in the interview was to determine how participants felt about the present curriculum and teaching of the principle and fluids or liquids. Again, no majority arose here in the data but participants offered reflections and suggestions that might promote curriculum debate.

A breakdown of the data shows that 40% of participants expressed the need for improved teaching of the principles in general. Forty percent of participants indicated that they felt that liquid or fluid-related techniques and palpation need to be improved. Twenty percent thought that the concept as expressed in the principle, "the role of the artery is absolute" should be introduced in the first year of study. A couple of participants made a suggestion that palpation skills need to match the level of curriculum being taught.

Finding 9: Participants did not feel like they actively applied the principle in cases of pathology. Participants did find that for certain pathophysiological states there was a direct relationship between outcome success with liquid and fluid flow treatment.

Participants stated that they do not apply the principle to pathologies because each patient is unique and they felt that they work in the fluids and liquids on most patients. When asked if they applied the principle to specific pathologies P2 answered, "I would say no, and the reason why I'm going to say no is that I use it with everyone. So I don't think there is a pathology where I would focus more on arterial treatment." P6 echoed this statement:

> Again I don't look at it in those terms, you know because it may not appear as that so I don't really prejudge any pathology or any presentation or anything because it doesn't make sense osteopathically so ya, that would be no.

Upon reflection, participants did identify some physiological states or pathological states where using techniques to facilitate liquid and fluid movement and flow had good results. These were typically in concussed patients and in patients with symptoms such as congestion, oedema, pain, and numbness and tingling in the

extremities. These groupings of symptoms were common in patients with thoracic outlet syndrome, complex regional pain syndrome, and compartment syndrome.

In cases of concussed patients, the key informant (Participant 3) said:

> It is evident …for the concussion, I find for the hockey player NHL and cerebral palsy I feel exactly the same, it is the compression of the petrous canal. Compression of the petrous canal and you have a compression of the petrous canal and compression or stretch of the carotid and sometimes you have not enough tension for the syphon carotidien. Then you have (a) problem for the syphon carotidien. And the syphon carotidien is so important because it relieves the pressure in the smooth arteries in the brain. Alors, if you have a concussion maybe you have a direct shock or maybe it is possible to have an indirect problem you have a tension of the compressive activity inside the petrous canal or the syphon carotidien because a lack of vascularisation, a lack of pressure inside the brain for the blood flow. Another example, the babies with the cerebral palsy is the same.

P1 also indicated that she addressed the liquids and fluids specifically in patients with concussion:

> If I clear the Willis circle I have much better results in terms of the headaches of my concussed patients. That's like one of the key things; you have to work the concussion itself eventually but in the early stages, whatever I do, I can clear the Willis circle and its initial branches the anterior, middle and posterior artery, that greatly decreases the amount of pain the patient has, because the patients have the most pain in the initial month, some will dissipate after ten days, some will pursue and continue, but if you can get the Willis circle going: much decreased pain.

P1 continues and explains how freeing the pathway for fluid flow by removing obstacles is key to healthy function, especially in cases where the flow is congested or impeded, as in thoracic outlet syndrome, complex regional pain syndrome, and compartment syndrome:

> Same if I can clear the thoracic outlet, great great impact on patients who have complex regional pain syndrome. Again, that means whatever that implies, free up that area, the trajectory of that pathway and the CRPS doesn't need to exist. The thoracic outlet for me involves the nervous segmentation

> levels of the upper T's, lower C's and the cord. Because that's the reflex sympathetic pathway. Yes, because the vasomotor function to the upper extremity comes from the upper segments of the T-spine and the cord. The thoracic outlet, that's nice to think of the scalenes and the clavicle and the pectoralis, that's fine, but it's the whole area of the scapular junction involving the upper Ts and the rest of the surroundings with the ribs and the cage and the inner organs related to it so that's why, clear whatever is necessary to clear that thoracic outlet … or simple parasthesia. Diffused parasthesia that is related to circulatory issues. You could write the same in terms of the lower extremity; compartment syndrome, compartment syndrome is like the equivalent to that in the lower extremity.
>
> Also in patients with Gut-brain syndromes with leaky guts and autoimmune effects throughout the body (with or without parasites and microbiome disregulation), you cannot get good results if you do not figure out what is impeded proper flow in, around and out of the digestive tract and associated structures.

4.4. Conclusion

The results from the demographics data and interview data demonstrate some interesting relationships between what participants do and how they conceptualize what they do. They treat the liquids and fluids but they do not all conceptualize it the same way and they do not relate their work to the principles in the same way. The current position each unique participant inhabits on their osteopathic journey also may influence their responses to the questions asked in the interviews. Participants expressed that they were still discovering ways to conceptualize the body and health in relationship with our environment.

Although the results do show some discrepancy in the interpretation and use of the principle, a greater result is suggestive of the nature of principles. “The role of the artery is absolute” is not necessarily vague because there are different interpretations. Instead, perhaps, the principle meets the osteopath where they are on their journey. This signifies one potential aspect of principles, that they be attainable at every level but not limiting.

The results portray a thoughtful and insightful group of osteopaths who are continuing to make discoveries in their clinics everyday. They are continually making links between what they feel in their hands and the theory that they have learned. They are a group that seeks answers to questions but trust and value their palpation and the greater knowledge the body holds and what nature presents to them – just as A.T. Still did before them.

5. ANALYSIS

5.1. Introduction

The purpose of this grounded theory study was to explore whether expert Canadian osteopathic manual practitioners are incorporating the principle "the role of the artery is absolute" in their practice. The researcher aspired to learn and share experts' opinions and perceptions of the principle and its role in the practice of osteopathy in order to foster debate surrounding osteopathic principles and their content and purpose for practitioners, teachers, and learners.

The data collection methods in this study included a demographics data sheet and in-depth interviews triangulated with a literature review. The researcher interviewed 10 experts in the field of osteopathy who are or were affiliated with the CEO in some way. Data was coded and categories emerged from the data. The categories were not, therefore, limited to the research questions but arose from the content of the interviews. The study was based on the following research questions:

A. What are Canadian osteopaths' understanding of the history of the principle, "the role of the artery is absolute" and what are their perceptions of this principle?

B. Based on their understanding of the principle as well as their education and experience, how do Canadian osteopaths incorporate this principle in their practice?

C. How does this principle factor in terms of their methodology? Meaning how does it emerge throughout the process of health intake, observation,

diagnostics, palpation and testing, and approach to treatment and integration.

D. Are there detailed accounts of employing this principle that would potentially lead to quantitative research?

E. Based on their feelings and perceptions of this principle, how do osteopaths view its future inclusion as a guiding principle?

Relevant literature was reviewed and included in the analysis. The theory developed in the analysis is a result of constant comparison of categories and themes. The analysis strove to weave together categories arising from the data with the topics from the relevant literature. The purpose of this chapter is to provide a global understanding of the issues at hand. The discussion will include the literature surveyed in chapter two with the hopes of augmenting the understanding of how and why Canadian osteopaths are treating the liquids and fluids of the body and how it relates to osteopathic principles, learning, and the future of osteopathy.

5.2. Theory Development

The process of theory development is grounded in the data and emergent from the constructed categories and themes. The findings from the previous chapter will serve as the basis for the theories articulated in this discussion. The findings were presented as a deconstruction of the interviews and demographics, whereas analysis seeks to incorporate the findings with the literature review through a study of themes and patterns. An umbrella theory provides additional framework to the three theories presented in this section. Following is a discussion of the umbrella theory.

5.2.1. Viewing traditional osteopathy on the landscape of healthcare

Traditional osteopathy, at the postgraduate level, lends itself to case study outcome-based studies as opposed to evidence-based clinical trial studies. There have been attempts made to join the landscape of healthcare by seeking external validity and to preserve the traditional osteopathy simultaneously. This has proven challenging for many osteopathic communities. The practice of traditional osteopathy does not prescribe set treatments for symptom pictures; rather, it views every person as unique. The job of the osteopath is to remove obstacles and allow fluid to flow in order for the body to heal itself.

In traditional osteopathy, freeing fluid flow is a primary aim in treatment outcomes. As participant 10 reminded us, "Still said…, 'tell me the moment that circulation was inhibited and I will tell you the exact moment that the disease process started.'" Any structure, whether corporeal or emotional, is addressed in assessment and treatment if it interrupts normal fluid flow. The more easily measured components of treatment are within the tissue structure. Therefore, the complete breadth of the traditional osteopathy that includes fluid flow does not easily fit into the box of today's evidence-based healthcare model.

The traditional osteopathy practiced at the CEO includes the motion of the fluids, which is inherently difficult to measure. Traditional osteopathy is distinguished from other manual practices and is, in part, due to palpation and the inclusion of the work of the fluid body. This type of osteopathic work does not lend itself to gold standard randomized clinical trial studies because it is not reproducible.

Even so, one of the goals of this research study was to ascertain whether any patterns might emerge that would lead to a quantitative research study. The participants were asked if they apply this principle toward any pathology or target group. There were very few instances where this was the case and the general outcome from interview finding 9 was that this

method of thinking was non-osteopathic. The principle was applied to all patients, some more than others, all depending on their unique symptom picture. What did emerge was that in some pathophysiological states where congestion, oedema, paresthesis, and further resultant symptoms of neurovascular compression arose patients did respond to fluid and liquid work. Further, when vitality was low or the tissue was difficult to palpate, mobilizing fluids and liquids resulted in better palpation thereby improving other tissue treatment. This is consistent with McConnell's teaching.

The symptoms pictures that responded favourably to fluid treatment were concussion or post-concussion syndrome and thoracic outlet syndrome. Other conditions similar to thoracic outlet syndrome were also said to respond to fluid treatment. Generally, these symptom pictures result from neurovascular or vascular bundle compression by some other structure. Although post-concussion syndrome is currently under the medical microscope, research is still in early stages. This may be an area of opportunity for osteopathic quantitative research. Regardless, the treatment remains indirect and therefore it is difficult to establish which elements of treatment resulted in specific flow increases

This study examines the uniqueness of the fluid body element in traditional osteopathy, the inclusion of the principle, "the role of the artery is absolute," and an analysis of how we learn to work with the fluid body.

5.2.2. Theory 1: Traditional osteopathy includes treatment of the fluid body and this distinguishes it as a unique medical practice.

This first theory speaks to findings 1, 2, 4, and 9. Finding 1 describes participants treating the liquids and fluids and incorporating the principle, finding 2 describes participants using indirect and more direct techniques to address the liquids and fluids, finding 4 describes

participants using the long Tide or biodynamics as integration tools, and finding 9 describes the incorporation of the fluid or liquids in successful treatment of certain pathophysiological states. These findings speak to how the participants identify with a practice of osteopathy that reflects their treatment approach and subsequent outcomes.

Not all colleges teach the traditional osteopathy and not all colleges or osteopaths may define traditional osteopathy in the same way. On an individual level, not all osteopaths embrace Still's early work. The CEO states that its intent is to teach the traditional osteopathy as originally founded by Still and further developed by a lineage of osteopaths who keep the practice distinct (Druelle, 2009; Jealous, 2015; Thompson, Petty & Moore, 2014).

Some of the defining characteristics of traditional osteopathy appear to be the use of the primary respiratory mechanism as a diagnostic and treatment tool, finding the cause as opposed to addressing symptoms in isolation, the use of palpation as a primary tool for diagnostics and treatment, and employing, as a goal, the concept that by removing obstacles to fluid and liquids flow, the person is able to receive the necessary nourishment and drainage they need to act as a functional unit so that dynamic autoregulation may take place. The treatment of liquids and fluids via the use of a unique palpation appears to distinguish it from the greater field of osteopathy (Becker, 1997, 2000; CEO, 2012; Cotton, 2013; Frymann, 1976; Paulus, 2013; Rogers, 2005; Still, 1899, 1902/2012, 1908, 1910/1992; Thompson, Petty & Moore, 2014).

The principle, "the role of the artery is absolute" holds many layers. It acts as both a principle unto itself and a unifying concept that links the other three principles. At its most basic level it refers to Still's concept that the arterial blood provides the necessary nourishment and oxygen for tissue health and repair and drives other essential fluids to bring health and vitality to the patient. McConnell also wrote that this normalized flow results in improved

palpation and this was substantiated in the data. The principle further acknowledges, by the change in wording from "rule" to "role," that osteopathic science no longer sees arterial blood as the main fluid driver but that all fluids work in dynamic tandem; each fluid has an essential role to play. From an examination of the literature and from listening to the participants in this study, it was revealed that the principle has further layers. The goal of treatment is often cited as finding the cause of whatever is holding the patient back from expressing their inherent health. The goal, once the cause has been found, is to remove the obstacles by aligning the structure so that "nature can do the rest": the system of fluids and liquids can move resources and remove waste. This concept uses direct treatment of the structure or direct treatment of the tubing of the neurovascular system to achieve a result within the fluids and liquids, and indirect treatment of the actual liquids and fluids. Finally, the principle incorporates the movement of the tides and flows. It is through the provision of the fulcrum between patient and osteopath that the potency from within the stillness of the fulcrum may be unleashed and the flow of the long Tide of change may bring integration to the person. This integration includes integration of treatment with the patient, directly addressing the person and not just the body or tissue, and sparking the system of autoregulation. This was expressed in several ways by the participants. In the words of Participant 8, it is the feeling of having "the quality of tissues back in my hands…when I've got the suppleness I would say, the resilience back in the tissue."

Understanding the principle and embracing its wording is key to embracing it as a guiding principle. The participants in the study did not all incorporate the principle in their practice but they overwhelmingly depicted a community that embraces and treats using the traditional osteopathy.

A key component of treating liquids and fluids which further makes the traditional osteopathy unique is the additional palpation style; this was identified as protocol 2. Participant 2 defined it as, "the movement of liquids and the palpation of those liquids inside of the body." The participants who talked about treating the fluids and liquids identified a palpation that was receptive and volumetric. Some found that the liquid or fluid lesion must come to the practitioner. Previously, it was discussed that the osteopath must find the cause but if the problem is within the fluids, it will present itself when it needs to be addressed and in the correct order. Participant 8 explains the feeling of this phenomenon:

> Interviewer. So do you feel like you work the vascular tree?
> P8. I know I have touched it. Have I worked it? Is that on a voluntary basis? I know I have touched it, I know I have felt it and (it) was always coming in my hands and not be going there. So it's not a control treatment.
> …I'm saying I have used it, …, it wasn't voluntary. That's the entry door the body gave me. So basically you are going through release, I have my hands on a region, …, I go through the release and after that release, when you say when do you know it is over, well I had my release but it's not over, I still feel something. Normally that's where that arterial tree will show itself to me. So it's not something I wanted to get, it's something that comes and gets me. I'll use it, I will normalize it but to start with I can't say I will go and work the vascular tree.

The idea of the body or the patient as physician is demonstrated in this respect for emergent treatment order and likewise for approach to treatment or methodology. There can be no blueprint of treatment instructions because when the osteopath searches for the cause, they must also ask why the body or person is presenting their symptoms. Participant 5 shares a perspective:

> So, one way I look at it is, say you have a second degree, yes you have forces and traumas that are there but what is keeping it there? So you get to the molecular level, or what is it that is holding it there. Why is the body holding it …, is it trying to protect something. Often times it will hold on to something it is trying to protect and I see that one of the strongest things that the body is trying to protect is the vasculature pathways. It is the most vulnerable, the body will lock down a joint to protect its blood flow. So ok, I say what can I do in that kind of situation to alleviate what the body is holding on to. So I take it from that aspect, so when I see

> a shear or a second degree, I ask why is the body doing that, instead of trying to correct that. I want to get at why the body is holding onto that because if you look at the joint itself it has the capacity to be in ideal alignment or not. Why is being held out and this idea of it being stuck. Well, the body always has choices.
> …Right, so with treating I see a lot of underlying in nature, which is arterial in nature, which the body is correcting and is sustaining a lock down. And so it is a matter of addressing the lock down and when, so I see the rule of the artery as being so much higher than the container, second degrees, the shears anything like that because keep asking why, why, why, why and you get down to …you often get down to the most vulnerable component which is the artery.

Many of the participants stated that they used embryology as a guiding factor in conceptualizing their approach to treatment. This is part of the epistemology of traditional osteopathy. Further, this coincides with the teaching that the patient is the physician or that the body will reveal to the osteopath what to treat and in what order. Participants 2 and 1 explain the link between the principle, "the role of the artery is absolute" with embryology and demonstrate the numerous concepts embodied in the principle:

> The artery is not an anatomical structure to Dr. Still - it's a pathway it's like a region or an area, the most important area embryologically; all the tissue in your body develops around the artery, the artery is the axis for growth, so the artery itself grows along with a nerve but never grows by itself. So the nerve and the artery are growing together inside of embryological development and the bones and muscles are forming around the artery. So we have this funny saying that in anatomy that an artery goes through a bone and a nerve goes through a bone but the actual truth is that the artery and nerve were there first and the bone grew around them. So there are no foramens in bones, there are arteries and nerves with bone around them. (Participant 2)

> The growth of the embryo follows the growth of the vasculature system because it needs to be nourished as it grows. And that process, makes the arterial system along with the nervous segmentation that goes with it, and the venous system, the primary sources are from the incoming nourishment.
> …So it is possible to work in the fields, in the developing embryo in the morphogenic fields to try to remodel and to use these lines of forces to – from the vasculature, to help remodel the fields and the forms of the person so they serve as guidelines. So that is a totally different way of using the vasculature and "the role of the artery is absolute," but I think it is in parallel to the circulatory flow concern. (Participant 1)

Practicing traditional osteopathy is distinct from other more structurally-oriented osteopathy because the aim of treatment is to free fluid and liquid pathways so that the body may be nourished and its inherent mechanisms of dynamic homeostasis can be vitalized. It is also distinct in its quest to treat the person and not just the tissue. These components are enacted through the teachings encompassed in the principle, "the role of the artery is absolute."

5.2.3. Theory 2: The meaning of the principle, the role of the artery is absolute, distinguishes traditional osteopathy from other manual therapies

The current literature surrounding osteopathic principles discusses their role and content. There has been a call for osteopathic principles to be more specific and more descriptive of what osteopaths actually do. The inclusion of the principle, "the role of the artery is absolute," identifies that traditional osteopaths view fluid drive and fluid potency as a field of work unto itself. Working with the fluid body requires a particular palpation quality that differs from palpation of the structural body and the fascial body. This theory was developed from findings 1, 7, and 8. Finding 1 notes that the majority of participants do incorporate the principle in treatment and finding 7 describes a desire to change the wording of the principle. The data shows that the more participants understand the principle the more likely they are to feel positively towards it, and finding 8 shows that many participants value the teachings of liquids and fluids and/or the principle and would like to see improvement in how it is taught at the undergraduate level.

The majority of participants said that they incorporate the principle, "the role of the artery is absolute" in their practice. This demonstrates the value of osteopathic guiding principles not just as a learning and teaching tool but at the level of application as well. The principle, when understood and applied as intended, distinguishes the traditional osteopathy

taught at the CEO. The debate as to whether the wording should be grounded in Still's writing remains. Cotton and Paulus would agree that the principles should be grounded in Still's writing, otherwise the tendency is to form vaguely worded principles that do not distinguish osteopathy from other manual practices (Cotton, 2013; Paulus, 2013). On the other hand, the data showed that an overwhelming majority of participants apply the concepts embodied within the principle even if they refute it due to its wording. This speaks to a community and culture of life-long learning grounded in the foundations of osteopathy, even if specific principles are not consciously or deliberately followed.

Therefore, the most valid argument for the use and value of principles is as teaching and learning tools and to provide external validation. Participants demonstrated that if they felt positively towards the principle at hand, they embraced it and applied it. When they did not understand it or if they were not able to actively apply it, they felt negatively toward it and discarded it as a guiding tool. These findings should spark conversation regarding the wording. One possibility is a reframing of the same principle using more current phraseology so that it is still grounded in Still's teachings but does not use the same wording. This would satisfy the need to remain grounded in the foundations of osteopathy while still speaking to the contemporary student. Unfortunately, this might remove the layered complexity. The invitation to investigate the squirrel in the hole of the tree should not be cast aside for this is where the potency lies and ultimately this is where Still, Sutherland and many others have sought the answers to osteopathy.

The concepts embedded in this principle are applied differently from those of the other principles, which are more directly incorporated into treatment. For example, adjusting the alignment of a structure to improve function easily and simply satisfies the application of "structure governs function." It is also easily grasped that the fascial system responds as a

functional unit. An argument for simplicity is attractive, as students may seek a more direct and easily attainable comprehension and it may help with external validity. However, osteopathy relies on a complex framework of ideas. "The role of the artery is absolute" embodies the concept of unique palpation, wholeness, and movement. These remain key concepts that need to expressed through the principles.

In the debate surrounding external validity, the principles have been charged with the task of making osteopathy distinct from allopathic medicine and other manual practices. The osteopathy taught and practiced in the United States may seem to enjoy a more secure place in the medical landscape of healthcare than does osteopathy in Canada. However, it does not appear that this would be the case if the traditional osteopathy were being practiced, as it does not lend itself to standardization. Perhaps trying to distinguish osteopathy using principles alone is too great a task. Outlining ethics, approaches to treatment and patient care, epistemology, and methodology may fill the void to distinguish osteopathy from other disciplines. This approach was certainly taken by the BSO and the AOA. In the least, osteopathic principles should help guide clinical decision making and be descriptive of the basic tenets of the profession. In their presentation at the 2014 OIA conference on establishing the first university program in osteopathy in Quebec, Andree Aubin and Chantal Morin outlined the importance of reviewing principles. They cited Stephen Tyreman's writing on the need for osteopathic principles to distinguish osteopathy from other healthcare practices. Tyreman explains that the principles are open to a range of interpretations because the wording is not precise and they do not say *how* osteopaths do what they do. Additionally, the principles do not mention palpation and motion, which Tyreman (2013) says are core elements in osteopathy (p. 42).

The principle this study examines does not mention palpation in the wording. However, the principle does address the element of motion. The blood must flow on time and deliver the correct quantity for normal function. Tyreman (2013) warns that principles that are not worded precisely risk being interpreted in different ways (p. 41-42). This study validates this concern, as only 30% of the participants accurately detailed the principle's meaning as intended by the CEO. The CEO took the meaning from the statement by Still (1908), that "The rule of the artery is absolute, universal, and it must be unobstructed, or disease will result" (p. 180), then applied it to all fluids and liquids, which is signified in the change of wording from rule to role. The researcher is not disputing that this was not also Still's intent; in fact, the literature demonstrates that finding a hierarchy of fluid drivers is challenging. Rather, upon examination of the breadth of Still's work, determining that he did believe that all fluids need to flow on time and in quantity sufficient, or disease results, is the conclusion with the most evidence. The confusion arises when using a partial quote. This is in some contradiction to Paulus, who suggested that using principles grounded in Still's writing may prevent them from sounding vague. Forty percent of participants demonstrated an understanding of the principle from Still's teaching in the quote above that the arterial blood was a main fluid driver and that from this fluid drive the body would be properly nourished and wastes removed which would ward off disease. They took the literal meaning from one statement from Still regardless of the change in wording from rule to role. This does not, however, demonstrate that those 40% do not understand the breadth of Still's teaching. Many participants demonstrated that they do have a strong grasp of his teachings but the wording of the principle resulted in confusion. This signifies that Tyreman's concerns are valid: wording matters as much as the intended meaning.

Hoover would agree that wording matters. In his article "A Hopeful Road Ahead for Osteopathy," Hoover (1963) encourages the osteopathic community to develop a language to properly describe the profession as this would prevent its members from feeling that they are practicing an illusory discipline as opposed to a realistic one (p. 32). He demonstrates that if the osteopath can effectively use functional language to describe what he is doing, he will succeed in accurately interpreting the data he is gathering in palpation and treatment and then be able to develop the necessary skills.

The implied meaning of the principle indeed distinguishes traditional osteopathy but it is necessary to push further to develop a language that tangibly describes what is happening conceptually when treating the fluids. Then it can be said that the principle itself distinguishes traditional osteopathy from other manual practices.

5.2.4. Theory 3: Recognizing how we learn to treat the fluid body in traditional osteopathy is different from structure

One of the goals of this project was to provide some research to fuel curriculum content and debate. The third theory, based on findings 3, 7, and 8, examines how we learn traditional osteopathy. Finding 3 describes a layered and varied learning journey where participants mainly learned to treat the fluids and liquids from a mentor, finding 7 describes a voiced caution or change to the wording of the principle, and finding 8 describes a desire to improve teaching of the principle and/or teaching of fluids and liquids at the undergraduate level. The way some of the participants conceptualized their personal practice of osteopathy changed over time and was related to their interactions with the osteopathic community, mentorship, and clinical experience.

Although there have been changes to the curriculum since the time the participants in the study went through their undergraduate experience, the treatment of the liquids and fluids remains challenging and elusive for some students. The layers encompassed in the principle, "the role of the artery is absolute" did not reveal themselves to the participants in the study until after they had graduated from their undergraduate program. However, as P7 noted, the full concept of "the role of the artery is absolute" is now being taught at the college.

Although many of the participants voiced the need for improved teaching and palpation of the fluid and liquids, only a couple of participants said that this should occur at the beginning of the program. In osteopathy, learning is three-fold; not only do students need to learn anatomy, physiology, methodology, and techniques but also palpation and should, additionally, experience the value of the unique osteopath/patient interaction. Still wrote about the necessity of knowing many cases of normal anatomy and physiology in order to recognize the abnormal. Learning to treat in the fluid body is yet another level of palpation and has its own methodology of treatment that differs from other tissues.

The teachings embodied in the principle, "the role of the artery is absolute" are particularly difficult to master due to the nature of fluids and liquids. As previously indicated, the palpation required is volumetric and there is a quality of wholeness in palpation in the fluid body field. A quality of passive palpation with active attention is needed when working with the Tide. This is a different palpation concept than sinking to the level of a tissue. Jealous (2015) suggests this level of palpation alone limits the amount of healing possible because the osteopath, as a kind of observer, must also be receptive as opposed to active. Finally, great awareness and focus are skills required to effectively use the potency within the stillness of the fulcrum and work within the fields. Before they can be taught and mastered, students need a competency in the basics of osteopathy.

Recognizing that students do not each palpate every tissue and liquid or fluid equally is essential. Also, acknowledging that students do not master every mechanism at the same rate is also important in respecting the unique and personal journey in becoming an osteopath. Further, the nature of learning palpation in the fluid body must be experienced before it is validated. Participant 8 speaks to the nature of learning osteopathy:

> …there is so many ways in osteo. You need, as a student, to find your way. You need to find your entry door in the journey of osteo. As a student I wanted to be good in all the approaches. As I gained experience, I realized that you got to dig in and play with an approach for at least five years to know what you are talking about. And there is hundreds of approaches in osteo. But the good thing is that I realized, no matter what entry door you took, once you are in the system it's an inverted pyramid where the body will show you and show you. So no matter by where you enter, at one point you will have access to everything anyway. So, if someone got the natural feeling of blood flow then they might go and say I got that as an undergraduate. But baseline I do believe in what we teach. Structure first. … Keep it simple. And every time we set a new fulcrum, a good reference point, you allow the body to go back in normality, no matter what was your aim in your head, the body will use you to go where it needs to be. So better to do simple things well then try to go very deep but do nothing. …So up until you have your library of feeling of what does the body show you. Keep with what you do know. …as undergraduate first you need to do it, do it, do it, before you start knowing what you are doing. I now know for sure and I had people when I was a student in my class that like to go faster than their pace and they would go in there and work with people with experience and ask questions and I always remember them coming to Philippe and say to Philippe, I heard about this and what is it? and Philippe's answer was, 'once you will feel it then ask me again and I will tell you,' because it is if you hear a concept but you have no clue what it is, your brain will kind of build it in your hands and you will go, oh that is what they meant, if you don't know about a concept and it comes to you then it is real, then you haven't made it up, it's there now you can start learning about it and play with it. So in osteo there is a lot that you need to have the experience to go and get but with that experience some people it's the structure, some people it's the fluid, we all have different natural feelings but you need to build up your library.

The principle, "the role of the artery is absolute," at a basic level, is a fundamental concept in health and must be understood by the student. Participant 10 suggested that the principle be reframed as "the role of the vascular tree and neurological grid is absolute…and we need to include the role of respiration." Certainly, this would be more attainable and

therefore meaningful at the undergraduate level. However, there are multiple layers that would be excluded with this change in wording. Further themes embodied in the principle become a kind of invitation. Not all osteopaths may accept the invitation into less easily measureable fluidic concepts, but all of the participants in the study are on the journey of doing so, which speaks to its success. All the participants learned ways to work within the fluid and liquid fields in their postgraduate work, which speaks to its strength, even if only measureable by outcomes.

A review of the wording of the principle was suggested by some participants, as illustrated above. The principles serve as guidance in learning, teaching, and curriculum building. Principles help to shape methodology, and they help to explain why and how we do what we do. The clarity of the meaning of the principle is important, as some participants indicated. However, the principles can also have layers of meaning which in concept may appear simple but in application are quite complex. Participant 2 expressed caution with the wording because it is a partial quotation from Still. Using partial quotations without understanding and embracing the larger picture results in a dangerous dismissal of its complexity. Participant 4 expressed concern that students want something simple to hang on to. For the curious student, however, the principle becomes an invitation to explore a world beyond the basic teachings. Therefore, it becomes a question of culture of learning: what is the culture of learning the traditional osteopathy?

6. CONCLUSION

The purpose of this grounded theory study was to explore how expert Canadian osteopaths are incorporating the principle, "the role of the artery is absolute" in their practice. The conclusions from this study are grounded in the findings and address three main areas: a) Participants incorporate the fluid body in their practice and this makes their work distinct in the field of osteopathy and healthcare; b) The principle, "the role of the artery is absolute," makes the practice distinct in the field of osteopathy and healthcare; and c) Learning to treat the fluid body is a unique area of work and incorporating the principle is a multi-layered process. These three main areas of interest fall under the larger umbrella of the current need for osteopathy to seek external validation and the attempt to create the first university program in osteopathy is Canada. Following is a discussion of the current role osteopathy plays on the landscape of healthcare in Canada. The discussion includes the major findings and conclusions drawn from the research as well as the researcher's recommendations and final reflections. Appendix 12 contains the matrix demonstrating the researcher's pathway from the research questions and findings, through interpretations, conclusions, and recommendations.

6.1. Discussion of Findings and Conclusions

The conclusions are drawn from the theories generated from the research questions and data.

6.1.1. Working with the fluid body distinguishes traditional osteopathy

Participants incorporate the fluid body in their practice and this makes their work distinct in the fields of osteopathy and healthcare. The major finding in this study was that an overwhelming majority of expert Canadian osteopaths work with the fluids and liquids in treatment. A conclusion to be drawn from this finding is that, in the shifting field of osteopathy, expert Canadian osteopaths are practicing a unique and distinct manual practice termed "traditional osteopathy" by the CEO. In today's landscape of healthcare, there is both a desire for traditional osteopathy to remain true to all the components that make it so while simultaneously seeking external validation and entrance into the halls of academia. The participants in the study demonstrate that they are incorporating A.T. Still's teaching that all fluids in the body must flow on time and in the correct quantity to nourish tissues and remove wastes. In doing so, immunity will be optimized, pressure balances will be ensured, and vitality can emerge to aid in functional unity and autoregulation. The challenge exists in measuring changes in fluid flow as all treatment is in essence indirect. Studies involving fluid flow may, in large part, be outcome-based. Other osteopathic communities have tried to alter their practice in order to fit in to evidence-based medicine, but these pathways are not without the potential for problems. The pressure to validate purely through empirical clinical trial studies is great and if traditional osteopathy is to survive, due attention must be paid to other areas which help to validate outcome-based studies, such as principles, epistemology, approaches to patient care, methodology, ethics, and standards of treatment. These elements will help to explain what we do and how and why we do it.

6.1.2. "The role of the artery is absolute" makes traditional osteopathy distinct

The principle, "the role of the artery is absolute," makes the practice of traditional osteopathy distinct in the field of osteopathy and healthcare. Principles help define the field of osteopathy generally. The inclusion of the principle, "the role of the artery is absolute," defines traditional osteopathy on several levels. First, it identifies the main goal of treatment, which is to align tissue, thereby removing any obstacle that may obstruct fluid flow. Second, it speaks to the wholeness of the person. Again, it supplies a treatment aim which is to ultimately treat the person and not just the body or a sum of parts. It addresses the wholeness of the person because it is through the fluids that we access the full person in relationship with their natural surroundings. Third, it embodies the concepts of motion and palpation which are key concepts in osteopathy.

As life-long learners, traditional osteopaths value guiding principles but evidently principles are not the only factor in professional development. Although not many participants identified with the wording of the principle, this did not influence the outcome that an overwhelming majority of participants apply the concepts embodied in the principle. Other factors, such as post-graduate courses, mentorship, knowledge of traditional osteopathic teachings, community, and self motivation to life-long learning result in a group of osteopathic manual practitioners who treat with skills well beyond the undergraduate level.

The participants value the principles, and this sentiment is largely reflected in the literature. The role principles play in learning and in distinguishing the profession were identified as key to the continued existence of traditional osteopathy. From the literature, as well as the data in this study, the concern that has been expressed is that the principles

do not clearly explain what we do and how we do it. Repeatedly, the principles have been accused of sounding vague or too much like other manual practices. Discussion regarding whether they should reflect current research and avoid using archaic phraseology has also arisen. Given the precarious place osteopathy holds in the landscape of healthcare, more attention needs to be placed on principles, approaches to treatment and patient care, epistemology, standards of practice, curriculum, and ethics.

Although it distinguishes traditional osteopathy, the wording of the principle, "the role of the artery is absolute," is troublesome because the data shows that it is not being wholly embraced. It may be the original teaching of the principle that is the fault at hand. Because no participant was taught the fluid body in their undergraduate practice, their experience may differ from those students being taught today. Regardless, the finding demonstrating a relatively low current understanding or acceptance of the intended meaning of the principle is of value.

The findings showed that there was a correlation between understanding the intended meaning and acceptance of the principle. Therefore, a conclusion can be drawn that with better teaching of this principle, more students and thus future osteopaths may embrace it as well. Participants did state that better teaching of the principles is necessary. One aspect that might improve the teaching of the principle is to discuss the historical lineage. Even the expert participants in this study were not able to fully detail its historical lineage accurately. Historical osteopathic texts are not always readily available, which further challenges the student. For enhanced teaching of osteopathic history, readily available historical information is needed. Finally, to enhance its

meaning for students and to demonstrate its multilayered teachings, the principle needs to be clearly stated in teaching methodology.

6.1.3. Learning the fluid body is unique and distinguishes traditional osteopathy

Learning osteopathy takes a long time. Still taught that in order to know the abnormal, the osteopath must know the normal very well. Because every person's physiology is slightly different, truly identifying a normal healthy physiology takes extensive practice. This concept is true in every tissue. Knowing the normal palpation of bony tissue is not the same as fascia or vasculature. The osteopathic student must master each field. A couple of participants voiced the need to master each layer before proceeding to the fluid realm, as the inexperienced student may become lost. The palpation in this field is unique; the osteopath is required to have an observing volumetric palpation which is quite different from sinking to the level of the tissue. At a basic level, maintaining the fulcrum and balancing two volumes is challenging for the student. Many participants said that the teaching of the palpation of the fluids needs to be improved. Because the study demonstrated that participants learned to treat the fluid body through mentorship, an examination of mentorship may reveal key components of learning to treat in this field. One-on-one palpation validation and guidance is the main element and is substantiated by the data. This speaks to class sizes, teaching assistants, accessibility to teachers, and mentorship programs pre- and post-graduation. Further, the journey of discovery through experience and then validation with a mentor is also important to note. This also validates the osteopath as having their own unique pathway of learning and it gives insight into how this unique palpation is learned.

A concept embodied in the principle, “the role of the artery is absolute,” is that the osteopath treats the person and not just the body. It is through the fluid fields that wholeness expresses itself, be it by expansion and retraction in vitality or by the Tide. Learning this concept shifts the student from a more allopathic view to a traditional osteopathic view. There must be better teaching of fluxes and flows to achieve clarity of the principle. Additionally, clarity of what is embodied in the principle but not mentioned, such as the Tide, biodynamics, vehicle and driver/body and person, wholeness, needs to have some further directive.

6.2. Recommendations

The researcher offers recommendations based on findings, analysis, and conclusions. The recommendations that follow are for (a) CEO faculty, (b) current and prospective students of osteopathy, and (c) future research.

6.2.1. Recommendations for CEO faculty

Traditional osteopathy in Canada does not yet enjoy a secure place in the landscape of healthcare, and the following recommendations attempt to address this insecurity. These recommendations should be reviewed on an individual basis for their appropriateness as the college is evidently reviewing curriculum on an ongoing basis and these recommendations may already have been considered.

The CEO faculty should:

A. Teach at the undergraduate and postgraduate levels or take part in mentorship programs.

B. Teach the historical lineage of the principles.

C. Take part in a focus group concerning the guiding principles; their role, their content, and the wording.

D. Identify, define, and teach all concepts embodied within the principle, the role of the artery is absolute.

E. Define the palpation and treatment of the vascular tree because it is unique.

F. Increase mentorship programs and postgraduate courses at satellite campuses.

G. Encourage students to embrace traditional osteopathy as a life-long learning journey and value the individual path.

H. Demonstrate all possibilities in the fluid realm through palpatory experience to inspire postgraduate learning.

I. Demonstrate through palpatory experience that the osteopath is treating the whole person.

6.2.2. Recommendations for undergraduate and postgraduate students

The researcher recommends that students enrolled in osteopathic studies at all levels should:

1. Read historical osteopathic texts and work to improve their availability.
2. Seek out mentorship relationships even if there are no formal programs.
3. Attend osteopathic conferences and postgraduate courses.
4. Lobby for more postgraduate courses at satellite campuses.
5. Read osteopathic journals and engage in debate over the future of osteopathy.
6. Educate the public on osteopathic principles and epistemology.

6.2.3. Recommendations for future research

The researcher recommends further studies to be conducted to build a body of information that will ultimately lead to the first university program in osteopathy in Canada. The following should be considered:

1. Based on the limitations of this study, a survey of a larger sample of Canadian osteopaths should be conducted to assess whether and how the larger body of Canadian osteopaths treat the fluids and liquids.
2. A focus group should be held on the guiding principles, their role, content, and wording. The results should be analysed, assessed, and revisions should be considered.
3. Case study or outcome-based studies should be encouraged and valued at the postgraduate level.

6.3. Reflections

Osteopathy is as simple as it is complex, and osteopathic principles are not easily reduced to short phrases. The traditional osteopathy practiced by the participants in this study is not easily expressed through words but lends itself to experience instead. In light of this, the debate regarding osteopathic principles will likely continue as we seek ways to distinguish the profession and maintain the traditional osteopathy at a crucial time in osteopathic history.

The original query for this project was curiosity surrounding a guiding principle the researcher did not fully understand. This study has more than satisfied that curiosity and the researcher is grateful and humbled to have gained knowledge from such courageous osteopaths past and present. The principle has so many applicable layers, from daily

interactions with patients to questioning where the potency originates. If the principle is to be changed, it must continue to hold all of teachings in its meaning in order to help preserve traditional osteopathy.

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APPENDIX 1

3. METHODS

This thesis will take a constructivist grounded theory approach including a literature review and audio recorded interviews. A constructivist position allows an « interactive, participatory, and reflexive » role. Analysis in constructivist grounded theory results when « codes and categories are actively constructed through an active interpretive process. » In this approach, « theory is constructed and represents a re-construction of multiple realities. » (as cited in Thompson et al., 2014, p. 172)

3.1. Constructivist Grounded Theory Approach

In this constructivist grounded theory approach, the researcher will first research and document the lineage of A.T. Still's principle 'the rule of the artery is absolute' in a literature review as it came to be included in the core principles at the CEO. This will include an audio recorded interview with Philippe Druelle, D.O. to gain insight into how this principle was chosen to be amongst the core principles. English translation may be needed. Interview questions may further evolve from this phase.

Interviews with osteopaths will follow. Interviews will be audio recorded, transcribed verbatim, coded, categorized and analysed. Transcripts will be made available for further comment and verification of intent. The aim of the interview is to ilicit answers that have depth and richness in content.

Categories may evolve to reflect:

how osteopaths relate to this principle, ie. Professional identity

whether they use the principle directly or indirectly; what is their methodology when it comes to incorporating this principle

whether this principle applies more to particular target groups and/or pathologies in their clinical practice and whether the osteopath has observed repeated or consistent success with one particular treatment approach to a pathological situation

where or from whom do they feel they learned the skills and gained the most awareness to treat blood flow effectively. Did their learning occur in the natural progression of professional development ? How does their learning experience affect the decisions they make in clinical practice ? Did this learning experience provide a shift in their methodology of treatment ? Have treatment aims shifted and were outcomes changed. (Bloomberg, Volpe, 2012, p. 106) Caution will be expressed that this content reflects perceptions and not facts. (Patterson, 2011, p. 1026) Was their learning incidental or otherwise ?

3.2. Sampling Strategy

To choose a Canadian group who is actively practicing and engaged in research or curriculum development in the field of osteopathy. This is a « purposive sampling (which) involves the intentional selection of information-rich cases from which one can learn a great deal about the issues of central importance to the purpose of the research. » (Patton, 2002. As cited in Thompson et al., 2014, p. 175)

3.2.1. sampling group

The population for sampling is Canadian Osteopaths who:

received their osteopathic education from a college in Canada with a minimum of 1000 hours

have a minimum of 10 years experience working as osteopaths post graduate

or who have a minimum of 5 years experience and who have published work that relates to the osteopathic principles, including 'the rule of the artery is absolute'

or are or have been a faculty member at the Canadian College of Osteopathy or other recognized osteopathic institution(s) internationally

or have presented research or who have given courses at international osteopathic conferences with a minimum of 5 years post graduate working experience

Canadian osteopathic association(s) data bases will be used to recruit willing participants by mail with a follow up email; list(s) will be cross referenced with CEO graduate lists; snowball effect meeting the above criteria and to search extreme cases will be used.

Participants will be asked to fill out a personnal data sheet to record the specifics of the demographics. A demographic matrix will be included in the thesis. The data sheet will reflect age, gender, province of residence, college and campus attended, previous and post graduate education and courses, number of teaching years, number of published articles or books, and number of times an international osteopathic conference has been attended.

Table 1. Participant Demographics Matrix

Participant (by pseudonym)	Age	Gender	Province of residence	College attended	Other education	# of teaching years	# of published works	# of conferences attended	Multi clinic or solo
Participant									

1 Participant 2 Participant 3 Participant 4									
N = 10									

3.2.2. Key informants

An interview with Philippe Druelle, D.O. will provide the necessary insight as to how the principle, 'the rule of the artery is absolute' came to be chosen as a core principle at the CEO.

3.2.3. Relevance

The aim of this thesis is to reveal what is not known about the successful treatment of blood flow in Canadian osteopathic manual therapy. The sampling strategies narrow the field of participants so that they will serve as learning tools for the future of the practice.

3.3. Tools for data collection

The tools for data collection will reflect contextual, demographic, and perceptual types of information. The methods used will include a literature review, interview with a key informant, sampling strategies, demographics questionnaire, and interview.

3.3.1. Tools for data collection, triangulation and methods

Table 2. Overview of methods to obtain the information needed

Type of information	What information is required	Method
Contextual	History of the principle 'the rule of the artery is absolute'; lineage of how it came to be included in the CEO principles;	-Literature review -Interview with Philippe Druelle (key informer #1) -Interview

	discussion of the wording of this principle 'rule' vs 'role; how the CEO was founded; statement of CEO mission, values, and vision*; statement of Canadian Association(s) mission, values, and vision; statement of osteopaths' perception of osteopathic culture in Canada	
Demographic	Descriptive information of participants See Table 1	Survey/data sheet
Perceptual	Participant's descriptions and explanations of their experiences as it relates to the principle under study	-In-depth interview (See Table 3) -Observation of clinical practice

(Bloomber et al., 21012, p.107)

*The extensive contextual information on the CEO is required because the intent of this research is to provide a document which might be helpful in future pedegogical development at the CEO

My intention with the following one hour interview questions is to create a semi-structured interview using an interview guide. It will be an in-depth interview, one on one. The aim is to ask open ended questions, illiciting rich deep content and leave with valid information. The interview will be pre-tested on a non-participant to check depth of answers and timing. The intention is not to exceed a one hour time limit so that participants do not fatigue from answering too many questions which would potentially affect the quality of the later questions.

Table 3. Research Questions and Interview Questions Matrix

Interview Questions	Research Questions		
1. How do you incorporate A.T.	Are osteopaths	How is this	How does this

Still's principle, 'the rule of the artery is absolute' in your practice? (Diagnositic and/or treatment)	in Canada using the principle in study to guide testing & treatment	principle used, direct or indirect	principle influence Canadian osteopaths ?
2. Methodologically speaking, what role does this principle play? Meaning is it a primary goal to increase blood flow or free neural pathways (for example) or does it happen as a result of other techniques not focused on vasomotion.	How is this principle used, direct or indirect	What tests and/or techniques are being used to increase blood flow	
3. Have you noticed any key successes in the history of your practice when vasomotion was improved? How did it come about?	Are osteopaths using this principle with specific target groups or pathologies	What target groups or pathologies benefit significantly from increased blood flow	Is there a case study that the participant feels was significant, as it relates to this principle
4. Is there a target group where you find yourself trying to increase blood flow or freeing fluid pathways as a primary goal? Why	Are osteopaths using this principle with specific target groups or pathologies	What target groups or pathologies benefit significantly from increased blood flow	
5. Are there instances in your practice when you find that the application of this principle leads to consistent results? Such as A.T.Still's teaching, 'turn in the ovarian artery' (reference) in stalled labor?	Are osteopaths using this principle with specific target groups or pathologies	What target groups or pathologies benefit significantly from increased blood flow	Is there a specific tool osteopaths are using to increase blood flow in a particular pathophysiological state
6. Did you learn techniques or methodology to support this principle in school or post grad? Subquestions: When do you think you started focusing on vasomotion? Was there a key mentor, teacher or author who really awakened this in your awareness? Or perhaps a difficult case or pathology? Was your	What are osteopaths' perceptions of when (or if) this principle came into their awareness and implemented into clinical practice and	Do osteopaths perceive that they received a strong foundation in the principle in their osteopathic (undergraduate) training	What was the awakening light that prompted the presence of this principle in osteopaths consciousness

learning experience incidental or otherwise? What was your professional development that lead you to use this principle?	how		
7. Do you have any thoughts or suggestions on how to best transmit this knowledge to students of osteopathy?	Can this thesis be of use to future curriculum development	Do osteopaths perceive that they had a strong foundation in the principle in their oeteopathic (undergraduate) training	
8. (Bias question) Do you use this principle because it works or because you feel you should honour Still's principles?	What is the source of why osteopaths may use this principle in clinical methodology	Is the researcher leading answers	What is the relationship between osteopaths and the founding principles of osteopathy

3.4. Internal validity of study

Strategies to increase the validity of the study are:

Pretesting interview and observation: Pretesting the interview questions with one non-participant osteopath with subsequent coding, categorizing, and analysis of results. The results will be presented to a pre-reader and advisor for feedback.

After the interview, transcripts will be made available so that participants may corroborate raw data.

After the interview phase and after the observation phase, analysis of data will be presented to the advisor.

Triangulation of data is achieved through multiple sources of data collection: demographics data sheet and in-depth one on one interviews.

Data analysis will be presented to Barb Keddy for review of analysis

A journal log will be kept documenting every step of the research process

Memo writing will contribute to an audit trail to « demonstrate how the study was conducted and explicate how the theory was developed. » (Thompson et al., 2014, p. 178)

3.5. Bias and management of the subjectivity

The original idea for this thesis came from Jane Stark. During her course in Halifax on the intestines in 2013, she was discussing her research of Still's osteopathic principles. She mentioned that a possible research topic regarding the principle, 'the rule of the artery is absolute' might be of interest.

The aim of this research is to gather data with an objective point of view and not attempt to skew the data in the wording of the interview questions, in the coding and category creation, or analysis. The pre-reader and advisor will be asked if this is occurring throughout the process. A journal log will be kept of the research process and it will include reflections on possible bias during each phase.

3.6. Data Saturation

By keeping the sampling strategies specific, the data saturation point should be achieved with fewer numbers than in a more broad study. An example of a more broad study with similar aims is the recent study in the UK which examined how osteopaths in the UK identify with the principles of osteopathy. (Thompson et al., 2014, p. 146-159) For this study,

twelve participants were chosen for data saturation. Data saturation occurs when no new information can be gathered and no new conclusions can be made. This may be challenging given one of the aims of this study is to discover where osteopaths are acquiring the knowledge and skill to treat blood flow above and beyond their undergraduate study. In post graduate study, this could be anywhere.

Extreme cases will be noted, categorized and analysed separately to give depth and breadth to the research. They will be analyzed with reflections on the literature. Extreme cases will be embraced as they could be where very interesting work is taking place. For example, in some respects, Paul Chauffour's *Mechanical Link,* which originated out of one of Still's techniques as documented in the foreword by Steve Paulus, DO, (US), (2009, p. 17-18) could be considered an extreme case in the literature.

3.7. Ethical considerations

The participants in this study will be informed and respected. Written informed consent will be required from each partipant and will be gathered before the interview phase. Confidentiality and anonymity of the participants will be upheld.

Participants and patients will be informed that have the right to withdraw from the study at any time, even if the interview session has already begun.

APPENDIX 2

Research proposal – Halifax
January 21st, 2015

CONSENSUS SHEET

Those are comments and recommendations made by the board of examiners regarding the protocol of **Heather PIERCE CORMIER**, 5th year student in Halifax. Your thesis advisor will make sure that the proposed recommendations are taken into consideration when you finalize your research project.

CORRECTIONS REQUESTED: (√: accepted as is _____ minor ✓ major _____)

COMMENTS:

Protocol (1) Change "Aim and objectives" page header to read "Research Questions"

Protocol (2) Remove any/all written descriptions of the CEO 5 yr Training regarding "the Rule of the Nitty is Absolu

Protocol (3) Remove under Methodology - "Observing clinical sessions"

Protocol (4) Include international sources for Lit. Review

Velda Lulic, D.O.

Peter Goodman, D.O.M.P.

Done in Montreal, March 2012

APPENDIX 3

Example of Memo writing
Memo writing was also kept in a hand written journal and can be made available to the jury.

Memo writing after initial coding phase

Initial open coding is emergent from the data
Shows that original research questions are of some interest.
The area of greatest note is the how osteopaths work in the fluid body which includes the vascular tree, circulation, etc.
Need to define fluid body as separate from vascular tree?
The area that is not of great interest is how osteopaths treat pathology, although some interest is there in terms of general methodology such as clear a pathway for drainage and open the pathway to allow new nourishment.
Interestingly, it doesn't matter whether osteopaths were taught about fluids and treating the vascular tree directly in undergrad. All treat it at some level in their later years. Most learned the majority of what they know post grad. Mentors figure prominently in their development of skills.
Also, the application of the principle and the interpretation of the principle does not really seem to bear a lot of results in terms of whether or not osteopaths treat fluids and or vascular tree, etc. It's as if, it has been disreguarded either way. That is potentially interesting in terms of importance of principles. It is clear that there is an underlying principle that isn't spelled out and that is working with the PRM, which is the fluids. Do I need to change this word fluids? Has so much more meaning than I may mean to imply.
So then, what is the importance of principles? I did not ask this question of the participants. Some did voice that it should be about osteopathy as opposed to health. The principle reflects health not osteopathy specifically.
In regards to education, overwhelmingly, participants would like the principle revised, increased palpation skills taught and validated, and some wanted the principles themwselves to be built upon. Interestingly, there is some consensus that the palpation needs to be there for the student to understand the concept being taught. The two need to go in tandem, or a delicate balance of introduction of concept followed by introduction of palpation, one following the other. The palpation needs to include validation, hands on validation. Presumably so no student gets left behind. Presumably, if a student gets to 4th year and still can't palpate the PRM of bone tissue, they might have difficulty being introduced to fluids in the lymphatics class. However, as one participant pointed out, it is quite typical for students to select their own entry point which may not be the same as their fellow student. Learning is not necessarily linear then. There is a sense of individual journey, osteopaths have to come to it in their own unique way. This is reflected in the findings of how osteopaths came to learn about fluids. They all do but how and when they come to it is not comparable, it more a smatering of ways and timelines.
There then rebegs the question as to whether having principles is necessary? It's hard to ask this actually because I selected experts. What if I had designed the study to poll all osteopaths

in Canada until I had reached saturation? Perhaps then I would be better able to ask the question. Then perhaps we would see if osteopaths are all treating the fluids. Whether the participants in this study incorporate the principle had little bearing on whether they treat the fluids. Again coming back to the theory that the principle was disreguarded, set by the way-side. Another principle in relation to the PRM is underlying in all.

Since a majority want the principle revised, we can look at it from the point of view that these are experts, so they are using the PRM in diagnostics and treatment and intergration with the long tide. They are incorporating the vascular yes, the nervous system yes, lyphatics, CSF, etc but just like the other mechanisms. They are treating the seven mechanisms? As they present themselves. Few participants said they actively see and search for vascular lesions for example. What comes is of course from the health intake if symptoms lead to fluid flow lesions, pressure irregularities, low vitality, congestion, fatigue, etc. But with one or two exceptions, it appeared that the body tells the osteopath what to treat and in what order. This is indicated by the entry door, structure first or structure governs function, and the idea of structures/tissues presenting themselves to the osteopath. Not the osteopath sourcing it out – in terms of fluids or vasculature tree. Exceptions are in practiced individuals who have observed patterns in paticular pathologies such as idiopathic scoliosis, concussion, and TOS, or swelling in extremities, or vitalty problems. These were common situations where the osteopath knew there was a fluid flow problem be it stasis, congestion, tubbing lesion such as a twist or shear resultant in flow deficiency, or another such as the diaphragm or fascia impeding flow, or that the vitality is slow from a fluid flow or potency problem. This seems to start to get away from the notion of the principle.

The meaning and incorporation of the principle at some levels did reflect the skill of the practitioner. In a few cases, the osteopath reflected on their earlier years as a student or recent grad and said they did not incorporate the principle because they did not have the tools, or equally they did not treat the fluids because they did not have the tools except indirectly.

A very common recurrence is that participants let nature do the rest. Sometimes, we hear this referred to as leave it alone from find it fix it leave it alone but as one participant said Still said let nature do the rest. This is not exactly the same as leave it alone. Let nature do the rest implies the job of the osteopath is to trigger physiology to work correctly so that when they leave the person, the body can continue working and continue the physiological processes that were allowed in treatment. Further, some participants clearly defined the end of treatment as restoring the person as the pilot, or harmonizing the treatment with the body.

Charmaz asks what do the participants think, feel, act while involved in this process. This has not yet been thoroughly addressed in my coding. However, I have noticed that there is a hint of a suggestion that now the curriculem is much better because students get some liquid body palpation and intro to the seven mechanisms in 4th year. Note the cranio-sacral mechanism and the PRM are taught in first year, this is already a level of palpation students would not have experienced before in other disciplines unless they took Upledger courses through massage therapy. Charmaz asks what are the consequences of the process? Well, all the osteopaths I interviewed practice at some level in the liquid body and so it obviously didn't have a negative impact. However, we don't know whether it was a bad thing because we can't rewrite history. Could they have benefitted from earlier introduction? Perhaps not, perhaps doing one level of palpation really well before you move to the next is an very important factor. Brad's quote of Philippe echoes this as he said that he asked Philippe about feeling something and Philippe said once you feel it I will tell you. Also, there is what P8 was saying

and that is that everyone needs to gain entry to the system individually and that doesn't mean that one is better than the other. No participant suggested that the liquids should not be taught in undergrad, they all said it should be which is contrary to most of their own experiences. Therefore, I can conclude that they might wish they had had some introduction to the concept earlier.

The category interpretation of the principle showed that there was no overwhelming majority in terms if the interpretation. Could the data show that it doesn't matter that much to the participants. That it was something they were taught in school but they never understood it at that time except through indirect techniques. The palpation of tissue change once the flow was on, didn't happen in the majority of participants undergrad experience. So, if they just said ok, there are these principles, and as P9 said they were there to help with methodology that's fine, but from the beginning that principle didn't mean that much. There is certainly some confusion. So some participants viewed the principle literally. This needs to be cross-referenced with whether those participants have read and understood Still. They might have read Still, clearly the majority has, this could be a code. But whether they understood his writing is another matter that can't be measured in this studies' data. Anyway, if you take the principle in isolation, yes, Still was saying that tissue needs, must, absolutely needs blood supply. However, he also said many fluids are of great importance. So there again, the issue of the specific nature of the wording is problematic. Still never meant for there to be a hierarchy of fluids across the board, at all times. Depending on the nature of the problem, each fluid must be on time and do their job. So taking the specific wording seems indeed problematic from the beginning. As P1 said of my initial questions and interpretation which was fuzzy at best because I hadn't read enough yet, she said I was trying to take apart something that shouldn't be taken apart. Is that not what is happening when we choose this wording and this concept. Is there not confusion? It was not ever intended to be obviously but nevertheless, problems do seem to arise from the wording because, some participants said they do not use the principle and yet they treat the liquids and flow. Quite a few participants say that they do incorporate the principle, but once you interpret the principle as all flux and flow, of course they incorporate it. But their treatment doesn't differ that much from those who say they don't incorporate it. The chart showing how osteopaths treat fluid flow demonstrates that they use many common concepts and themes. Namely the long tide or biodynamics. And work in the pressure systems, and treat the vascular tree directly.

This takes us all the way back again to the importance of principles. The elephant in the room is the palpation and the PRM. These two big factors that osteopaths use, as was evident when the majority stated that they use the PRM especially in diagnostics and not arterial flow or pulse, etc. That they viewed the PRM as more encompassing. P6 indicated that if the fluids or vascular flow is compromised in some way, the PRM will also be affected. Vitality will be affected. Just like if you had too many structural lesions. As P1 said. So is the PRM not more encompassing. Should there not be a principle that expresses the PRM? What would Still say? He did not know yet of the PRM although illuded to it. He did not know it as we know it. Sutherland was the one who developed the initial PRM concept through the cranio-sacral system, fulcrum, axis. And then others such as Becker took that and delved into the fluids. James Jealous also with his biodynamic work. So, from the data is this emerging? Yes. I think yes. Especially when you compare that many participants talked of structure governs function as a principle that trully guides their work. This needs to be coded.

So, initially the category was interpretation of the principle and I thought maybe that would lead to a linear incorporation but it doesn't. The emerging category needs to be more like

what are they using? Yes, they are treating the vascular system, the circulatory system, the fluid body. It is indeed prevalent in their everyday treatment. This was evident from the data. But it is within a greater picture. The picture at it's most global – the person, then the body, then the systems or mechanisms, then the regional tissue, then the local tissue. The physiology suggests we can't make huge changes at the level of the arterioles and venules meeting place and exchange with the interstitial fluid. Local tissue makes its own by diffusion and osmosis. So really we are working with many tools to free the flow so to speak. Osteopaths work with the tubing, with the pressures, with the fascia, the diaphragm, the ventricals, the lymphatic system, the nervous system, etc etc.

Is knowing the lineage of the principle really important. From the lit review and from what most osteopaths said, it is based on Still's writing but was changed. Some know more about context, about comparisons between supreme from Sutherland and absolute from Still, but really at the end of the day, again, whether they have a strong grasp of history doesn't play out in working at more levels. In fact, one particpant who showed a great deal of historical knowledge didn't share the depth of treatment range that some of the others did. That is perhaps the attitude of the participant however who had a hard time asnwering the questions. So perhaps that has to be followed up on. If possible, it would be good to ask some very specific follow up questions of that participant to clearly portray an accurate picture.

So there is a bit of a short coming in that I didn't ask specifically about the PRM although many offerred it anyway. Need to go back through and check this.

The RQ of pathologies was evidently from the get go not a question that was well liked, neither was the methodology question. The methodology question ended in basically osteopaths stating the obvious which was, they follow the basic methodology of the college but the entry door, or the person or baody always trumps this. There is hierarchy of lesion and then there is how you approach treatment. Not the same. So this RQ isn't such a great one to directly turn into a category. It would be better to create a category that illustrates this main conclusion based on the data. So codes need to reflect how the osteopaths approach treatment with the fluids, so they prep the area by ensuring drainage routes, they help bring nutrients and oxygen via arterial blood to areas of stasis, they work with the pressure systems and nervous systems to further uninhibit fluid pathways, and they work with the CSF and the ventricals, and they use the long tide to integrate and ensure that nature will do the rest, nature/physiology will keep working after the treatment is over. So that has come from the methodology question. The only time yes the methodology question was revealing of treatment was when P1 and P5 talked about shears in the tubing or that the tubing didn't meet the tissue growth. In these cases there is a npworta with P1s example and another, perhaps more embryologically based example from P5. Need to further Bleckshmidt reading. So, reguardless, with the shear we are looking at tissue with no axis and a fixity as a fulcrum that is not within reference to a midline. Reference to the midline was a concept really explained by P6.

The question of pathologies wasn't well received initially – this needs to be coded, I think because this is not osteopathic thinking. Anyone can find desease. In any case, it still generated data . To this day, I'm not sure how better I could have framed the question. At the end of the day, osteopaths take into account symptomatology in their assessment, otherwise we wouldn't do an health intake or talk to our patients before the treatment. P10 made a point of saying that he takes time with hie patients at the beginning of each session to check in. Checking-in reveals whether he was able to get to the cause, as he indicated, if the patient only felt better for a few days, he did not achieve this goal of getting to the root. And since that is

also another important osteopathic tenent, why do we not have this ias part of guiding principles. I guess that's why there was an entire issue of IJOM devoted to this topic haha. In terms of pathologies, a few surfaced as being old standbys. The thing is, I had the same principle in massage therapy college, clear the pathway first and bring oxygen and nutrients and flow to flush and nourish tissues. This was taught for TOS, swelling of the extremities, etc. And this was echoed by the osteopaths as well. So not that it is non-osteopathic but it is widely accepted as being a treatment protocol in more modalities than osteopathy. Don't make a beaver dam. Don't create a stasis for squatters. So, I don't know if I was looking for more than that in that question but I the treatment of concussion using some of these same principles did come up by a few osteopaths. Clearly, there was more to it. So a thesis on fluid flow in concussion would certainly be timely. Even a qualitative specific to concussion although it seems most are doing the same work of Philippe. Anyway, that data didn't serve to really reveal anything of great interest other than also a great long list of pathologies!
Returning to views on the principle, my initial thought was to make the category of professional identity Only a few participants brought up the issue of distinctiveness in reguards to principles and professional identity. But non the less, it is important. It was my short coming as a researcher for not asking more of this question. P4 indicated it was of interest but I didn't catch on in time. Anyway, it can be introduced and another thesis looking professional identity specifically could be done. This data merely raises the issue. What would have been best is to have a discussion of the participants about the principles and their thoughts and triangulate that way but that is a much bigger project. (focus group)
#3? Participants indicated that they would value some research done on the historical lineage of the principle. Now I need to go back to the literature and add more detail here. I will get the consensus paper from the museum.
Interestingly, the UK study on how osteopaths view themselves in relation to principles in general showed that they do use principles to help shape their practice. Several participants also said that structure governs function does indeed influence their practice. However, this can not be said of the role of the artery is absolute.
In Canada, osteopathic manual practice does not resemble the osteopathic medicine practiced in the United States. The education is different with a focus on therapy versus diagnostics. However, the debate regarding osteopathic principles is very relevant as D.O.M.P.s still need to identify themselves as unique to other manual therapy modalities such as chiropractic and physiotherapy.
Note that in the Foundations of osteopathic research, they combo respiration with circulation as did P10 in their patient approach models. Also several of the listed associated anatomy was listed by Canadian DOMPs when asked about pathology. So, in fact, in some regards there was value in that question.
Going back to the lit rev on Still. My conclusion was that there is no one hierarchical fluid. In different contexts different fluids are required to flow and act as very important. So what if the whole thesis reflects this. So instead of trying to see how osteopaths use fluids to treat which is a much broader context and one that dilutes the original question. What if I apply it as did Still. So in what contexts do osteopaths use the principle the role of the artery is absolute. This is revealed in the pathology questions also. This would keep the frame of the study. Instead of focusing whether they use it or not or their attitudes, just focus mainly on in what contexts or approaches to the body and person does this principle apply. Then in a way I will work backwards. Right now it just isnt working the way I am focusing on all the fluids. It also is going to create a monster lit review that will never end. There has to be some

parameters. This is coming out of Bleckshmidt where there are fields, biodynamic fields and change occurs within these fields. I need to have a limiting tissue haha.
In reading Bleckshmidt some points really stand out. One is that we are looking at embryology as a biokenetic study. So less in termsof molecular or pre-determined genetic study and more interms of each cell has its code but the change that occurs happens because its environment changes, not because it is preplanned to do so. The components involved in the change are largely due to nourishment and getting rid of wastes at a cellular level. Growth patterns are due to changes in quantity of fluid and nutrients available do to puch and pulling type of forces that change the cells exposure to its basic needs. Growth patterns that occur in early organ development are reflected in later function of the fully grown organ. A lot of folding and growing of the nervous base tissue occurs in the embryo. The reasons for the growing is space and position close to nourishment. The folding is happening due to restraining forces such as blood vessels, especially the aortas. The first vessels are capillary beds, the second are veins, the third are arteries. A functional unit of cranium, heart, liver with diaphragm between is interesting. The concept of the heart sucking blood from the liver is interesting, we always think of the pumping heart. The amount of blood supplied to the heart comes from the liver. In the context of the role of the artery is absolute, we can look at the polarity of the blood, we can look at vessels feeding nerves, we can look at vessels as restraining fields to growth, such as skeletal growth. Scoliosis, as P5 said. Change the supply of fluid and nourishment and space and you change the growth or the biodynamic space and change can occur. The symptom then is the expression of what is going on as an underlying environment. Change the environment. Palpation is then also an expression of what is underlying or underneath, we are not palpating the cause therefore but palpating the expression of an underlying dynamic.
Need to write a palpation blurb in lit rev.
My bias is appearing in my love for education. Necessary to be sure to review and study all roles of principles, not just for education.
Fluid drive remains an interesting area of query. P1 talks a lot about the charge surrounding the artery – more so than other vessels. And how it relates to embryology. This thread could be picked up and reinvestigated with the data.

APPENDIX 4

College d'Etudes Osteopathiques

Participant Consent Form

Heather Pierce Cormier
CEO, Halifax Campus
The principle, "the role of the artery is absolute" in osteopathic practice, a qualitative study
Thesis advisor: Janet Tait

I, Heather Pierce Cormier, am a student of College d'Etudes Osteopathiques. I am conducting a qualitative study on how osteopaths in Canada who have graduated from the CEO/CCO are incorporating the principle, "the role of the artery is absolute" in osteopathic treatment. I am going to give you information and invite you to be part of this study. You do not have to decide today if you want to be a part of this research. Before you decide you can ask me any questions you like to further understand this project. If this consent form is not clear to you please stop me at any time and I will take the time to clarify and explain anything you do not understand.

The purpose of this research is to document how osteopaths are incorporating the principle, "the role of the artery is absolute" in their practice. The purpose is to also gain insight into how osteopaths were taught these skills and to then share these methods in a published thesis.

This research will involve your participation in a one-on-one 30 minute interview with me. You will also be asked to complete a one page data-analysis sheet. After the interview, a transcript of the interview will be made available to you so that you may confirm that everything is correct. If you would like to add any further information you will be welcome in doing so.

You are being invited to take part in this research because I feel that you have valuable experience as an osteopath and can contribute much to our understanding and knowledge of the practice of osteopathy.

Your participation in this study is entirely voluntary and will not negatively impact you in any way if you do not decide to participate. You may also change your mind at any time even if you had previously agreed to take part.

If you accept, you will be asked to take part in a one-on-one interview. You may be asked questions similar to:

1. The CEO/CCO teaches the principle 'the role of the artery is absolute'. What is your understanding or interpretation of this principle? What is your understanding of its lineage? What fluids do you consider if/when you apply this principle?
2. How do you incorporate the principle 'the role of the artery is absolute' in your practice?
3. Methodologically speaking, what role does this principle play in treatment goals?
4. Do you this apply this principle to particular target groups or pathologies?

5. Are there instances in your practice when you find that the application of this principle leads to consistent results? Such as A. T. Still's teaching, 'turn in the ovarian artery' in stalled labor? Could you describe what you do?
6. What determines successful treatment in your practice, or when do you feel that a treatment is finished?
7. Did you mostly learn techniques or methodology to support this principle at the CEO/CCO undergrad or was it in post grad courses? Has any literary research or readings/authors influenced your philosophy of treatment?
8. Do you have any thoughts or suggestions on how to best transmit this knowledge to students of osteopathy? (undergrad or postgrad?) (techniques or concepts that should be developed?)

I will not ask you to share personal beliefs, practices or stories and you do not have to share any knowledge that you are not comfortable sharing.
The interview will take place in a quiet location and no one else will be present during the interview. The entire interview will be recorded. And you will not be identified on the recording. The recording will be kept on my personal computer. The information recorded is confidential and no one else except myself will have access to the tapes. The tapes will be destroyed after the completion of the project.
There will be no direct benefit to you, but your participation is likely to help other osteopaths learn about the treatment of the fluids.
You will not be provided any incentive to take part in the research.
All information given will be kept confidential and private. Any information about you will have a number on it instead of your name. Only the researcher and thesis advisor will know what your number is. It will not be shared with anyone else.

I have read the foregoing information, or it has been read to me. I have had the opportunity to ask questions about it and any questions I have been asked have been answered to my satisfaction. I consent voluntarily to be a participant in this study

Print Name of Participant_____
Signature of Participant _____
Date _____
Day/month/year

Statement by the researcher taking consent:

I have accurately read out the information sheet to the potential participant, and to the best of my ability made sure that the participant understands that the following will be done:

1. **All information gathered will be kept confidential**
2. **The participant will not be named**

3. **The participant may change his/her mind at any time and withdraw from the study and this will not affect him/her negatively in any way**

I confirm that the participant was given an opportunity to ask questions about the study, and all the questions asked by the participant have been answered correctly and to the best of my ability. I confirm that the individual has not been coerced into giving consent, and the consent has been given freely and voluntarily.

A copy of this ICF has been provided to the participant.

Print Name of Researcher taking the consent_____

Signature of Researcher taking the consent_____

Date _____

Day/month/year

APPENDIX 5

Demographics Data Sheet

Participant Form

Name of Participant	
Age	
Gender	
Province of residence	
Osteopathic College attended, campus, year of graduation	
Other education	
Number of teaching years in Osteopathy	
Number of published works (Osteopathic or related to Osteopathy)	
Number of Osteopathic related conferences attended	
Multidisciplinary clinic, solo practionioner, or osteopathic multipractitioner	

APPENDIX 6

Demographics Data

Participant age	between 20-29	between 30-39	between 40-49	between 50-59	between 60-69	between 70-79
P1			x			
P2			x			
P3						x
P4					x	
P5			x			
P6				x		
P7			x			
P8			x			
P9			x			
P10					x	
Total			6	1	2	1
			60.00%	10.00%	20.00%	10.00%

DO/DOMP	CEO/CCO	other		
P1	x			
P2	x			
P3		x		
P4	x			
P5	x			
P6	x			
P7	x			
P8	x			
P9	x			
P10	x			
total	9	1		
percentage	90.00%	10.00%		
	all graduated before 2011			

gender	Male	Female		
P1		x		
P2	x			
P3	x			
P4		x		
P5		x		
P6		x		
P7	x			
P8	x			
P9		x		
P10	x			
Total	5	5		
percentage	50.00%	50.00%		

teaching yrs osteo	under 5	5+	10+	20+
P1			x	
P2			x	
P3				x
P4			x	
P5	x			
P6			x	
P7			x	
P8			x	
P9			x	
P10		x		
total	1	1		1
percentage	10.00%	10.00%	70.00%	10.00%

Clinic Type	solo	multidiscipline	osteopathy multi-practitioner		
P1			x		
P2	x				
P3			x		
P4	x				
P5		x			
P6		x			
P7			x		
P8	x				
P9			x		
P10		x			
total	3	3	4		
percentage	30.00%	30.00%	40.00%		

publications	0	1	2	3	5+
P1	x				
P2					x
P3			x		
P4					x
P5		x			
P6	x				
P7				x	
P8	x				
P9	x				
P10		x			
total	4	2	1	1	2
percentage	40.00%	20.00%	10.00%	10.00%	20.00%
	60 % have one or more publications				

Conferences attended	over 10	over 20	over 50		
P1			x		
P2		x			
P3			x		
P4					
P5					
P6		x			
P7		x			
P8		x			
P9	x				
P10	x				
total					
percentage					

other education	physiotherapy	massage therapy	masters	BA/BSc	other
P1	x			x	
P2			x	x	
P3			x	x	
P4			x	x	x
P5	x		x	x	
P6		x		x	
P7	x			x	
P8					x
P9				x	
P10			x	x	x
total	3	1	5	9	3
percentage	30.00%	10.00%	50.00%	90.00%	30.00%

province of residence	Ontario	Quebec	Nova Scotia	
P1		x		
P2	x			
P3		x		
P4	x			
P5			x	
P6			x	
P7		x		
P8		x		
P9		x		
P10			x	
total	2	5	3	
percentage	20.00%	50.00%	30.00%	

APPENDIX 7

Participant Interview Data

Knowledge of the history of the principle

Research Q? Do osteopaths know the historical lineage of the principle?

Participant	Believe it came as a direct quote from Still	Believe it is grounded in Still's work but wording was changed, not sure of by whom	Demonstrates a comprehensive knowledge of the lineage	didn't say
P1		x	x	
P2		x	x	
P3		x	x	
P4		x	x	
P5				
P6		x		
P7	x			
P8				
P9		x		
P10		x		
totals	1	7	4	0
%	10%	70%	40%	0%

Interpretation of Principle

How do Canadian osteopaths interpret the principle?

Participant	Understands the principle to only include arterial flow as per wording IOPB	Understands the principle to mean the concept of circulation and all the fluids that are involved IOPC	Understands the principle to include all circulation, flows and flux (incl. fields) IOPFF	Shows contradictions in understanding of principle or demonstrates unclear or multiple interpretations IOPUC	sees all of the principles as interrelated IOPIN
P1			x		x
P2	x				
P3 KI			x		
P4	x				
P5					
P6	x				
P7		x			
P8	x				
P9			x		x
P10				x	
total	4	1	3	1	2
%	40%	10%	30%	10%	20%

Perceptions of the principle and osteopathy generally

Do osteopaths think we need guiding principles

Participants	do principles need to make us distinct?	didn't say
P1		x
P2		x
P3		x
P4	x	
P5		x
P6	x	
P7		x
P8		x
P9		x
P10		x
	2	8

Principle in treatment

Do osteopaths incorporate the principle?

Participant	Incorporates Principle	Does not incorporate principle
P1	x	
P2	x	
P3	x	
P4		x
P5	x	
P6		x
P7	x	
P8		x
P9	x	
P10	x	
totals	7	3
%	70%	30%

Education - Learning

how did osteopaths learn how to treat fluids/liquids?

Participant	learned how to apply principle in undergrad	did not learn how to apply principle in undergrad	learned primarily from experience	learned primarily from a mentor postgrad EdM	learned from a postgrad course	learned from author/books	did not say	reveals palpation skills directly relate to treatment of fluids
P1								
P2				x		x		x
P3								
P4				x				
P5					x			
P6			x					
P7		x		x		x		
P8		x		x				
P9		x	x	x				
P10		x		x				
totals	0	4	2	6	1	2	0	1
%	0%	40%	20%	60%	10%	20%	0%	10%

Education - Curriculum development

How do osteopaths suggest teaching the principle and the fluid body?

Participant	Introduce the concept in the first year	techniques need to be developed/taught better/palpation needs to be improved	teaching of principles needs to be improved	didn't say anything about curriculem	palpation skills need to match curriculem content
P1				x	
P2		x			
P3					
P4		x	x		
P5				x	
P6		x			
P7		x	x		
P8					x
P9	x		x		x
P10	x		x		
totals	2	4	4	2	2
%	20%	40%	40%	20%	20%

Conceptualizing
-the person, -the body

Participants	Biodynamics or the Long Tide	Vehicle & Driver
P1	x	x
P2	x	
P3	x	
P4		
P5	x	
P6	x	
P7	x	
P8	x	
P9	x	x
P10		
total	80%	20%

Attitudes towards the wording of the principle

Does the wording of the principle ultimately affect learning?

Participant	thinks principle should be revised PWR	Likes the principle the way it is	Demonstrates caution or reservations re wording	Didn't say
P1				x
P2			x	
P3				x
P4	x			
P5		x		
P6	x			
P7		x		
P8				
P9				
P10	x			
totals	3	2	1	2
%	30%	20%	10%	20%

Mentorship and Palpation

Participants	learning via palpation & self discovery	learning via mentoriship	validation of palpation & discovery	palpation makes osteopathy unique	palpation =skill
P1					
P2		x			x
P3					
P4		x			
P5					
P6					
P7		x			
P8		x			
P9		x			
P10		x			
total		6			1
		60%			10%

Incorporating the principle - pathology

	participants use the principle for specific pathologies	participants don't feel like they incorporate the principle for specific pathologies	participants felt like liquid and fluid treatment play a key role in certain pathologies	related flow to physiological or osteopathic concepts more than pathologies
P1			x	
P2		x	x	
P3	x		x	
P4			x	
P5		x	x	
P6				
P7				x
P8				x
P9				x
P10				x
totals	1	2	5	4
%	10%	20%	50%	40%

fluid and liquid tx'm plays a role in the treatment of some symptom pictures

	concussion PathC	TOS, pelvic inlet/outlet Path TOS/LE comp syn*	didn't say	other PathO
P1	x	x		x
P2	x			
P3	x			x
P4		x	x	
P5				x
P6				x
P7				x
P8				
P9				
P10		x		
totals	3	3	1	5
%	30%	30%	10%	50%

*compartment syndrome was included in symptom pictures like TOS
other: (did not appear more than twice in data frequency)
cerebral palsy
whiplash
chronic fatigue 2
fibromyalgia 2
chronic pain
gut-brain
autoimmune
parasites
CRPS
dysmenorhea
Back flow flutters of heart
turbulence flow flutters at heart
thyroid problems
results from discocorporeals/2nd degree lesions
traumatic shear of vessel
idiopathic scoliosis
sherman's kyphosis
chronic sciatic symptoms
neck spasm
knee pain
blood clots
vasculiitis
Parkinson's
head tics
seizures
Raynauds
prosthetics
scaphoid problems
mastectomies
scarring
burns
rods in spine
brain fog/lack of concentration
frozen shoulder
chronic capsulitis
chronic muskuloskeletal condition
reverse breathing patterns
GI tract problems
kidneys

APPENDIX 8

Conceptual Framework

The conceptual framework is an essential tool which guides research choices. It is a dynamic means by which the researcher can map the territory of the phenomenon at hand. The conceptual framework ultimately helps to focus the study and develop theory as it helps build relationships between concepts. It is a circular dynamism in that the research influences the conceptual framework and vice versa. (Bloomberg & Volpe, 2012, 86-89)

The role of the artery is absolute, as a principle

Classification of principles ~ osteopathic principles, health/physiology principles, approaches to patient care or treatment methodology

Wording of principle ~ concern over quoting without context, staying current, valueing the founding concepts, does the principle embody what it needs to, wording as misguiding without historical study

Perceptions of principle ~ goal of treatment, direct/indirect technique, relationship with the person, relationship with potency and vitality, relationship to the Tide, fulcrum, and balance point, value of historical knowledge

Change of wording, change of meaning ~ the rule of the artery: fluid driver, the artery is supreme but the CSF is in command, the role of the artery – does the change of wording really change the meaning

Existence of principle in other colleges ~ concept still present although not as a main principle, as an approach to treatment/patient care
How they incorporate the principle Approach to treatment ~ prep the tissue, techniques to treat the vascular tree, using concepts based in embryology, the vascular tree as vulnerable, splinting and growth in adolescents and scoliosis, PRM for diagnosis, integration of treatment via the Tide, blood feeds the nerves Let nature do the rest ~ tapping into potency, the Breath of Life, align the structure and the physiology will flow, unempeded fluid flow will restore health, treating the liquids indirectly via the frame/structure Trauma ~ force vectors, sheering of the vascular tree, relationships to the midline Treatment of fluids versus the principle Indirect techniques ~ spinal lesions and sympathetic disruption for vasomotion, fascial release, the cranial concept, Diagnostics ~ palpation and congestion, palpation and pressures, palpation and shears, palpation and force vectors, PRM, vitality, observation and liquid lesions, through the fascial web, pulse, tone, Pathology or physiological states ~ concussion, congestion, edema, pathology of vasculature, pressure gradiant problems

The ventricals and the CSF/cranial work
How they learned Study of historical texts ~ indepth study versus fragment learning, Palpation ~ difficult to measure, invaluable tool, a skill that requires one-on-one validation, evidence based medicine Physiology ~ laws or normal physiology versus abnormal Mentor ~ value of person to person learning with difficult concepts, many greats are gone, time and space for mentorship Undergraduate coursework ~ palpation and knowledge, one step at a time, pacing of how we acquire knowledge, layering palpation with physiology with undocumented knowing, principles and learning Postgraduate courses ~ up to the individual, no formal postgraduate program in Canada, availability
Perceptions of the principle: the rule of the artery, the artery is supreme, the role of the artery Lack of understanding of the historical context ~ what Still meant, what Sutherland meant, the evolution of the principles Principle of health ~ not used in the same way as osteopathic principles

Lack of understanding of current implied meaning CEO ~ not integrated into undergraduate learning as the other principles are

Vague ~ all fluxes and flows, fluid body versus the cardio-vascular system, the fields

Used as communication means of body ~ Dummer, integration method, fluids are indirectly affected

Physiology ~ oxygen via the blood, nutrients, immunity and blood, drainage via the venous flow, pressures from vessels to global, lymphatics – immunity, protein removal, glymphatics, vasomotion, cranial concept, unknowns

Implications and suggestions for future curriculum

Classification of principles ~ health and osteopathic

Approaches to patient care and treatment methodology, epistomology

Palpation ~ can only know what we feel, knowledge and Sutherland

Evidence based practice ~ how it relates to teaching principles

Context ~ the danger of teaching through quotes

Layering and knowledge

Squirrel in the hole of the tree ~ teaching immeasurables

APPENDIX 9

Interpretative Outline Tool – Analysis

Theory development – finding 1: An overwhelming majority of participants treat the circulatory system, the fluids and the liquids. The majority of participants incorporate the principle, « the role of the artery is absolute » in treatment.

It is possible that the guiding principle does not influence whether osteopaths are treating the fluids and liquids, not all of the same participants voiced that they used the principle. Why? What is actually going on? It is possible that the principle does guide the participants but not in the same way as the others, it is not a direct application but what osteopaths strive for/a treatment aim, normal fluid and liquid flow.

The themes underlying this phenomenon are curriculum content, wording and attitude, and culture and development of osteopathy

Curriculum content

- the curriculum content for graduates before 2011 may be less focused on liquids and fluids than current curriculum.
- The curriculum pre 2011 may have been that the concept of fluid pathways that needed to be keep free and flowing. This was via the alignment of structure in the muskuloskeletal system and fascial systems, as well as vertebral lesions which impacted the nervous system and corresponding viscera and vice versa.
- To present, there are few direct osteopathic treaments for vascular tubbing in the curriculem of the undergraduate program.
- Perhaps because the participants learned the principle in undergraduate studies they continued the quest for its teachings post grad. More likely it was the spasm work and philosophy of Philippe Druelle.

Wording and attitude

- The phrase is very similar to the rule of the artery is absolute which is taken from a longer quote from Still. The word role and rule both require understanding of intent. (ie. Role: more than one function and Rule: follows normal physiology)
- The principle is taken from a larger quote but the larger quote and its meaning may not be known
- The principle wording is clearly paying tribute to Still who lived in a time when the medical landscape was quite different in some ways but also similar in some respects. Osteopaths' perspectives on keeping the practice current may influence their attitude toward this principle
- Different interpretations of Still's work. Reading Still's works is not a requirement of the undergraduate program, it is a suggested reading. Participants are not Still scholars unless they chose to become so of their own volition

Culture and development of osteopathy

- Many other colleges do not use the principle as a guiding principle. They often use a principle that indicates a combination of the other three principles is used in treatment. The principle, the role of the artery is absolute, also uses the other three principles to achieve the goal of freeing fluid and liquid pathways
- Many post-graduate courses are being offered that use direct tools to treat the tubbing/vasculature and fields such as biodynamics.
- Traditional osteopathy was transmitted with a hands on approach in order to teach the required palpatory skill, the participants indicated that mentorship played a role on their post graduate development. Perhaps the mentorship was needed to acquire the palpation needed to treat this system/body. As well as the undergraduate knowledge.
- Osteopaths are seeking ways to help people who suffer from todays' typical conditions such as chronic states seen in fibromyalgia or chronic fatigue.
- More is now known about injuries such as concussion and post concussion syndrome. More is known about the anatomy and physiology of the brain such as the glymphatic system. Therefore, osteopaths are looking for methods of treatment which reflect this current research and discovery. In the example above, it is the movement of fluids that help decrease the symptoms of concussion. As P1 said of her acute patients complaining of headaches.
- The osteopathic culture on Canada is unique? It seems so, as the findings from Jane Starks' thesis found that participants weren't treating the liquids and fluids.

Experts were interviewed, another study of interest would be a survey representative of all Canadian osteopathic manual practitioners and whether they treat fluids and liquids. This would indicate if Canadian osteopaths are unique as a group.

Literature shows that influencial osteopaths such as Frymann, Daraillans, Jealous address the fluids and liquids.

<u>Theory development – finding 2:</u> An overwhelming majority of participants use indirect techniques and the majority of participants assess and treat the fluids and liquids directly via the vascular tree, the tubing, and the flow.

Participants use a combination of techniques/methods to achieve free unobstructed flow. Although there aren't many direct vascular techniques taught in the undergraduate curriculum, still a majority use direct techniques. Why?

The underlying themes are: post graduate culture and CEU requirements, quest for more efficient tools for treatment, quest for measureable tools, quest for ways to conceptualize homeostasis.

Post graduate culture and professional association requirements

- A certain numer (check) of CEUs are required to maintain membership in (name) osteopathic association(s).
- The CEO and CCO provide two symposiums per year where members can fulfill these requirements and network with international osteopaths.
- The focus of these symposiums are reflexive of the values and interest of the Philippe Druelle and other influencial teachers from the school. Therefore, if they are interested in this work, then they might invite people who also share this interest such as Bernard Daraillans, etc.
- The traditional osteopathy has been stated to be important. This past year the CCO offered a course in the history of osteopathy (check exact title name). In post graduate culture, further knowledge of osteopathic history has a place of interest.
- Half of the participants are from Quebec and by proxy work close to Philippe Druelle and therefore may be more influenced by his knowledge than an osteopath who rarely sees him.

Quest for measureable tools

- The literature suggests that there are some osteopathic communities internationally who are valueing measureable tools so that osteopathy can keep pace with an evidence based medical and healthcare landscape. Direct tools are potentially more measureable. With indirect tools, it is often a combination of techniques that lead to a result of improved vitality where we therefore assume a change in fluid or liquid flow but we don't know exactly which mechanism –if there was a one- which released the flow.
- Measureable tools may provide more instant feedback thereby increasing the efficiency of the practitioner and confidence.
- Measureable tools allow for increased dialogue between healthcare practitioners of different disciplines as each other gains understanding of conclusions or hypothesis found.

Quest for ways to conceptualize

- Osteopaths seek to conceptualize the dynamic process which is our beings. Biodynamics or biokenetics may fill a need for practitioners to conceptualize the body or the being as it relates to the person. Osteopaths don't seek recipe cards they seek

concepts which allow them to see the individual within a concept of dynamic processes. The techniques explore ways to treat within a larger concept.

- Do the principles provide ways to conceptualize? How do the participants conceptualize? Some said biodynamics, biokenetics, but on the whole it appears they use a combination. There is no One way. Therefore, they use different techniques, this is a reflection of their own dynamism and responsiveness to what is at present in front of them at the time of treatment.
- Are the principles enough to give us a means to approach the body or the being in front of us. Some institutions –Dummer and AOA have developed ways to approach the body via systems with their related techniques.
- Some participants expressed a sense of joy and elation at discoveries in treatment of the vascular system. It is a basic human joy to make discoveries.

<u>Theory Development – Finding 3:</u> No participants felt that they learned how to directly treat the liquids and fluids in their undergraduate osteopathic studies. Over half of the participants learned primarily from a mentor postgrad.

Although no participants said they learned how to treat the fluids and liquids in undergrad, most still learned. Why? What is the nature of learning osteopathy? What is the progression of palpation learning?

The underlying themes are: layers of learning, palpation teaching and learning, learning environment, learning in a class versus with a mentor, different doors

Layers of learning

- Learning happens in stages and we learn differently. Osteopathy is unique in that the palpation demands are higher than other manual therapies. How do we learn something we haven't felt. One progression is that we feel it before we inquire as to what it is. There is an element of belief. How can something be so if we can't see it or hear it or feel it. If we don't feel it first do we really learn it or does the shadow of doubt prevent it. How do we remain open to feeling it on the other hand. Darraillans says his methodology evolved at the same time as his conscience knowing.
- Guiding principles as learning tools remind us that as we learn, these concepts guide the conceptual picture. We are reminded in our self study, in the clinic room of the elements from the different concepts. One participant identified that experience in the clinic was their primary tool to learning. Several participants indicated that either they didn't feel it so they didn't incorporate the principle but once they felt it they did incorporate it. One of these participants indicated that once they felt something they couldn't identify they then went to a mentor who could help them to identify. This cannot be learned in books. The principles still quide the self study for some participants; their stories were of a palpatory evolution and discovery via palpation. The role of the artery may have served as a reminder that there is more beyond the structural and fascial bodies which so often serve as the initial doors through which we enter.
- Time is necessary to learn multiple fields and bodies. Time and practice is essential when navigating them. One participant suggested that it is better to know a couple really well before adding more systems. He suggested that Still often discussed the notion of normal and the need to know normal in order to know abnormal. It takes time to treat the required number of people to know normal. Learning therefore cannot be fast if this knowing through palpation must occur which gives wisdom and knowledge.

Palpation learning and teaching

- Several of the participants indicated that improvements in the level of palpation needs to be improved for current students. Could they be recalling a time when a mentor helped them and that really changed their ability to palpate new bodies/systems/tissues/states? One of the participants said that if they could have smaller classes with more hands on time, students would learn better palpation skills.

- Teaching palpation has to be accompanied with theory. One participant said that it was good to introduce it with the lymphatics course and the palpation of protocol 2. The theory and palpation are then introduced simultaneously.
- Some participants suggested that the principle should be taught from the very beginning and the fluids and liquids should be introduced right away. Perhaps because it takes so long to wrap our heads around all the different layers.

Learning environment and culture

- The undergraduate experience is now compiled of hours of classroom learning, classroom guided practice, and clinic time. The experience before 2011 would not have had clinic experience. The environment for learning may have influenced the participants' ability to practice their learning in the field with a guide, aka supervisor to validate palpation finds. The element of discovery sticks in the mind. In clinic, when you are confronted by something you have never felt before, the supervisor can explain what it is and whether it is normal or abnormal and why. This kind of learning, as it is grounded in discovery may help to speed along the palpation learning experience and have a more profound effect.
- Introducing possibilities of palpation before students have the palpation skill is a means to showing potential – if or however the student pursues it is their choice
- Having access to expert osteopaths seems essential, how else will osteopaths really develop and validate their palpatory queries
- Inspiration must have come through some means. The desire to do more, learn more, discover more, be open to more must have been there for the participants otherwise they wouldn't have sought out such a challenging endevor post graduate. Yes, some said authors and a couple said self learning. Inspiration comes from? Culture? Personal drive? Knowing the possibilities?
- In most cases, participants all attended over twenty conferences. This indicates that they are a group who are motivated to be a part of a community and/or have a desire to be a lifelong learner. Still himself was a lifelong learner in so many fields. He embodies this spirit.
- The participants are or were all affiliated with the college in some way. A college who hosts two symposiums a year. Other colleges internationally are not all focusing on the fluid body. The participants are a group affiliated with the college, this and their opinions expressed suggest that as a group thay are interested in education.

Different doors

- One participant said that he didn't feel that everyone needs to learn at the same pace or in the same way to have the same outcome. That it is not necessary to know all fields and bodies/mechanisms in order to be effective. Do students need this flexibility in order to find success with their personal development and with their patients. The body may use them as a fulcrum regardless if they know what they are doing.
- Mentorship was a means by which half of the participants learned. Is there a means by which students or recent grads can have access to mentorship outside of the community of Montreal and Toronto who have fostered this.
- Will therapists seek out the mentor they are meant to find? Is there a culture of seeking out mentorship post graduate?

<u>Theory development – Finding 4</u>: The majority of participants use the concept of the long tide or biodynamics as an integration tool.

The necessity to communicate via the fluid field (or other fields) systemically was of importance to the majority of participants. Why ? The integration of the treatment in a local or regional area needs to be integrated with the whole body, person, being.

The underlying themes are: undergraduate teachings to graduate teachings; body and person, the role of the artery is absolute, ultimately we treat the person, person and environment and flow – can the person flow in their environment

Undergraduate teachings to graduate teachings; body and person

- The CEO teachings include, at a minimum, the importance of preping the tissue to improve palpation and facilitation of correction, treatment to realign tissues, and integration at the local, regional, and global levels; addressing vitality may occur at any stage of treatment. The global integration in the beginning is generally limited to the body. Later, the teachings include integration with the person. The leap from body to person appears to happen via the fluids and the fields. The researcher is limited in knowledge in this respect. Regardless, it is evident that the participants use fluid based methods for integration.

The role of the artery is absolute

- Whether participants say they are integrating the principle or not does not necessarily reflect what they are actually doing. The original concept is from Still in that the goal is to free arterial blood flow to a normal rate. Then there is an acknowledgement that the arterial blood flow does not act as the ultimate fluid driver, rather the fluids are a dynamic system that works towards homeostasis at many levels – cellular to systemic, with many controlling and contributing factors in relationship to the environment. Evidence from the interviews depicts a group of participants who incorporate this concept at some level. This is irregardless of their attitudes towards the wording or existence of the principle.
- Is the role of the artery is absolute the same as saying that rationale treatment is a combination of the other three principles? Yes, because the principle of autoregulation includes fluid and liquid flow. No, because the emphasis is different.

<u>Theory development – Finding 5:</u> The majority of participants believe the principle is grounded in Still's work and know the wording was changed but they are not sure by whom.

The participants displayed competent knowledge of the history of the principle. Why don't they know where or how the wording changed? What are the factors involved behind this data?

Underlying themes are: Reading Still, historical documentation and availability of material, culture of doing versus research

Reading Still

- The participants, in many cases, voluntarily indicated that they had read Still. Not all of his books but at least were familiar with his teachings enough to cite examples. This indicates that the participants know, from a primary source, that Still was interested in using blood flow to restore health and that was a key concept in his work.
- A couple of participants knew enough of Still's writings to know that he explained the concept rather simply, in comparison with the current interpretation of the role of the artery is absolute.
- All but one knew that the wording was changed, so they knew enough of Still's writings to know that this had occurred.

Historical documentation and availability of material

- There is no history of osteopathy taught as a course at the CEO. An introduction in the GOT course does exist that provides the student with basic knowledge of Still and the Kirksville school. A few other pioneers of osteopathic concepts are discussed such as the fulcrum, Sutherland, Viola Frymann, etc.
- Many authors who published texts that influenced the evolution of principles are out of print and are expensive or hard to find.

Culture of doing versus research

- Traditional osteopathy does not lend itself to evidence based research. The outcomes are not measureable and are often subjective.
- Osteopaths do not treat pathologies with a recipe card. Every person is seen as an individual requiring an individual treatment. Even if some of the techniques are similar or the causes become known, the approach is individualised. The tissue tells the osteopath the correct door to use to gain access. This does not lend itself to evidence based medical research that is the current trend.
- The diploma program at the CEO is not yet recognized by a Canadian University. The majority of participants do not hold masters or PhD level degrees in Osteopathy specifically. Those that do, acquired them in other countries. Postgradute inquiry is self-directed.

<u>Theory development – Finding 6:</u> Only a few participants clearly demonstrated their understanding of the principle to include all flows and fluctuations of fluids and liquids.

Participants expressed better knowledge of Still's concept than of the role of the artery is absolute. Why?

Underlying themes: Undergraduate education, self-directed inquiry, teaching, value of principles

Undergraduate education

- Participants did not display clear comprehensive understanding of the principle the role of the artery is absolute. Some thought its meaning was as Still described in his concept of blood flow.
- The principles are listed and described in the student guide but a lot of material is given to students in the early courses.
- The principles emerge through the teaching but may not always be identified.
- The undergraduate education has evolved since the participants were students.
- A couple of participants thought the principles could be taught better.

Self-directed inquiry

- Reading Still's works is easy to obtain
- Finding when and why the word role was changed to rule is not easy to find
- Inquiry is self directed, few courses exist on the history of osteopathy until recently (Jane Stark – Toronto conference 2016)

Teaching

- The researcher does not have documents that would be given to teachers as teaching aids.
- The researcher does not know what teaching education the teachers are given prior to teaching other than that the Toronto teachers are required to assist for three years prior to teaching the course themselves. This suggests that the information comes by means of a mentor. If the mentor doesn't value the principles, then there is a chance the new teacher will not unless self-directed otherwise.
- The principles are emergent in the teaching methodology

Value of principles

- Much discussion in the literature debates what the principles should be. But the artericles are published mostly from a call to papers, so these are from people interested in the principles. The trend is to certainly have approaches to patient care and ethics of care. The discussion of distinctiveness arises and can be debated via principles.
- One participant suggested that principles dumb it down, that the principles are simple and easy to grasp for students but because most don't inquire beyond the verbatim phrasing, they don't really understand them fully.

- Still did not hand down principles. To understand his concepts you have to read his works in totality. Phrases and quotes are taken and misunderstood or misconstrued. Still made a point of saying that osteopathy isn't easy – you have to study the anatomy and physiology to have a living picture under your hands, you have to treat many many to know the difference between normal and not normal.
- There is a value of principles at the teaching/learning level and also at the debate to define osteopathy. Students need a framework to help orient themselves when embarking on a new way of thinking and conceptualizing treatment and health. Most come from a background of physio, massage therapy, chiropractic, kinesiology, etc. The thinking is markedly different to the traditional osteopathy. Principles help to orient students on a new path. But again, the principles are largely emergent. The other three principles may be reiterated more often because they are more directly applied.

<u>Theory development – Finding 8:</u> Only a couple of participants expressed that they like the wording of the principle the way it is.

The wording of the principle has implications for application and passing down of information. If attitudes are negative towards the wording, will the concept be passed down? The wording of the principle was problematic for many participants, why?

Underlying themes are: teaching with quotes, value of principles, variations on a quote, learning through principles

Teaching with quotes

- A current trend, possibly due to electronic accessibility to information, is that students are not required to seek out full texts. They are learning through quotes extracted from larger works.
- Students at the CEO are not required to read full historical texts related to osteopathy.
- If students are not required to read the full text, they rely largely on the interpretation of the information presented by the instructor. If the instructor does not know the full history and context behind the quote, the original meaning is lost in the transmission.
- Even if the instructor knows, the teaching style may not facilitate learning for all students and the transmission is lost.
- Negative attitudes from the teacher will be passed to students if students do not research and study the primary source

Value of principles

- If partcipants care enough to state an opinion about the wording, they value the existence of principles.
- Should principles define a distinct entity. The principle defines health at face value. If you understand the complete history it also defines osteopathy. The goal of alignment is to free pathways not to decrease symptoms. This is fundamentally different to other models of manual therapy. It is where that essential link lies in the ultimate goal of uniting the treatment with the physiology and the person so that nature can do the rest; the body has an inherent system of autoregulation.

Variations on a quote

- Using a quote and then changing the wording only slightly may be problematic. One participant with english second language didn't recognize the change in the wording and thought it was written by Still verbatim.
- Learning new material can be overwhelming, clear wording can facilitate efficient learning. The wording of the principle is steeped in history. Learning traditional osteopathy is not easy. The history of the change in the wording is not taught necessarily. Students may think it was said by Still. Students may not understand that the meaning is not limited arterial flow.

Learning through principles

- Principles give a framework for learning. Understanding the principle is important for attitudes towards incorporating new information. If the understanding is not there, the

student may be dismissive of the concept thereby blocking efficient learning of new concepts or methodology.

- The wording in the phrase suggests a simple concept but the meaning is both simple and very complex in its application.

<u>Theory development – Finding 8</u>: Many participants either felt that techniques to treat fluids and liquids needs to be improved or that the teaching of the principles needs to be improved at the undergraduate level.

This opinion was not expressed by a majority and was not elaborated on in great detail. However, it ties in with the voice that calls for better palpation.

Underlying themes: Undergraduate education and curriculum, palpation

Undergraduate education

- Class size effects the ability to validate hands on learning
- A very large course content, heavy on techniques, may result in less focus on principles
- Exam content, if not focused on principles, will not encourage this focus
- Palpation of Protocol 2 occurs in the lymphatics course, midway through the program. After this, the program shifts to more visceral palpation and treatment. There aren't many direct techniques that target the vascular system – P1 or P2

Palpation

- Class size directly influences the skill level that palpation can be taught if class sizes are too large.
- Moving between P1 and P2 and retaining the rules for each is a skill that needs improvement – as one participant voiced

<u>Theory development – Finding 9:</u> Participants did not feel like they actively applied the principle in cases of pathology. Participants did find that, for certain pathophysiological states there was a direct relationship with outcome success with liquid and fluid flow treatment.

Participants would not say that they always incorporate the principle or always treat the liquids and fluids in certain pathologies, one participant said that would be non-osteopathic. However, some pathophysiological states did respond to fluid and liquid treatment specifically.
The very long list of pathological states where treating the fluids and liquids might be the real area of interest in this finding. Why? The osteopaths are voicing the traditional osteopathy where the goal of freeing fluid and liquid pathways is always an essential goal in treatment.

Underlying themes: Methodology, pathophysiological states that respond to fluid and liquid work, the role of the artery is absolute, approach to patient care and treatment

Methodology

- No recipe card in osteopathy – Cotton and Paulus would agree
- How the osteopath preps the tissue or person is unique just as the treatment is and order of treatment is
- The osteopath seeks to find a communication with the tissue
- The osteopath seeks to ensure that all systems are on and communicating with each other

Pathophysiological states that respond to fluid and liquid work

- States where congestion or edema is causing the symptomatology
- States where compression of neurovascular bundles due to edema is causing symptom picture
- Cranial

The role of the artery is absolute

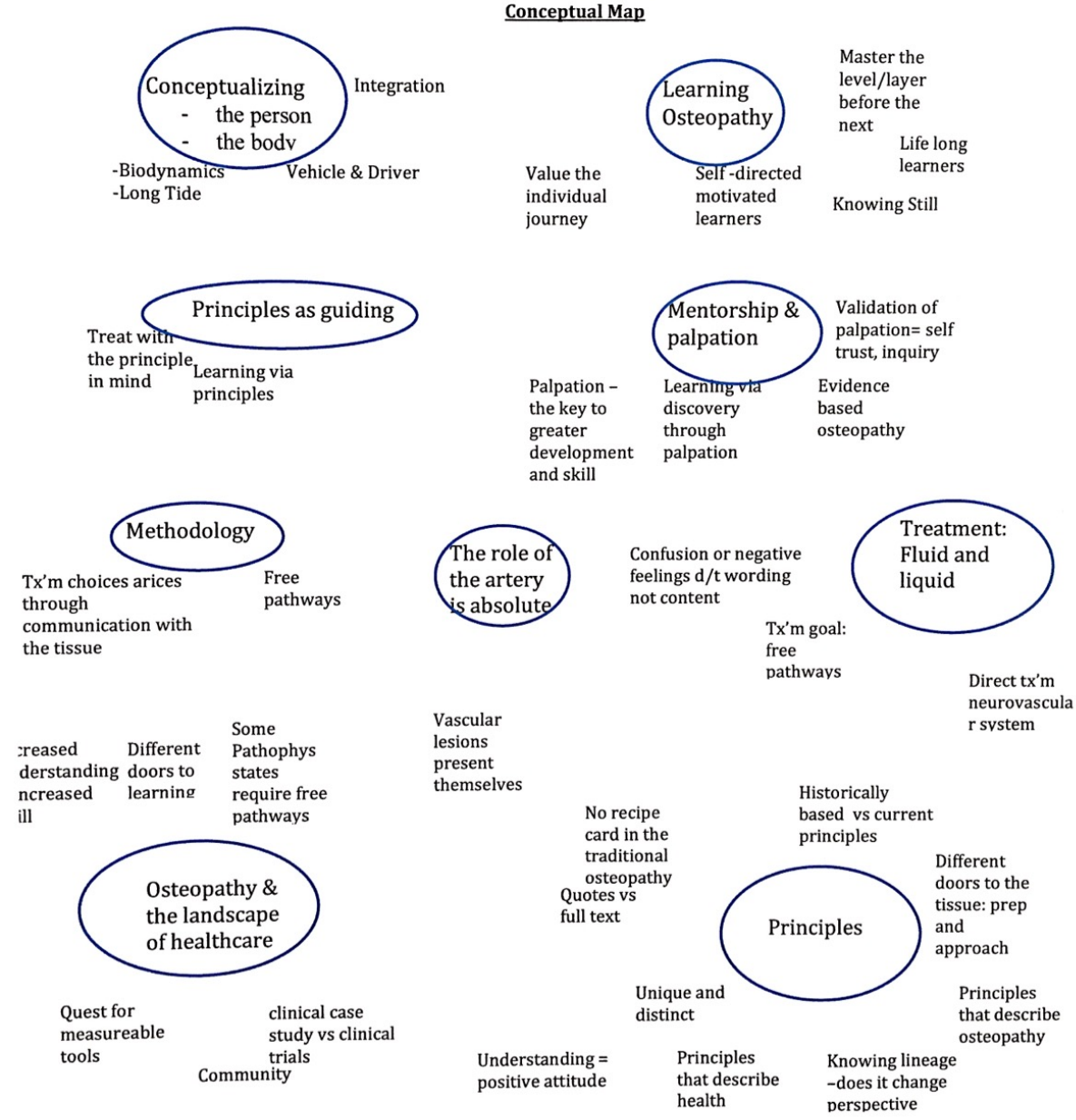
- The goal to free pathways for uninterrupted flow is in the minds of osteopaths while they assess and treat

Approach to patient care and treatment

- Osteopaths seek to communicate with the tissues and facilitate a shift towards normal; they do not force techniques on the tissue
- The use of fluid and liquid work in prep can facilitate palpation and increase vitality
- It is essential to treat the vehicle and the driver or with the driver in mind, it isn't enough to treat the body; fluid and liquid work can be that bridge
- Fluid and liquid pathways need to be free, there are many direct and indirect ways of accomplishing this.

APPENDIX 10

Conceptual Map



APPENDIX 11

Consistency of Findings, Interpretations, and Conclusions

Findings	*Interpretations*	*Conclusions*
1. An overwhelming majority of participants treat the circulatory system, the fluids and the liquids. The majority of participants incorporate the principle, « the role of the artery is absolute » in treatment. (Based on RQ1)	The concepts in the principle, the role of the artery is absolute, are key to distinguishing traditional osteopathy Principles are not the only guiding factor in postgraduate learning, culture and community matter Traditional osteopathy is distinct on the landscape of osteopathy and healthcare Principles do help guide practitioners Expert Canadian osteopaths are grounded in the traditional osteopathy Expert Canadian osteopaths value traditional osteopathy and are not compromising it just to fit in to more easily measured treatment	A great deal of weight is placed on principles but they alone do not foster a field's breadth of work. Traditional osteopathy encompasses Still's teaching that for the body to optimize its immunity, the fluids have to flow on time and in quantity sufficient and expert Canadian osteopaths do know that. Traditional osteopathy is challenging to measure but the outcomes outweigh the desire to reduce the practice to purely structural alignment and symptom relief.
Recommendations Expert Canadian osteopaths should seek to (or continue to) document, research and publish their work and recognize that their work may be unique and valued. Expert Canadian osteopaths should (or continue to) teach at the undergraduate and postgraduate levels or take part in mentorship programs.		
2. An overwhelming majority of participants use indirect techniques and the majority of participants assess	There are no direct techniques for the fluids, treating the vessel is not treating the fluids directly Nature does the rest, active structure alignment to passive	For a principle to exist, does it need to be measured by direct manipulation? This questions the content of principles; do they directly

and treat the fluids and liquids via the vascular tree, the tubing, and the flow. (Based on RQ1,3)	observation in biodynamics Expert Canadian osteopaths see the vascular tree as a component that could potentially disrupt flow, correction of other tissue is not enough The palpation of the vascular tree is unique, the osteopath does not always seek its correction, but the vascular tree comes into the hands of the osteopathy	need to be applied to be valid. The primary goal of treatment is to facilitate normal flow of fluids.
Recommendations Clarification is needed to define treatment and palpation of the vascular tree because it is unique to other structures. Clarification of the application of the concepts within the principle, the role of the artery is absolute is needed.		
3. No participants felt that they learned how to directly treat the liquids and fluids in their undergraduate osteopathic studies. Over half of the participants learned primarily from a mentor postgrad. (Based on RQ5)	Learning to treat the fluids takes practice and skill because the palpation is unique Learning to treat the fluids was not a focus in curriculum until more recently Learning to treat the fluids may be best learned from a mentor Mastering one level of palpation before learning another is helpful The participants are self-directed lifelong learners Undergraduate work may not fully prepare the student to work as the traditional osteopath but the door is opened for those on the winding path	Learning osteopathy is a lifelong learning and much is learned through experience with necessary validation from a mentor. The undergraduate experience does not fully prepare the osteopath because the necessary practice to achieve palpation skills outlives it. However, because the culture of mentorship exists, osteopaths may continue to grow their practice. Students and recent graduates need support, feedback and palpation guidance from mentors. Recognizing that each individual does not learn osteopathy the same way values the individual

		journey.

Recommendations

Mentorship and continuing education courses need to occur at satellite campuses.

Traditional osteopathy should always be viewed as a lifelong learning journey.

Individual approaches to learning osteopathy should continue to be valued.

4. The majority of participants use the concept of the long tide or biodynamics as an integration tool. (Based on RQ1,3)	Expert Canadian osteopaths are valueing the concept of wholeness and the person Expert Canadian osteopaths follow the lineage of Still, Sutherland, Becker, Wales?, Druelle, and Jealous for integration Expert Canadian osteopaths value integration over fitting in with todays' model of evidence based medical research (clinical trial research) Expert Canadian osteopaths are motivated self-directed lifelong learners	The fundamental value of treating the person and not just the body is a key insight in traditional osteopathy. The fluids are the means by which this is facilitated.

Recommendations

Teaching at the undergraduate level needs to continue to demonstrate all levels of treatment possibilities beyond the level of the student. This will open the door to curiosity and inspire the curious student to attend postgraduate courses and seek out mentorship relationships.

Recognition that the student is ultimately treating the person and not just the body is crucial to grasp in traditional ossteopathy. The tools to achieve this need to be continued to be introduced.

5. The majority of participants believe the principle is grounded in Still's work and know the wording was changed but they are not sure by whom.	The historical lineage of principles is not well known The change in wording does not result in better comprehension/more knowledge Expert Canadian osteopaths are	In this age of readily available information, historical osteopathic documentation falls short. If the osteopathy that is taught at the CEO is grounded in historical roots, that information

(Based on RQ2)	familiar with Still's writing	needs to be more readily available. The teaching of the principles needs to be taught as is it, emergent through the methodology, but also it needs to be clarified and explained.

Recommendations

The lineage of the principles should be detailed in the descriptions of the principles.

6. Only a few participants clearly demonstrated their understanding of the principle to include all flows and fluctuations of fluids and liquids. (Based on RQ1,2)	The teaching of the principle needs to be improved The wording does not lend itself to full comprehension	The breadth of meaning needs to be expressed in the wording of the principle. The wording of the principle does not need to be taken from a quote from Still because Still did not leave us with principles.

Recommendations

Expert Canadian osteopaths should take part in a focus group discussion regarding the content and wording of osteopathic principles. All principles work in coordination with one another, it is not enough to review just one.

7. Only a couple of participants expressed that they like the wording of the principle the way it is. (Based on RQ2, 5)	The wording does not lend itself to full comprehension What the wording should be in unknown if the full meaning is to be expressed The role of principles is open to debate The need for external validation must play a role in the principle wording The wording should reflect many levels of practice, basic to master	Same as above The teaching of the principle should reflect that it is a treatment aim as opposed to a concept that is directly applied as this would reduce confusion. Given the precarious place osteopathy holds on the landscape of healthcare, more attention needs to be placed on principles, approaches to treatment and patient care, epistomology, standards of practice, curriculum, and ethics. As in other

		disciplines, these represent a course unto themselves.
Recommendations Same as above		
8. Many participants either felt that techniques to treat fluids and liquids needs to be improved or that the teaching of the principles needs to be improved at the undergraduate level. (Based on RQ5)	Participants value education Participants value the principles as learning and teaching guides Participants value traditional osteopathy Participants recognize the fluids are an important component in health and vitality	Principles need to be clearly taught when the student is not overwhelmed with information. Therefore, introducing them in the first course is not sufficient. As with methodology, principles need to be taught and demonstrated throughout the course of undergraduate study. The palpation and treatment of fluids is unique. Clear concepts within this field are essential to comprehension.
Recommendations Principles should be more emergent in curriculum. Mentorship in palpation should be a component to the mentorship program currently being supported at the college. Students should seek out mentorship relationships. More clarity is needed surrounding the work of the fluid body.		
9. Participants did not feel like they actively applied the principle in cases of pathology. Participants did find that for certain pathophysiological states there was a direct relationship to	Traditional osteopathy is best measured by outcomes Expert Canadian osteopaths do not use a recipe of treatment sequences Every person is unique and are not viewed as a pathology or case Expert Canadian osteopaths look for the cause with the whole person	The CEO is continuing to strive toward the first university program in osteopathy. Alternative ways to validate outcomes must continue to be a component in education and research. Osteopathic approach does not and should not try to fit into

outcome success with liquid and fluid flow treatment. (Based on RQ4)	in mind Symptom pictures that arise from fluid based obstruction respond well from freeing the obstruction or facilitating flow and drainage. Participants apply the teaching of the principle	the current trends in evidence based research but should value valid outcome based research.

Recommendations

Expert Canadian osteopaths should seek to (or continue to seek to) publish their research in order to demonstrate that traditional osteopathy is unique within the greater field of osteopathy and health sciences. This will prevent the possibility of osteopathy being seen as too similar to other manual therapies and thus preserve the field from becoming obselete.

Canadian osteopaths should seek ways to validate outcome based studies.