

Court of Queen's Bench of Alberta

Citation: Dickson v. Pinder, 2010 ABQB 269

Date: 20100420
Docket: 0403 02817
Registry: Edmonton

2010 ABQB 269 (CanLII)

Between:

Patricia Dickson and Her Majesty the Queen in Right of Alberta

Plaintiffs

- and -

**Ross J. Pinder, Jaime Cervantes, Capital Health Authority Operating a Facility Known as
the Fort Saskatchewan Health Centre, Jane Doe #1, Jane Doe #2, Jane Doe #3**

Defendants

**Reasons for Judgment
of the
Honourable Mr. Justice K.D. Yamauchi**

| | | |
|----|--|--------------------------|
| 1. | Introduction | Page: 3 |
| 2. | The Parties | Page: 4 |
| 3. | Liability in Tort for Medical Negligence | Page: 5 |
| 4. | Negligence | Page: 5 |
| | a. Whether Dr. Pinder owed Ms. Dickson a legal duty of care | Page: 5 |
| | b. Whether Dr. Pinder breached the standard of care that he owed to Ms. Dickson | Page: 5 |
| | i. a chiropractor's standard of care | Page: 6 |
| | ii. informed consent - evidence | Page: 6 |
| | A. the pre-treatment consultation | Page: 6 |
| | B. expert testimony on chiropractic informed consent practices | Page: 11 |
| | iii. informed consent - legal principles | Page: 15 |
| | A. risks that may result from treatment | Page: 16 |
| | B. alternative treatments to the proposed therapy | Page: 19 |
| | iv. informed consent - analysis | Page: 21 |
| | A. failure to identify and characterize the risk of a stroke being caused by SMT | Page: 21 |
| | I. relevance of the Informed Consent Form | Page: 21 |
| | II. Dr. Pinder's direct consultation with Ms. Dickson | Page: 22 |
| | B. alternative remedies | Page: 26 |
| | v. did an absence of informed consent lead to the SMT treatment? | Page: 26 |
| | A. legal principles | Page: 27 |
| | B. Ms. Dickson's testimony | Page: 28 |
| | C. analysis | Page: 28 |
| | vi. informed consent - conclusion | Page: 29 |
| | vii. negligent treatment | Page: 29 |
| | A. party testimony and expert evidence as to the consultation and therapy | Page: 29 |
| | B. analysis | Page: 33 |
| | I. diagnosis and record taking | Page: 33 |
| | II. the SMT | Page: 35 |
| | viii. conclusion in relation to negligence | Page: 37 |
| 5. | Whether Ms. Dickson Suffered an Injury or Loss | Page: 37 |

| | | |
|----|--|--------------------------|
| 6. | Whether the SMT that Dr. Pinder Performed was the Actual and Legal Cause of Ms. Dickson’s Injury or Loss | Page: 37 |
| | a. The Nature of Ms. Dickson’s Injury | Page: 37 |
| | b. Expert Testimony | Page: 38 |
| | i. chiropractic neck treatment and strokes | Page: 38 |
| | ii. epidemiological correlation of chiropractic therapy and strokes | Page: 39 |
| | iii. biomechanical characteristics of vertebral arteries | Page: 44 |
| | iv. Ms. Dickson’s alleged injuries | Page: 47 |
| | A. Dr. Ashforth | Page: 47 |
| | B. causes of arterial dissections | Page: 48 |
| | C. alleged vertebral artery dissection in the neck | Page: 49 |
| | D. alleged intracranial artery dissection | Page: 51 |
| | c. Causation - Legal Principles | Page: 54 |
| | d. Analysis | Page: 57 |
| | i. epidemiological evidence | Page: 57 |
| | ii. biomechanical analysis of the risk of SMT | Page: 59 |
| | iii. risk factors | Page: 59 |
| | iv. timing of the SMT therapy and the stroke | Page: 61 |
| | v. features of Ms. Dickson’s injury and circulatory system | Page: 62 |
| | A. the intracranial V4 abnormality | Page: 63 |
| | B. the ‘flap’ abnormality in the V1 / V2 region | Page: 64 |
| | C. conclusion - observations of Ms. Dickson’s left vertebral artery | Page: 64 |
| | d. Causation - Conclusion | Page: 64 |
| 7. | Costs | Page: 65 |

1. Introduction

[1] Patricia Dickson was suffering from neck pain and a headache. Ray Maschmeyer, the owner of the land on which she and her husband were living, suggested that she make an appointment to see Dr. Ross J. Pinder, a chiropractor. She attended Dr. Pinder’s office on February 14, 2002. Dr. Pinder manipulated her neck using spinal manipulative therapy (“SMT”). Ms. Dickson heard a crack or popping sound. Although the original pain resolved itself, she felt a different pain. Ms. Dickson made a further appointment to see Dr. Pinder and returned home. Later that evening she went to play bingo. After retiring to bed for the evening, she awoke at approximately 1:45 a.m. with a searing pain behind her left eye. When she stood up, she was dizzy and perspiring profusely. She testified that her left eye was “jumping up and down.” She and her husband immediately went to the emergency room at the hospital in Fort Saskatchewan, Alberta.

[2] Ms. Dickson had suffered a stroke. She alleges that the SMT caused her stroke. The bases of her claim are that Dr. Pinder failed to obtain her informed consent to the SMT and that he negligently performed the SMT on her.

[3] Dr. Pinder's liability for negligence is the only issue before this Court. Damages are not in issue.

2. The Parties

[4] The parties who remain the subject of this lawsuit are Dr. Pinder and Ms. Dickson.

[5] At the time he treated Ms. Dickson, Dr. Pinder had been a practising chiropractor for about 27 years. He graduated from Palmer College of Chiropractic in 1975 and practised in Edmonton, Alberta for the first three years of his career. He purchased a Fort Saskatchewan, Alberta chiropractic practice in 1978 and has practised there ever since. Dr. Pinder's primary practice involves SMT.

[6] Ms. Dickson was raised in Fort Smith, Northwest Territories by her adoptive parents. She was adopted when she was a few days old. She did not meet her biological mother until about seven years ago.

[7] Ms. Dickson moved to Slave Lake, Alberta when she was 21 years of age, and lived there for about 13 years. During that time, she met the man who would become her husband and they married in 1991. Ms. Dickson and her family relocated in Alberta a number of times, living in Slave Lake, Calgary, Sundre, Ponoka, Whitecourt and, ultimately, Bruderheim. She has worked in retail, the service industry and manual labour occupations, the latter of which involved heavy lifting. At the time of her visit with Dr. Pinder, she was working seasonally at a gravel pit operating weigh scales.

[8] Ms. Dickson testified that she had difficulty with mathematics and English. She completed grade nine, then dropped out of school. As an adult she attended the Adult Vocational Training Centre in Slave Lake to take basic upgrading. Later, she challenged the General Educational Development ("GED") test, which would provide her with her high-school equivalency. She testified that she had difficulty with the English portion of the GED, so she had her English teacher assist her. While she and her family lived in Ponoka, Ms. Dickson was accepted into a counselling course that the Samson Band sponsored. She did not complete her first year of that course because her field placement was at Alberta Hospital in Ponoka and she did not feel qualified to do this type of work.

[9] At the time of the trial, Ms. Dickson was 50 years old. She acknowledged that she is overweight and was so at the time that she saw Dr. Pinder. She is five feet four inches tall and weighs somewhere between 275 and 300 pounds. She testified that she has weighed about this much since she was a teenager.

[10] Ms. Dickson smoked cigarettes at the time she visited Dr. Pinder and continues so to do. There was some dispute as to how much she smoked. Ms. Dickson denied that she was a smoker because she smoked only one or two cigarettes per week. She had a package of cigarettes in her purse on the day she testified and her medical charts, for which she provided the information, stated that she smoked anywhere from one package per day to one package every two weeks. She acknowledged that she has smoked a small number of cigarettes from the time she was 16 or 17 years of age.

[11] Her medical charts also show that she periodically suffered from headaches.

3. Liability in Tort for Medical Negligence

[12] Liability for medical negligence involves a number of issues. Ms. Dickson has the onus of proving on a balance of probabilities that:

- (1) Dr. Pinder owed her a legal duty of care;
- (2) Dr. Pinder breached the standard of care that he owed to her;
- (3) She suffered an injury or loss; and
- (4) Dr. Pinder's conduct was the actual and legal cause of her injury or loss.

Ellen I. Picard & Gerald B. Robertson, *Legal Liability of Doctors and Hospitals in Canada*, 4th ed. (Toronto: Thomson, 2007) at 212 (“Picard & Robertson”)

[13] Ms. Dickson must prove all of these elements, Picard & Robertson at 212; *Waaip v. Alberta*, 2008 ABQB 544, 95 Alta. L.R. (4th) 167 at paras. 29-30. As well, Ms. Dickson must prove these elements sequentially, in the sense that her failure to prove one of the elements, in the order in which this Court examines them, will obviate the necessity for this Court to examine the subsequent elements, see *e.g. McArdle Estate v. Cox*, 2003 ABCA 106, 13 Alta. L.R. (4th) 19 at para. 25; *Olsen v. Campbell-Jones*, 2009 ABQB 371, 11 Alta. L.R. (5th) 203 at paras. 7-8; *Sicard v. Sendziak*, 2008 ABQB 690, 98 Alta. L.R. (4th) 44 at para. 105; *Epp v. Balaton*, 2003 ABQB 822, 24 Alta. L.R. (4th) 66 at para. 131.

4. Negligence

a. Whether Dr. Pinder owed Ms. Dickson a legal duty of care

[14] Very early during the proceedings, Dr. Pinder conceded that he owed a legal duty of care to Ms. Dickson.

b. Whether Dr. Pinder breached the standard of care that he owed to Ms. Dickson

i. a chiropractor's standard of care

[15] The *Olson* court described the standard of care that Dr. Pinder had to meet as, “the degree of care, diligence, judgment and skill which is exercised by a normal, prudent or reasonable chiropractor under like or similar circumstances and with the same experience and training,” *Olson* at para. 10 [citations excluded]; see also *Penner v. Theobald* (1962), 35 D.L.R. (2d) 700, 40 W.W.R. 216 at paras. 12 -13 (Man. C.A.); *Balcom v. MacDonald*, 2000 BCSC 1426, 99 A.C.W.S. (3d) 873 at para. 91; *Loffler v. Cosman*, 2010 ABQB 177 at paras. 66-69.

[16] Since courts have held that chiropractors are treated like other “medical practitioners,” the principles that relate to non-chiropractic medical professionals apply with equal force to chiropractors, *Heughan v. Sheppard*, [2000] O.T.C. 413 at para. 160 (Sup. Ct. J.).

[17] The Manitoba Court of Appeal in *Penner* at para. 52 made an important observation when it said [emphasis original]:

The standard of skill and care required of a chiropractor does not vary - - it is always that exercised by a careful and competent practitioner, but *the degree of skill and care* required to comply with that standard is conditioned by the actual circumstances of each particular case and those circumstances are infinitely variable.

[18] Like many cases in which a plaintiff alleges medical negligence, Dr. Pinder's standard of care can be broken down into two parts, *viz.*:

- (a) whether he obtained Ms. Dickson's consent to the SMT following his disclosure of the risks SMT entails; and
- (b) whether he met the standard of care when he treated Ms. Dickson.

Hopp v. Lepp, 1980 CarswellAlta 243, [1980] 2 S.C.R. 192 (cited to CarswellAlta) at para. 24.

[19] We must, in this case, examine both of these aspects. On both aspects, Ms. Dickson bears the burden of proving, on a balance of probabilities, that Dr. Pinder breached the requisite standard of care. If Ms. Dickson proves either, then this Court may hold Dr. Pinder liable for her injuries.

ii. informed consent - evidence

[20] The events that occurred before Dr. Pinder treated Ms. Dickson will help us determine whether Ms. Dickson provided Dr. Pinder with her informed consent. Each party testified.

A. *the pre-treatment consultation*

[21] Ms. Dickson testified that before she suffered her stroke, the base of her neck would periodically get very tense and this would give her a headache. She would take a hot shower and allow the hot water to hit the base of her neck. If that did not help, she would place a heating pad on the affected region of her neck and this would often resolve the pain. Before February of 2002, her neck pain did not stop her from working or carrying on with her recreational activities. In the past, when her neck bothered her, she would go and see her family physician.

[22] Before her appointment with Dr. Pinder, Ms. Dickson had never been to a chiropractor. She testified that she had little knowledge of what chiropractors did.

[23] When Ms. Dickson went to see Dr. Pinder, her neck was “knotted up.” She could not recall what she was doing before her neck pain started. When she arrived at Dr. Pinder’s office, Ms. Dickson testified that she felt “rushed.” She cannot recall why she felt that way, but she might have been late for her appointment.

[24] Following her arrival at Dr. Pinder’s office, Ms. Dickson signed a document headed “Informed Consent to Chiropractic Treatment” (the “Informed Consent Form”). She was then escorted to the examination room where she first met Dr. Pinder. She could not recall whether Dr. Pinder discussed the Informed Consent Form with her. In fact, she did not recall much, if any, of the discussion that she had with Dr. Pinder. She acknowledged that they discussed her condition and history (though she does not recall the details of that discussion). She then authorized him to treat her neck with a chiropractic procedure.

[25] Dr. Pinder performed the SMT. After the treatment, Dr. Pinder suggested that Ms. Dickson make a further appointment two or three days hence. Ms. Dickson made an appointment for the next week, as her work schedule prevented her from making the follow-up appointment at the suggested time.

[26] Ms. Dickson did not recall what Dr. Pinder said about the treatment he was going to undertake. However, she testified that had Dr. Pinder made her aware that there were other treatments, like massage therapy, available to her that would not involve “cracking her neck,” she would not have allowed Dr. Pinder to perform the SMT. Ms. Dickson further testified that she would not have consented to the SMT had she known that it could cause serious harm or even death. She also testified that she did not know anything about strokes until she suffered the one that forms the subject-matter of this lawsuit. To her knowledge, she does not have a family history of strokes, although she admitted that she knows very little about her biological parents.

[27] Ms. Reah Mohr was the receptionist at Dr. Pinder’s office on February 14, 2002. Ms. Mohr testified that Ms. Dickson tried to see Dr. Pinder the day before as a walk-in patient, even though her appointment was not until the next day. Ms. Dickson does not remember this earlier attempted visit, but acknowledged that her memory has been impaired since her stroke. This Court accepts Ms. Mohr’s testimony on this point.

[28] Dr. Pinder became aware of the necessity for chiropractors to obtain informed consents from patients in the late 1980s or early 1990s, when the Canadian Chiropractic Protective Association (“CCPA”) advised him so to do from. The CCPA is the insurer for chiropractors.

[29] Except for a couple of matters, Dr. Pinder did not remember his visit with Ms. Dickson. He provided this Court with an explanation of his 2002 office procedures and clinical procedures. This Court has the discretion to recognize his evidence in that regard. The British Columbia Court of Appeal said in *Belknap v. Meakes* (1989), 64 D.L.R. (4th) 452 at 465-66 [citations excluded]

If a person can say something he regularly does in his professional life that he invariably does in a certain way, that surely is evidence and possible convincing evidence that he did it in that way on the day in question.

... [T]here is no reason why habit should not be used as evidence either of negligent action or of careful action, and that habit should be admissible as a substitute for present recollection.

This is a common-sense approach. Individuals who repeatedly engage in certain activities will be hard-pressed to recall an otherwise unexceptional encounter. The very repetition of their activities creates its own form of reliability, provided the individual habitually conducts their activities in the same way in a given situation, *Sicard* at para. 115. In the final analysis, the court must assess the evidence as a whole to determine whether it is satisfied that the medical practitioner applied their “invariable practice” in the case involving the *particular patient* with whom the court is dealing. Otherwise, any evidence of habitual practices is non-probative and irrelevant.

[30] Dr. Pinder testified that when a patient arrived for their appointment, the receptionist would greet the patient. For a new patient such as Ms. Dickson, the receptionist would ask the patient to fill out a Confidential Patient Personal Record form, which contains a list of symptoms that the patient would check-off, and the Informed Consent Form.

[31] The Informed Consent Form that Dr. Pinder used was the one that the CCPA recommended. It contained the following passage that relates to the kind of therapy Ms. Dickson received:

Doctors of chiropractic, medical doctors and physiotherapists who use manual therapy techniques such as spinal adjustments are required to advise patients that there are or may be some risks associated with such treatment. In particular you should note:

...

- b) There have been reported cases of injury to a vertebral artery following cervical spinal adjustments. Vertebral artery injuries have been known to cause stroke, sometimes with serious neurological impairment, and may on rare occasion result in serious injury. The possibility of such injuries resulting from cervical adjustment is extremely remote;

[32] Once the patient completes the forms, the receptionist would place the forms into a folder, escort the patient to the examination room and place the folder in a tray on the door of the examination room. If signed, the receptionist would place the Informed Consent Form at the back of the file.

[33] Dr. Pinder did not allow his staff to respond to any questions concerning the Informed Consent Form, as “that was not their job.” If the patient had any questions, the receptionist would instruct the patient not to sign the Informed Consent Form, and would place the Informed Consent Form on the top of the file, to draw Dr. Pinder’s attention to the unsigned Informed Consent Form. Ms. Mohr confirmed that this was Dr. Pinder’s office procedure. Before he entered the examination room, Dr. Pinder would review the forms to get a sense of the patient’s problem and their symptoms. Dr. Pinder would see new patients for no fewer than 30 minutes.

[34] Dr. Pinder did not usually provide patients with the option of alternative therapies to resolve their neck pain and headaches, other than SMT. He would determine, on a case-by-case basis, whether to discuss alternative therapies with the patient during the case history phase. In the case of neck pain, the alternative therapies might include mobilization, massage therapy, trigger point therapy or physiotherapy.

[35] Following his physical examination of the patient, Dr. Pinder would explain the treatment he proposed and the risks involved in the treatment. He knew that it was his duty to inform that patient of all risks, no matter how slight. He testified that he “always” discussed risks with the patient. Because he usually proposed SMT as a treatment, he would advise the patient of the risk of herniated disc, rib fracture (if the treatment was in the upper thoracic area) and stroke. If the patient was comfortable with the Informed Consent Form, Dr. Pinder would simply ask whether they had any questions. He would explain the proposed procedure and then ask if the patient would like to proceed with the treatment.

[36] Dr. Pinder did not recall whether Ms. Dickson asked him any other questions about the Informed Consent Form. However, he did recall an exchange that related to the risk that SMT could cause a stroke. In 2002, he felt the chances of a patient suffering a stroke as a result of SMT was between one in one million and one in two million. He would have advised Ms. Dickson of these odds, but he did not recall giving her any other advice concerning the Informed Consent Form. That said, Dr. Pinder specifically recalled Ms. Dickson’s reaction to his advice on her odds of suffering a stroke as a result of SMT. He said:

[S]he was quite flippant about it and I went on to explain that, yes, it could happen to her, that stuff does happen and sometimes it's not always a lottery, (Transcript of Proceedings, vol. 5 (24 November 2009) at 0087, ll. 21-25).

[37] Dr. Pinder also recalled Ms. Dickson mentioning that she and her husband had discussed chiropractic treatment and she just wanted her neck fixed.

[38] In Dr. Pinder's opinion, his standard practice and what he recalled of his consultation with Ms. Dickson met the standard of a normal, prudent chiropractor when he informed a patient of SMT, its possible risks, complications, and alternative treatments.

[39] This Court finds that Dr. Pinder discussed with Ms. Dickson only some of the risks and benefits of SMT, and did not address non-chiropractic alternatives.

[40] Did Ms. Dickson become aware of the risk of a stroke from SMT as a result of her reading the Informed Consent Form or during her discussions with Dr. Pinder? During her cross-examination, Ms. Dickson seemed to contradict herself concerning her reading comprehension. She testified during the trial that before her stroke, she had difficulty understanding things like letters from her lawyers. During her examination for discovery, however, she testified that before her stroke she did not find these letters difficult to understand, although she had to read them over.

[41] Ms. Dickson could not recall whether she read the Informed Consent Form and testified that even had she read it, she would not have understood it, as it had "many long words and when these words start being put into sentences," she would "get confused." She also testified that since her stroke her reading ability had deteriorated.

[42] Whether Ms. Dickson had a reasonable level of reading comprehension, which this Court finds she had, does not fully answer the question whether she *understood* the content of the Informed Consent Form. Dr. Pinder testified that his writing "informed consent" on Ms. Dickson's chart indicated that he had discussed with Ms. Dickson her chance of suffering a stroke from SMT. We do not know to what extent he discussed this topic with her. Although the Informed Consent Form referred to the risk of stroke, Dr. Pinder testified that he did not explain strokes to Ms. Dickson, other than to provide her with the statistical probability of her suffering one. Nor did he explain the consequences of a stroke or that SMT could dissect her vertebral artery. He did not "test" her understanding of the Informed Consent Form.

[43] Therefore, this Court concludes that Ms. Dickson had read and was informed by Dr. Pinder that "a stroke" may occur as a consequence of the proposed SMT therapy. However, it also finds that Ms. Dickson did not understand the meaning of that term, though she no doubt contextually realized that a stroke must have some kind of negative outcome or result. This Court further concludes that she did not understand that a stroke was a very serious result, and her flippant response to Dr. Pinder's analysis is evidence of that point. It would be very unusual

for a person to dismiss casually an extremely negative result, without further investigation of that result, including the details of that result and other contributory risk factors.

B. expert testimony on chiropractic informed consent practices

[44] The purpose of the expert testimony is to assist the court. Experts should be independent and not advocates for one side or the other, *McCann v. Hyndman*, 2004 ABCA 191, 354 A.R. 35 at para. 8; *Wallace v. Zradicka*, 2006 BCSC 1166, 59 B.C.L.R. (4th) 330 at para. 66.

[45] The experts in this case provided this Court with differing views on many of the issues that this Court intends to discuss. In *Challand v. Bell* (1959), 18 D.L.R. (2d) 150 at 155 (Alta. S.C.), the court said:

Where the experts disagree but some of them support the treatment given, then surely the treatment given by the general practitioner should not be criticized, and one must always keep in mind the importance of viewing the treatment and seeing matters through the eyes of the attending physician.

[46] Although one could see this statement as the “tie goes to the medical practitioner,” this Court chooses not to take that approach. Rather, this Court sees its analysis of the expert evidence as one more tool in its toolbox when it examines the issue it is facing “through the eyes” of Dr. Pinder. The tie goes to Dr. Pinder only if Ms. Dickson has not proven all elements of her case on a balance of probabilities. With respect, the cases that imply the “tie goes to the medical practitioner” approach have taken this holistic analysis, see *e.g. Clare v. Ostolosky* (2001), 300 A.R. 341 (Alta. Q.B.) at paras. 34 and 78; *O’Grady v. Stokes*, 2005 ABQB 247, 375 A.R. 109 at para. 104; *Rogers v. Grypma*, 2001 ABQB 958, 304 A.R. 201 at para. 261.

[47] For this Court to admit expert evidence, it must be satisfied that the expert witness possesses special knowledge and experience that goes beyond that of the trier of fact. It is immaterial how the witness acquired the special knowledge or skill, whether from study or instruction, practical experience or observation, or both.

[48] What are the limits to which the court may use an expert’s testimony? *Anderson v. Chasney and Sisters of St. Joseph*, 1949 CarswellMan 39 at para. 43, [1949] 4 D.L.R. 71 at 86 (cited to CarswellMan) aff’d [1950] 4 D.L.R. 223 (S.C.C.) said:

The experts remain witnesses to give their expert opinions in assistance of the jury or the Court to determine whether there was negligence or not. The opinions of the experts are not conclusive. But when an operation itself is a complicated and critical one, and acquaintance with anatomy, physiology or other subjects of expert medical knowledge, skill and experience are essential, jury or Court may not be justified in disregarding such opinions and reaching conclusions based on views contrary to those of the experts.

If the expert's medical knowledge is not necessary or essential for the court to reach a conclusion, the court may treat the expert's evidence as it would any other evidence, and accord it the appropriate weight, *Schanzl v. Singh* (1987), 56 Alta. L.R. (2d) 303, 8 A.C.W.S. (3d) 138 at para. 34 (Q.B.). Deficiencies in the expertise go to weight, not admissibility. The same is true for bias, *1159465 Alberta Ltd. v. Adwood Manufacturing Ltd.*, 2010 ABQB 133 at paras. 2.1-2.32.

[49] In the end, it is not the experts but this Court that decides the various issues before it. Otherwise, the experts would be deciding this case and not this Court. This is impermissible, *Rogers* at para. 257.

[50] In this case, the experts' divergent opinions are not decisive, though they are helpful. That is not to say that these experts' opinions were irrelevant. On many crucial points they agreed. They agreed that strokes were a known, though rare, consequence of chiropractic adjustment of neck vertebrae. They agreed that Ms. Dickson could have received other alternative treatments, chiropractic and non-chiropractic. There are, however, points where the experts' opinions diverge and this Court will address those specifically in the context in which they appear.

[51] Each party presented one expert witness to assist this Court in determining whether Dr. Pinder met the standard of care imposed on him when he obtained Ms. Dickson's consent to the SMT. Both experts provided this Court with reports pursuant to *Rule 218.1* of the *Alberta Rules of Court*, Alta. Reg. 390/68 [the "Rules" or individually, a "Rule"].

[52] Dr. Carstensen is a chiropractor, who has practised as such off and on since he graduated from chiropractic school in 1996. Following his graduation, he practised in St. John's, Newfoundland. He attended medical school from 2004 to 2008 and received his doctor of medicine degree in 2008. While attending medical school, he practised chiropractic only during the first year of his medical studies, as his medical studies occupied too much of his time thereafter to allow him to practise chiropractic. This Court qualified him to give an expert opinion concerning the standard of care expected of a chiropractor in 2002. Dr. Carstensen provided his *Rule 218.1(1)* report dated July 22, 2009 ("Carstensen's Report").

[53] Despite the reference to the risk of stroke in the Informed Consent Form, Carstensen's Report at para. 19, stated that Dr. Pinder did not meet "the standard of care and disclosure expected of a reasonable and prudent chiropractor in Canada in 2002." In particular, Carstensen's Report at para. 20 states [emphasis added]:

A chiropractor has an obligation to ensure that each patient is aware of the material risks associated with any proposed treatment. The obligation to ensure that patients give their consent to treatment involves more than simply providing a standardized form to sign. Obtaining proper consent involves the disclosure of the possible risks and expected benefits associated with the proposed treatment, a discussion of alternative treatment options and the consequences of pursuing no

treatment at all. This can only be accomplished after a diagnosis has been reached (following a clinically [sic.] history, physical examination and any necessary testing). Further, the chiropractor must take reasonable steps to ensure that the patient fully understands the risks, benefits and alternatives to the proposed treatment. My opinion on this matter is informed by my chiropractic education, and my professional experience.

[54] Furthermore, the chiropractor will not meet their standard of care simply by inquiring whether the patient has any questions about the informed consent form, especially if one is dealing with an unsophisticated patient, Carstensen's Report at para. 21. Dr. Carstensen testified that different patients have different levels of sophistication and understanding. Thus, he was of the opinion that it is important that the chiropractor "tailor the consent process to the individual patient."

[55] Carstensen's Report at para. 22 goes further and states that Ms. Dickson's "flippant" attitude concerning her chances of suffering a stroke should have alerted Dr. Pinder that she did not understand this risk. Dr. Carstensen testified that the risk of stroke is "very rare." However, in Dr. Carstensen's opinion, Dr. Pinder should have refused to treat Ms. Dickson until he was convinced that "she understood and accepted the rare but potentially devastating risk associated with the proposed treatment." Dr. Carstensen testified that Dr. Pinder should have explained the nature of the types of strokes and the consequences that could flow from a stroke.

[56] Carstensen's Report at para. 23 states that Dr. Pinder should have explained to Ms. Dickson that "her symptoms were likely to resolve without any treatment, if her past history was any indication." Dr. Carstensen further testified that Dr. Pinder should have informed Ms. Dickson of reasonable treatment alternatives, such as activator treatment, mobilization, stretching, physiotherapy, medication, as prescribed by a physician, or doing nothing.

[57] As for the process of the medical practitioner obtaining a signed informed consent form, Dr. Carstensen opined that any such document should be signed *after* the medical practitioner obtains a patient's history, conducts a clinical examination, makes a diagnosis, and recommends a treatment. In this respect, he opined that he did not feel that Dr. Pinder completed the informed consent process. During cross-examination, Dr. Carstensen acknowledged that he did not know exactly what Dr. Pinder discussed with Ms. Dickson when Dr. Pinder noted on his chart "informed consent." As well, Dr. Carstensen acknowledged that Dr. Pinder appeared to have undertaken a reasonable clinical history and examination.

[58] This Court qualified Dr. Donald Henderson as an expert in chiropractic care, including the standard of care required of chiropractors practising in Alberta in 2002. Dr. Henderson provided a *Rule* 218.1(1) report dated January 14, 2008 ("Henderson's First Report") and a further report on August 24, 2009 ("Henderson's Second Report").

[59] Dr. Henderson is a chiropractor who has practised in Toronto, Ontario since 1975. He has published articles in peer-reviewed journals and was the co-editor of Donald Henderson,

David Chapman-Smith, Silvano Mior & Howard Vernon, eds., *Clinical Guidelines for Chiropractic Practice in Canada* (1994) 38 J. Can. Chiropractic Ass'n. (Supp.), which is also known as the "*Glenerin Guidelines*."

[60] The *Glenerin Guidelines* at 3 says [emphasis added]:

As a matter of ethics and law there is an obligation, prior to examination and treatment, to disclose any material risk to the patient in order to obtain a valid informed consent. This legal duty has been established by case law and, in some provinces, by legislation.

[61] Among other things, Henderson's First Report concluded that, "Dr. Pinder took an informed consent that was consistent with the chiropractic profession's recommendations in 2002 ..."

[62] Henderson's Second Report specifically addressed matters that arose out of Carstensen's Report. Henderson's Second Report commented that Dr. Pinder used a standard consent form that the CCPA recommended at the time, even though the "Alberta College and Association Standards of Practice in 2002 did not specify any required form or describe, in any manner, the doctrine of informed consent (until June 1, 2004)." Henderson's Second Report also noted that Ms. Dickson was implicitly aware of the need to sign informed consent forms because of her numerous prior medical treatments and surgery.

[63] Henderson's Second Report also stated, "that Dr. Pinder made [Ms. Dickson] aware of his clinical diagnosis and the risks associated with chiropractic treatment, ensured that her consent was obtained and provided an opportunity for discussion after disclosing any associated risk." This confirms the conclusions set forth in Henderson's First Report.

[64] Dr. Henderson testified that it was appropriate for the chiropractor to have the patient sign the informed consent form while in the waiting room. This would give the patient an opportunity to read the form and not to sign the form if they did not understand it. Dr. Henderson opined that this was the idea behind the words "prior to" in the *Glenerin Guidelines*. Dr. Henderson then testified that if the patient signed the informed consent form, the chiropractor need not discuss the form again until the chiropractor completed the patient's case history and clinical examination to determine the patient's problem. This is not so different from what Dr. Carstensen testified, although Dr. Henderson and Dr. Carstensen differed in their views as to when the patient should sign the informed consent form. It is important to note that both experts concluded that a form alone would not "inform" a patient. The chiropractor must consult directly with the patient.

[65] Dr. Carstensen and Dr. Henderson differed in their opinions concerning the discussion of alternative treatments. Dr. Carstensen felt that the chiropractor had to discuss these with the patient. Dr. Henderson, on the other hand, testified that the chiropractor needed to discuss alternative treatments only if the patient showed apprehension concerning the proposed

treatment. In his view, the chiropractor need not actively pursue alternative treatments. Dr. Henderson also stated that any alternative treatments a chiropractor recommends must be effective and appropriate for the patient and the patient's problem. Furthermore, Dr. Henderson did not feel that chiropractors needed to discuss alternative treatments as a part of the chiropractor's standard of care in 2002.

[66] Dr. Henderson felt that by providing the patient an opportunity to raise the issue of alternatives treatments, this was in keeping with a patient-centred approach. During cross-examination, however, he agreed that this approach was not realistic or practical for all patients. The medical practitioner must play some role in this exchange.

A ... You provide [the patient] with the informed consent. You give them the risks versus the benefits of the treatment that you're about to provide in the future, assuming.

It's at that point that you engage in a conversation, because it's a two-way street. If that patient in my mind brings up but what else can I do or if the chiropractor feels that it's important that the alternative therapies be discussed, then I think that can happen.

...

Q How is the Doctor to have any discussion or more importantly, how is the patient to have any knowledge of what available and alternative treatments are out there without that discussion coming or information coming from the chiropractor? Do you understand the difficulty I'm having with this?

A Yes

Q Isn't that fair?

A I think that's fair.

Dr. Henderson confirmed that this is particularly true when a chiropractor is faced with a new patient.

iii. informed consent - legal principles

[67] In Canada, a patient has a right to know the nature of any proposed medical therapy, its risks and benefits, and what alternatives may exist. The Supreme Court of Canada refused to accept the "traditional" approach to medical care, in which doctors made all decisions concerning patient care. Instead, it emphasized a new "patient-centred" approach that "emphasizes the patient's right to know and ensures that the patients will have the benefit of a high standard of disclosure," *Arndt v. Smith*, 1997 CarswellBC 1260, [1997] 2 S.C.R. 539 at

para. 15 (cited to CarswellBC). This principle was forcefully described in *Fleming v. Reid* (1991), 4 O.R. (3d) 74 at 85, 82 D.L.R. (4th) 298 (C.A.), where the court said:

The right to determine what shall, or shall not, be done with one's own body, and to be free from non-consensual medical treatment, is a right deeply rooted in our common law. This right underlies the doctrine of informed consent. ... The fact that serious risks or consequences may result from a refusal of medical treatment does not vitiate the right of medical self-determination. ... It is the patient, not the doctor, who ultimately must decide if treatment — any treatment — is to be administered.

Any patient who does not receive sufficient information cannot meaningfully consent to medical treatment. See also *Ciarlariello v. Schacter*, 1993 CarswellOnt 803, [1993] 2 S.C.R. 119 at para. 41.

[68] In Canada, a medical practitioner must inform a patient about certain key facts:

1. the medical practitioner's diagnosis of the patient's condition;
2. the prognosis of that condition with and without medical treatment;
3. the nature of the proposed medical treatment;
4. the risks associated with the proposed medical treatment; and
5. the alternatives to the proposed medical treatment, and the advantages and risks of those alternatives.

In this case, the parties and their experts focused on the last two factors.

A. *risks that may result from treatment*

[69] In *Challand* at 153, the court, quoting from the case of *Roe v. Minister of Health*, [1954] 2 Q.B. 66 at 80 (C.A.) said, "In medical cases the fact that something has gone wrong is very often not in itself any evidence of negligence. In surgical operations there are inevitably risks." Even though medical procedures involve inevitable risks, the medical practitioner must still undertake a risk analysis; what are the risks that the patient faces when that patient agrees to undergo the treatment the medical practitioner recommends? Which are the inevitable risks and which are not?

[70] The principle that the Supreme Court of Canada outlined in *Hopp* addressed a patient who was facing surgery. That principle, however, established the foundation on which the Canadian notion of informed consent is based. The court said at para. 34 [emphasis added]:

... [I]n obtaining the consent of a patient for the performance upon him of a surgical operation, a surgeon generally should answer any specific questions posed by the patient as to the risks involved and should, without being questioned, disclose to him the nature of the proposed operation, its gravity, any material risks and any special or unusual risks attendant upon the performance of the operation. However, having said that, it should be added that the scope of the duty of disclosure and whether or not it has been breached are matters which must be decided in relation to the circumstances of each particular case.

[71] Since *Hopp*, courts across Canada have built on this foundation and have expanded or clarified the various aspects of it. The Supreme Court of Canada fine-tuned this principle in *Reibl v. Hughes*, [1980] 2 S.C.R. 880, 114 D.L.R. (3d) 1. In *Videto v. Kennedy*, 1981 CarswellOnt 580, 33 O.R. (2d) 497 at paras. 12-19 (C.A.), the Ontario Court of Appeal commented on the principles identified in *Reibl* in a manner relevant to the present matter:

1. The question of whether a risk is material and whether there has been a breach of the duty of disclosure are not to be determined solely by the professional standards of the medical profession at the time. The professional standards are a factor to be considered.
2. The duty of disclosure also embraces what the surgeon knows or should know that the patient deems relevant to the patient's decision whether or not to undergo the operation. If the patient asks specific questions about the operation, then the patient is entitled to be given reasonable answers to such questions. In addition to expert medical evidence, other evidence, including evidence from the patient or from members of the patient's family is to be considered. In [*Reibl* at para. 16] Laskin C.J.C. stated:

The patient may have expressed certain concerns to the doctor and the latter is obliged to meet them in a reasonable way. What the doctor knows or should know that the particular patient deems relevant to a decision whether to undergo prescribed treatment goes equally to his duty of disclosure as do the material risks recognized as a matter of required medical knowledge.
3. A risk which is a mere possibility ordinarily does not have to be disclosed, but if its occurrence may result in serious consequences, such as paralysis or even death, then it should be treated as a material risk and should be disclosed.
4. The patient is entitled to be given an explanation as to the nature of the operation and its gravity.

5. Subject to the above requirements, the dangers inherent in any operation such as the dangers of the anaesthetic, or the risks of infection, do not have to be disclosed.
6. The scope of the duty of disclosure and whether it has been breached must be decided in relation to the circumstances of each case.
7. The emotional condition of the patient and the patient's apprehension and reluctance to undergo the operation may in certain cases justify the surgeon in withholding or generalizing information as to which he would otherwise be required to be more specific.
8. The question of whether a particular risk is a material risk is a matter for the trier of fact. It is also for the trier of fact to determine whether there has been a breach of the duty of disclosure.

[72] The court in *White v. Turner*, 1981 CarswellOnt 569, (1981), 120 D.L.R. (3d) 269 at paras. 52-54 (S.C.) (cited to Carswell), aff'd 47 O.R. (2d) 764, 12 D.L.R. (4th) 319 (C.A.) explained material, special or unusual risks as follows:

The meaning of "material risks" and "unusual or special risks" should now be considered. In my view, material risks are significant risks that pose a real threat to the patients' life, health or comfort. In considering whether a risk is material or immaterial, one must balance the severity of the potential result and the likelihood of its occurring. Even if there is only a small chance of serious injury or death, the risk may be considered material. On the other hand, if there is a significant chance of slight injury this too may be held to be material. As always in negligence law, what is a material risk will have to depend on the specific facts of each case.

As for "unusual or special risks", these are those that are not ordinary, common, everyday matters. These are risks that are somewhat extraordinary, uncommon and not encountered every day, but they are known to occur occasionally. Though rare occurrences, because of their unusual or special character, the Supreme Court has declared that they should be described to a reasonable patient, even though they may not be "material". There may, of course, be an overlap between "material risks" and "unusual or special risks". If a special or unusual risk is quite dangerous and fairly frequently encountered, it could be classified as a material risk. But even if it is not very dangerous or common, an unusual or special risk must be disclosed. As was explained by Laskin C.J.C. [in *Reibl* at para. 4], even if a certain risk is a "mere possibility which ordinarily need not be disclosed, yet if its occurrence carries serious consequences, as for example, paralysis or even death, it should be regarded as a material risk requiring disclosure".

It should also be mentioned that there are some common, everyday risks that exist in all surgery, which everyone is expected to know about. Doctors need not warn about them, since they are obvious to everyone.

[73] In *McArdle Estate* at para. 27, the Alberta Court of Appeal said [citations omitted]:

The degree of foreseeable risk involved in a procedure or treatment is not only an appropriate, but indeed an essential determinant of the appropriate standard of care. The standard of care is influenced by the foreseeable risk. As the degree of risk increases, so does the standard of care of the doctor.

[74] In summary, a medical practitioner must disclose a risk, where the patient would not know of the risk and either:

- (a) the risk is a likely consequence, and the injury that would result is at least a slight injury, or
- (b) the risk has a serious consequence, such as paralysis or death, even where that risk is uncommon but not unknown.

In other words, the medical practitioner must undertake a “risk assessment” and determine the risks a patient wants and needs to know to decide on their choice of therapy.

B. alternative treatments to the proposed therapy

[75] The parties spent a great deal of time arguing whether, as part of the informed consent process, a medical practitioner must canvas alternative treatments with the patient. Canadian jurisprudence has established that there is no question on that point. A patient cannot meaningfully choose a therapy unless the medical practitioner places that therapy in context, with alternatives and the consequence of inaction. In *Zimmer v. Ringrose*, 1981 CarswellAlta 251, 124 D.L.R. (3d) 215 at para. 16 (C.A.) (cited to Carswell) the Alberta Court of Appeal said:

With a view to revealing any probable or special risks involved, the physician or surgeon should also discuss the benefits to be gained from the recommended treatment or operation, the advantages and disadvantages associated with alternative procedures and the consequences of foregoing treatment. Such a discussion is essential since a patient cannot measure risks in the abstract. To discharge his duty of care, the doctor must give the patient some yardstick against which he can assess the options available to him.

[76] The Saskatchewan Court of Appeal agreed with this approach in *Haughian v. Paine*, [1987] S.J. No. 240, 37 D.L.R. (4th) 624 (C.A.), when it said at para. 43:

... to enable a patient to give informed consent, a surgeon must also, where the circumstances require it, explain to the patient the consequences of leaving the ailment untreated, and alternative means of treatment and their risks.

[77] The *Haughian* court at para. 38, found that the medical practitioner failed to comply with his duty of disclosure when he failed:

... to advise adequately, or at all, of the available options of no treatment, or conservative management. While it may have been open to the respondent not to recommend these options by way of treatment, the patient was entitled to be advised that these alternatives were open to him.

See also *Zaiffdeen v. Chua*, 2005 ABCA 290, 380 A.R. 200; *Sicard* at para. 111; *Gallant v. Patten*, 2010 NLTD 1, 292 Nfld. & P.E.I.R. 279 at paras. 55-58.

[78] The fact that medical practitioners have been using a particular procedure or treatment “since time immemorial” is no answer to the question whether the medical practitioner should present to the patient alternative treatments or procedures. In *Semeniuk v. Cox*, 2000 ABQB 18, 258 A.R. 73 at para. 36, the court said, quoting *Sisters of St. Joseph*, at para. 63:

Ordinary common sense dictates that if simple methods to avoid danger had been devised, are known, and are available, non-user, with fatal results, cannot be justified by saying that others have also been following the same old, less-careful practice; and that when such methods are readily comprehensible by the ordinary person, by whom, also, the need to use them or not is easily apprehended, it is quite within the competence of court or jury, quite as much as of experts to deal with the issues; and to that the existence of a practice which neglects them, even if the practice were general, cannot protect the defendant surgeon.

[79] How far must a medical practitioner go to satisfy this obligation? The Alberta Court of Appeal recognized this concern in *Seney v. Crooks*, 1998 ABCA 316, 223 A.R. 145 at paras. 57-58 and said that the “scope of the duty to inform must be approached carefully” and might not include a “fringe alternative” or “alternative medicine practices.” As well, the medical practitioner’s obligation might not apply where the medical practitioner believes that the alternative means of treatment are not reasonable options, *Seney* at para. 69, see also *Bucknam v. Kostuik* (1983), 44 O.R. (2d) 102, 3 D.L.R. (4th) 99 at para. 21 (H.C.J.) aff’d on other grounds (1986), 55 O.R. (2d) 187, 38 A.C.W.S. (2d) 158 (C.A.).

[80] Must the medical practitioner present the option of conservative or no treatment as a reasonable alternative? The *Haughian* court at para. 38 and the *Sicard* court at para. 111 felt it did. Of course, whether these are reasonable alternatives will depend on the facts and the patient’s circumstances. In *Guay v. Wong*, 2008 ABQB 638, 463 A.R. 289 at para. 114 the court said:

The option of no treatment for pain is not, strictly speaking, an alternative treatment, and is, in any event, an option that Mrs. Guay, or any reasonable person, would have been aware of. As to non-pharmaceutical methods such as heat packs or changes in position, these had already been attempted. As they had not succeeded in relieving Mrs. Guay's pain, it is arguable whether they remained reasonable alternative treatments. Further, Mrs. Guay, and any reasonable person in her circumstances of having already attempted these methods, would have been well aware of these alternatives. I am not satisfied that disclosure of no treatment or non-pharmaceutical methods was required. Alternatively, I am not satisfied that disclosure of these alternatives would have made a difference to the treatment decision of Mrs. Guay or a reasonable person in her position.

[81] In short, the case law is clear that a medical professional disclose reasonable alternatives to any therapy they propose. This is a fact-dependent threat assessment process. A patient cannot make a meaningful and informed choice to consent to a therapy unless that patient knows the consequences of other reasonable alternatives or inaction, and can balance the risks and benefits of the proposed therapy against those alternatives.

iv. informed consent - analysis

A. *failure to identify and characterize the risk of a stroke being caused by SMT*

I. relevance of the Informed Consent Form

[82] Dr. Carstensen's opinion that the chiropractor must obtain the patient's consent after examination and diagnosis is contrary to the *Glenerin Guidelines*. The court in *Olsen* disagreed with Dr. Carstensen's interpretation of how a chiropractor should approach the informed consent process and agreed with the *Glenerin Guidelines* approach. With respect, the whole issue of informed consent is a process, not a form. To a certain extent, both the *Glenerin Guidelines* and Dr. Carstensen are correct in their respective approaches; as well, they are both wrong.

[83] The Informed Consent Form is useful as a starting point, as it informs the patient of certain risks inherent in chiropractic treatment. A patient must understand those risks before the chiropractor even starts any type of physical examination, as there are risks inherent in the physical examination itself, which may be significant or material. After a chiropractor arrives at a diagnosis and proposed treatment plan, the chiropractor must then inform the patient of the risks flowing from the proposed treatment. For example, if the chiropractor suggests soft-tissue massage to deal with carpal tunnel syndrome, why inform the patient of the risk of stroke? Relevant risks arise from the factual context of the particular patient and their malady.

[84] If the words "prior to" in the *Glenerin Guidelines* modify the word "examination" and the word "treatment," then that is the correct approach. If they modify the words "examination and treatment" and the chiropractor obtains a signature on a form while the patient is in the

waiting room, with no other discussion, then that is an incorrect approach and the chiropractor by so doing has not fulfilled their duty. That approach makes a mockery of the jurisprudence flowing from the doctrine of informed consent since *Hopp*.

[85] In *Archibald v. Kuntz*, [1994] B.C.J. No. 199 (QL) (S.C.) the court at para. 20, agreed with the *Coughlin v. Kuntz* (1989), 17 B.C.L.R. (2d) 365, 42 C.C.L.T. 142 (S.C.) at 393, aff'd (1989) 42 B.C.L.R. (2d) 108, 2 C.C.L.T. (2d) 42 (C.A.) court when it said [emphasis added]:

... [T]he consent forms signed by the plaintiff cannot in any way protect the defendant as I find the defendant failed in his duty to explain and fully disclose all relevant information to the plaintiff relating to his proposed neck surgery. ... The signing of the consent forms by the plaintiff in the hospital on the eve of surgery was a mere formality incapable of satisfying the defendant's duty of disclosure. For consent forms to have any legal effect there must be an adequate knowledge base on the part of the patient before the exempting language of the form will provide its intended protection for the surgeon or the hospital from adverse effects of the operation. As stated in cross-examination by the nurse who presented the forms to the plaintiff in the hospital and witnessed his signature, it is the responsibility of the surgeon to obtain the informed consent of a patient to surgery and it is her responsibility simply to get the form signed before the patient undergoes his operation.

[86] When a medical practitioner requires a patient to review and sign an informed consent form before the medical practitioner undertakes any diagnosis and treatment of the patient, a court will consider that factor when it attempts to determine whether the medical practitioner has complied with their duty of disclosure, see *e.g. Olsen* at para. 128. Medical practitioners must be cautious when they only rely on a signed informed consent form. The medical practitioner must take reasonable steps to ensure that the patient understands and appreciates the nature of the procedure to which the patient is consenting and the form that the patient has signed. Otherwise, the court could find that the consent was one that was not informed, see *e.g. Coughlin; Archibald; Byciuk v. Hollingsworth*, 2004 ABQB 370, 358 A.R. 312 at para. 33, *Martin v. Findlay*, 2008 ABCA 161, 432 A.R. 165 at para. 38. Dr. Henderson agreed with this. He confirmed that a signed form itself is not sufficient for the chiropractor to meet their standard of care in this regard. The chiropractor needed to have a discussion with the patient after they obtained a history, conducted a physical examination and reached a diagnosis.

[87] In summary, the Informed Consent Form is only useful and relevant in this case if Ms. Dickson knew the meaning and implications of the statements contained in that form. If Ms. Dickson did not know anything about a stroke and its potential consequences, then her signature on the Informed Consent Form in relation to stroke is meaningless and her consent is not informed.

II. Dr. Pinder's direct consultation with Ms. Dickson

[88] This Court found that Dr. Pinder mentioned the risk of stroke to Ms. Dickson during his pre-treatment interview with her. Dr. Pinder was certain of his recollection concerning the discussion he had with Ms. Dickson following her comment that a stroke would not happen to her and this Court finds that he had that discussion with Ms. Dickson. The fact that Dr. Pinder specifically wrote “informed consent” in his chart indicated to Dr. Henderson that Dr. Pinder discussed this with Ms. Dickson. This Court agrees.

[89] The next question is whether it was necessary for Ms. Dickson to have an understanding that the risk of stroke was a “material risk” or “unusual or special risk,” the kind of risk that a patient needs to know to make an informed decision as to whether to consent to SMT. There is no question that Dr. Pinder had to disclose and explain the stroke risk to Ms. Dickson. In *Mason v. Forgie*, 1986 CarswellNB 72, 38 C.C.L.T. 171 at para. 6 (C.A.), leave denied [1987] S.C.C.A. No. 11, the court held that even though the risk of stroke arising from SMT is rare, this risk is a material risk that required the chiropractor to disclose the risk, “particularly bearing in mind the seriousness of the possible consequences.”

[90] In *Leung v. Campbell*, [1995] O.J. No. 10 (QL), 24 C.C.L.T. (2d) 63 (Ct. J. (Gen. Div.)) at para. 32, the court said that:

One is not to determine whether a risk is to be disclosed or not solely on the basis of its “arising in a very low percentage of cases.” One must balance “the severity of the potential result and the likelihood of its occurring”.

Accordingly, it found at para. 47, that the risk of stroke following SMT is “unusual or special in that it was not ordinary, common nor encountered every day but rather was extraordinary and known to occur occasionally.” This Court agrees. As stated by the Supreme Court of Canada in *Mustapha v. Culligan of Canada Ltd.*, 2008 SCC 27, [2008] 2 S.C.R. 114 at para. 13:

Any harm which has actually occurred is “possible;” it is therefore clear that possibility alone does not provide a meaningful standard for the application of reasonable foreseeability. The degree of probability that would satisfy the reasonable foreseeability requirement was described in *The Wagon Mound (No. 2)* as a “real risk” ...

[91] The parties argued that Dr. Pinder was not fully aware of the statistics of a patient suffering a stroke as a result of SMT. The parties presented varying statistics concerning the risk of stroke from SMT. Suffice it to say that SMT presented a risk of stroke, however remote or rare, and the *Reibl* court at para. 17 said, in any event, “the failure to mention statistics should not affect the duty to inform nor be a factor in deciding whether the duty has been breached.”

[92] In any case, Dr. Pinder cannot say that he was unaware of the risk of stroke in this situation, or thought it inconsequential. The Informed Consent Form that his office used expressly indicates this risk.

[93] This Court finds that since Ms. Dickson did not understand the full implications of a stroke, she could not have consented to treatment through her signing of the Informed Consent Form.

[94] How is the chiropractor to discharge their duty of disclosure to the patient? Certainly, the chiropractor must provide the patient with reasonable responses to questions that the patient poses. This assumes that the patient poses any such questions. The *Byciuk* court explained why patients might not pose questions, when it said at para 34:

He may be intimidated by or deferential to the physician's superior knowledge. He may not wish to demonstrate his failure to understand. He may have long since forgotten what he intended to ask. If he understood none of the message, he may not know what to ask. See Picard and Robertson *supra* at 139.

A number of problems exist with respect to patients asking questions. Unless secure in their relationship with the doctor, many patients are unlikely to ask questions. Or they may not know enough to enable them to frame specific or even general questions. It is perhaps not surprising that so few of the reported cases indicate that questions are asked by the patient.

[95] If a patient does not ask questions, the chiropractor cannot assume that the patient understands the various risks. The chiropractor must discuss with the patient each material, unusual or special risk, be satisfied that the patient appeared to understand those risks and note that fact on the patient's chart, *Byciuk* at para. 38, *Finch v. Carpenter*, [1993] B.C.J. No. 1918 (QL), 42 A.C.W.S. (3d) 1095 at paras. 20, 22 (S.C.).

[96] By not explaining the characteristics and consequences of a stroke, did Dr. Pinder fail to disclose sufficient information to allow Ms. Dickson to make an informed decision of whether to consent to SMT, *Raymor v. Knickle*, 1991 CarswellPEI 105, 88 Nfld. & P.E.I.R. 214 at para. 58 (P.E.I.C.A.)? In other words, what is the scope of the disclosure that Dr. Pinder should have provided to Ms. Dickson? Should he have confirmed with Ms. Dickson that she understood what he had said?

[97] In *Zimmer* at para. 12, the court said:

Some patients have great confidence in the judgment of their physician and accept his recommendations without question. The last thing they want is a detailed explanation of the possible risks in the proposed procedure. Others wish to become involved in the decision-making process and will seek further information before consenting.

The *Archibald* court at para. 24 said, “A surgeon is not required to discuss the minutiae of what is being done in a discussion with a patient prior to obtaining consent, but at least a fair outline must be given ...”

[98] As well, *Reibl* tells us that this Court must consider Ms. Dickson’s circumstances when it attempts to discern whether Ms. Dickson fully understood the Informed Consent Form and Dr. Pinder’s explanation of it. In *Finch*, the patient signed a form that warned her of potential risks and complications. The court at para. 19, found that the oral surgeon had not satisfied his duty of disclosure because, *inter alia*, the form used “technical language,” which detracted “substantially from its impact on an understandably tense patient.” Does this mean that a medical practitioner has a higher duty of disclosure when they are dealing with overly fearful patients or, for example, when a patient is in considerable pain when faced with a standard form? What about a patient who does not understand what the medical practitioner is saying, because of a language or comprehension barrier? The court in *Adan v. Davis*, 68 O.T.C. 321, 43 C.C.L.T. (2d) 262 at para. 32 (Ct. J. (Gen. Div.)) was dealing with a patient who was corresponding with the physician through an interpreter. It said at para. 41:

... [T]he physician's duty in these circumstances must surely extend beyond a standard recitation of a proposed surgery as if this were a patient who speaks the physician's language ... The physician must ensure that the patient is returning reasonable and responsive replies. If the patient is silent and asks no questions as was the case here, it is the responsibility of the physician to ask appropriate questions through the interpreter so as to be satisfied that the information has been understood.

[99] The language that medical practitioners use is often a different language, even for those patients who speak English. Thus, a medical practitioner could run a serious risk that their patient does not understand their language when the patient’s first language is not English or, if it is English, when the medical practitioner uses medical terminology, Latin or technical terminology.

[100] This principle also applies to documents. The court must also look at the form itself to determine whether it is accurate and whether it provides the patient with enough information. In other words, the court must find whether the form itself “informs” the patient or whether it provides merely an outline on which the medical practitioner must build, see *e.g. Philion v. Smith*, 2008 CarswellOnt 5090, 61 C.C.L.T. (3d) 113 (Sup. Ct. J.).

[101] Did Dr. Pinder go far enough in fulfilling his duty of disclosure? Surely, Dr. Pinder need not be required to “test” Ms. Dickson as to her understanding of the Informed Consent Form. Furthermore, Dr. Pinder need not explain the intricacies of vertebral artery dissection or stroke and its consequences. However, for a consent to be informed, Dr. Pinder should have explained to Ms. Dickson the concept of stroke and the serious consequences that could flow from her suffering a stroke. He should have been comfortable that Ms. Dickson understood his explanation. This is the kind of serious injury about which any person would want to know, even

if the risk is low. Ms. Dickson testified that she did not understand the risk, and her flippant response reported by Dr. Pinder is strong evidence of that misunderstanding.

[102] *Martin v. Findlay* at paras. 33-34, said that although the medical practitioner need not use the word “stroke,” a patient must understand the *consequences* of that injury. Otherwise, a patient does not know to what they are consenting. Dr. Pinder failed in this regard and, as a result, he failed in his duty of disclosure. Ms. Dickson should have been made aware, at a minimum, that the treatment Dr. Pinder proposed brought with it the risk of stroke and its consequences.

B. alternative remedies

[103] Dr. Pinder considered SMT as the only appropriate therapy because he did not indicate any other reasonable alternatives. Was this a breach of his duty of disclosure?

[104] Both experts recognized that the chiropractor must present the patient with alternatives to the proposed treatment. Dr. Carstensen testified that the chiropractor must inform the patient of reasonable treatment alternatives. Dr. Henderson was less definitive when he said that the chiropractor needs to discuss alternative treatments only if the patient showed apprehension concerning the proposed treatment and the chiropractor need not actively pursue alternative treatments.

[105] With respect, neither expert seemed to have thought through the *purpose* for which chiropractors obtain informed consents, in this respect. Dr. Carstensen during cross-examination, did not accept that the chiropractor must analyze the patient’s clinical and non-clinical needs and concerns before recommending alternative treatments. For example, why suggest no treatment when no treatment has not worked for the patient to that point? That is why the patient is in the chiropractor’s office in the first place. During his direct examination and cross-examination, Dr. Henderson used the term “patient-centred” several times, but his testimony did not bear out a patient-centred approach. How can a patient pose questions or appear apprehensive when the patient has no idea what alternatives are available to the patient? A patient-centred approach requires the chiropractor obtain a patient history, conduct a clinical examination, and diagnose the patient’s problem. The chiropractor must then discuss *reasonable treatment alternatives* with the patient. The Alberta Court of Appeal has required medical practitioners to comply with this requirement since 1981, see *e.g. Zimmer*.

[106] There is no question on the appropriate legal rule; alternative therapies *must* be disclosed: *Zimmer* at para. 16; *Haughian* at paras. 38, 43. The *Zimmer* court at para. 16 said, “[t]o discharge his duty of care, the doctor must give the patient some yardstick against which he can assess the options available to him.” The experts agreed that SMT was not the only possible treatment for Ms. Dickson’s condition, and this Court agrees with Dr. Carstensen that her history indicated that the pain she reported to Dr. Pinder may have resolved over time without any steps beyond rest. This is not a situation such as that in *Guay v. Wong* where other therapies had been tried and had failed to suppress pain symptoms. The alternative therapies that Dr. Henderson and

Dr. Carstensen suggested were not “fringe alternative[s]” or “alternative medicine practices” that need not be mentioned: *Seney* at paras. 57-58

[107] Therefore, this Court finds that Dr. Pinder failed to discharge his duty properly to inform Ms. Dickson of the reasonable alternative therapies.

v. did an absence of informed consent lead to the SMT treatment?

[108] If the medical practitioner complies fully with their duty of obtaining an informed consent then this issue would be resolved. If, however, the medical practitioner failed in their duty to obtain an informed consent, the next issue is whether this failure led to the alleged injury, see e.g. *Raymor* at paras. 81, 88. Would a fully-informed patient accept the risks of treatment?

A. *legal principles*

[109] In *Snell v. Farrell*, [1990] 2 S.C.R. 311, 72 D.L.R. (4th) 289 at para. 26, the court described causation as follows:

Causation is an expression of the relationship that must be found to exist between the tortious act of the wrongdoer and the injury to the victim in order to justify compensation of the latter out of the pocket of the former.

There must be a causal link between Dr. Pinder’s wrongful act and the damage that Ms. Dickson suffered. When we deal with the failure of the medical practitioner to obtain an informed consent, that failure does not automatically cause the patient’s damage. Rather, it may be the reason why the patient opted for a particular treatment that caused the damage; the failure of the medical practitioner to obtain an informed consent is but one link in the causal chain.

[110] *Reibl* is the starting point for this analysis. In that case, the court adopted a “modified objective” test when it conducted its analysis of this issue. The *Arndt* court summarized the *Reibl* test when it said at para. 6, “It requires that the court consider what the reasonable patient in the circumstances of the plaintiff would have done if faced with the same situation.”

[111] A medical practitioner may obtain the patient’s informed consent expressly, through the patient’s signing of a written document or by orally consenting to the treatment, or impliedly, through the patient’s actions (or inaction, in some cases), see e.g. *Mitchell v. McDonald* 1987 CarswellAlta 133, 53 Alta. L.R. (2d) 46 at para. 96 (Q.B.); *Heughan* at paras. 164, 166, *Loffler* at paras. 218-219. The *Mitchell* court felt that a patient could so consent, when it said at para. 96:

I am further fully satisfied that the plaintiff came to the defendant’s clinic ... with the clear expectation that she was going to be treated ... I have no doubt at all that the plaintiff impliedly consented to the procedures that were performed by the defendant and, indeed, fully expected them.

[112] The court may consider whether the patient has some familiarity with the proposed treatment and with the fact that the medical practitioner requires a consent before undertaking any such medical treatment, see *e.g. Olsen* at para. 121; *Mitchell* at para. 96.

[113] This Court may not, however, draw inferences in the absence of evidence. Nor may it bridge, by way of inference, a gap in the evidence, *Kozak v. Funk* (1997), 158 Sask. R. 283, 76 A.C.W.S. (3d) 454 (C.A.) at para. 22.

B. Ms. Dickson's testimony

[114] Aspects of Ms. Dickson's medical history were put into evidence, and she testified as to her previous choices regarding medical care and, in particular, surgery. During her adult life, Ms. Dickson had several operations, many of which required her to be under a general anaesthetic. In those cases she signed an informed consent form.

[115] Ms. Dickson testified, however, that in two of the cases where she needed surgery (an emergency Caesarian section, and an operation for the removal of a cyst and dilation and curettage), she did not feel she had a choice but to sign the forms. She saw no other alternatives.

[116] In another instance, she had laparoscopy surgery, which was not life threatening. Ms. Dickson acknowledged that, in that case, she signed the informed consent form and the attending physician had explained the risks of surgery to her and responded to her questions before she signed the form. As well, she had hernia surgery in which she acknowledged that she understood the nature of the procedure and its risks.

[117] For her other surgeries, Ms. Dickson was not able to recall whether the attending physician discussed the risks with her before she signed the informed consent form, although she agreed that the physicians "probably" discussed the risks with her.

[118] There was, however, another instance where Ms. Dickson did not choose surgery. When she was 28 years of age, Ms. Dickson went to the hospital to obtain help for her weight. The recommended non-surgical approaches were not successful. She then contemplated a surgical remedy for weight loss, but chose against this option after speaking with Dr. Salmon, the doctor who would perform the surgery. He discussed with Ms. Dickson the risks of the surgery and she understood that there could be complications, including death, with this surgery and any surgery that involved a general anaesthetic.

[119] Ms. Dickson was in considerable pain when she visited with Dr. Pinder on February 14, 2002. This was not a transient discomfort, as this Court found that she attended on Dr. Pinder's office the day before her scheduled appointment.

C. analysis

[120] This Court finds that Ms. Dickson would have consented to the SMT even if Dr. Pinder had explained in more detail the risk of stroke, the nature and effects of a stroke, and the alternative treatments for her condition. Ms. Dickson had previously seen her (non-chiropractic) physician for her headaches and neck pain. These problems continued, so it was reasonable that she would investigate an alternative source for her relief. Mr Maschmeyer provided Ms. Dickson with a favourable “review” of Dr. Pinder’s treatment ability and she was satisfied that Dr. Pinder could solve her head and neck pain. She was in pain and wanted her problem resolved. She did not wait until her scheduled appointment but instead first arrived the previous day. This strongly suggested she wanted immediate treatment for her pain.

[121] This Court also finds that Ms. Dickson did not have any fear of medical practitioners. In fact, the opposite is true. In certain instances, she chose surgery, while in another instance she rejected that option. These choices are consistent with a reasonable approach to medical therapy that balanced the severity of biological dysfunctions with the risks of therapy. Medical treatment was not uncommon to Ms. Dickson and she received successful treatment for her other maladies. She trusted her medical practitioners.

[122] Ms. Dickson remains somewhat flippant concerning her risk of stroke, despite the fact that she has already had one. Ms. Dickson testified that she is aware that smoking cigarettes increases her risk of stroke, yet she continues to smoke. When presented with a cigarette package which states that a person’s risk of stroke increases with smoking, she testified that she was aware of that warning label on the package.

vi. informed consent - conclusion

[123] This Court concludes that even though Dr. Pinder did not meet the required standard of care when he informed Ms. Dickson concerning the proposed SMT, its consequences and alternatives, she would still have consented that treatment. Phrased differently, Dr. Pinder’s negligence in this regard was not the cause of Ms. Dickson’s injury, because no matter what he said to her, she would have consented to the SMT.

vii. negligent treatment

[124] The second aspect of the standard of care is examined by asking whether Dr. Pinder met this standard when he performed the SMT on Ms. Dickson.

[125] Negligent treatment may have occurred because:

1. Dr. Pinder was negligent in his diagnosis of Ms. Dickson’s condition, or
2. Dr. Pinder was negligent when he performed the SMT on Ms. Dickson.

This Court will examine each of these.

A. *party testimony and expert evidence as to the consultation and therapy*

[126] As mentioned earlier, Ms. Dickson testified that her memory was not as crisp after her stroke as before. She remembered some specific details as to what happened the day she visited Dr. Pinder, but she did not remember others. While she was in Dr. Pinder's examination room, Ms. Dickson testified that Dr. Pinder tried different manoeuvres to try to resolve her neck pain and headaches. He tried manoeuvring her elbows and leaning on her legs. He then placed her on her back on the examination table where he was moving her head from side to side, trying to get her to relax. One of his hands was on her chin and the other was on the back of her head. She testified that Dr. Pinder told her that she was having a difficult time relaxing. He then "snapped" her neck. Ms. Dickson testified that the crack was loud and she was very sore afterwards.

[127] Ms. Dickson reports Dr. Pinder seemed frustrated during the examination and therapy. She provided no details as to why Dr. Pinder seemed frustrated.

[128] Ms. Dickson did not know that Dr. Pinder was going to manipulate her neck and it came as a surprise to her. After Dr. Pinder performed the SMT, she was sore, but not in pain. It was not the same soreness she had in her neck region before she went to see Dr. Pinder. She obtained some relief from the pre-treatment pain she was feeling on the right side of her neck.

[129] Dr. Pinder did not recall many details of Ms. Dickson's visit, which means that his normal procedures during consultation and therapy are relevant. This Court earlier discussed its use of Dr. Pinder's "invariable practise" and applies those principles in the discussion that follows. As well, Dr. Pinder's chart notes relate to his diagnosis and provide us with evidence concerning the diagnostic steps he took and the conclusions he reached.

[130] After Dr. Pinder entered the examination room, he would go through the Confidential Patient's Personal Record with the patient and write down any "significant things." Ms. Dickson presented to Dr. Pinder with a headache and upper back and neck pain. Dr. Pinder's Case History form on Ms. Dickson says that the pain started about 3 days before Ms. Dickson attended at his clinic. There was nothing that caused this pain, such as an accident or vigorous activity; it just started. The Case History form also stated that this type of pain occurred approximately once every six months and had been so doing for about five years. The pain was dull and constant and Ms. Dickson had not seen a physician for this particular episode of pain.

[131] Dr. Pinder's usual practice would be to undertake a physical examination, which consisted of taking the patient's blood pressure, doing a range of motion test and undertaking an orthopaedic and neurological examination. He would report his findings on a Chiropractic Physical Examination form. Dr. Pinder recorded Ms. Dickson's blood pressure as 135/84 and her pulse was normal for her age. Her range of motion in her neck region was normal. Dr. Pinder did not ask Ms. Dickson whether she smoked or whether she had other cardiovascular risk factors. He was certainly aware that she was obese.

[132] Part of his physical examination consisted of Dr. Pinder palpating the area in question which, in this case, was Ms. Dickson's neck. Palpation would allow Dr. Pinder to identify any muscle tightness or inflammation of the lymph nodes (adenitis). Dr. Pinder would undertake static palpation and motion palpation. He denies lifting Ms. Dickson's elbows. He might have contacted her elbows to undertake the motion palpation, moving her in a left to right motion. He also denied that he had any contact with her chin.

[133] His neurological examination would consist of testing the patient's deep tendon reflexes. If the patient presented with dizziness, Dr. Pinder would undertake a "Romberg test" which tests the patient's balance and, if positive, the possible cause of the dizziness. Because this was a neck problem, Dr. Pinder also undertook a foraminal compression test to see if the patient had any radiating pain, which might be the result of an intervertebral disc problem. He also conducted an Adson's test to determine whether the patient had a thoracic outlet compromise and Houle's test to determine whether the patient's vascular or cerebral arteries were being inhibited. Although the latter test has been proven ineffective, some chiropractors used this test in 2002. If the patient showed problems in any of these areas, Dr. Pinder would not see this as a chiropractic problem and he would refer the patient elsewhere. In Ms. Dickson's case, the tests were negative because, Dr. Pinder testified, he would have recorded any positive results in her chart.

[134] Following this testing, Dr. Pinder's standard procedure was to establish his diagnosis and suggest chiropractic treatment, if that was a solution. He would then go on to explain the risks.

[135] Dr. Pinder's diagnosis was that Ms. Dickson's sixth cervical ("C6") vertebra was out of place, slightly backwards (posterior) and slightly to the right. When she was lying down (supine), he found that his initial diagnosis changed, in that he noted that her C6 vertebra was slightly left. He did this through motion palpation while Ms. Dickson was supine. He found the same with respect to her C4 vertebra. As well, the C6 and C4 vertebrae and the cervical thoracic vertebra were not moving smoothly. They were "fixated," which caused a tightening of muscles and, as a result, a headache in the back of Ms. Dickson's head (the suboccipital region), which Dr. Pinder recorded on Ms. Dickson's chart.

[136] Dr. Pinder did not consider whether Ms. Dickson's symptoms could be related to vascular injury, although he did acknowledge that Ms. Dickson's symptoms could indicate a vascular injury. A vascular injury could cause muscle spasms which would result in pain. Dr. Pinder observed and determined that Ms. Dickson had none of the "5Ds and 3Ns" being, dizziness, diplopia, dysphasia, dysarthria, drop attacks, numbness, nausea, nystagmus, which would indicate vascular injury.

[137] Dr. Pinder used SMT when he adjusted Ms. Dickson's neck. This is a high velocity, low amplitude technique, meaning that the chiropractor applies a quick thrust to the joint, but the range of movement between the start point and the end point is very small. The chiropractor isolates the joint on which to apply the SMT. Dr. Pinder would put pressure on the specific vertebra with his fingertip, the patient would feel a little tenderness and might hear a popping sound (cavitation). Dr. Pinder had been using SMT for over 27 years. He also stated that he

would not offer a patient SMT if the patient had a condition that would make SMT inadvisable (a contraindicator), such as arthritis or a tumour.

[138] Dr. Pinder did not recall any difficulty in performing the SMT on Ms. Dickson. In fact, he testified that obese patients are usually easier to manipulate than young athletic ones because they do not have the same muscle tone. He said, however, that obese patients might feel a little uncomfortable, because the chiropractor must exert force through the fatty tissue to reach the vertebra.

[139] Dr. Carstensen described what is known as a “master cervical adjustment” in which the chiropractor moves the patient’s whole head. Dr. Pinder testified that he has never performed that adjustment on anybody, “ever.” He described a master adjustment as “a frightening form of adjustment,” (Transcript of Proceedings, vol. 5 (24 November 2009) at 00143, l. 17).

[140] As for Ms. Dickson’s allegation that Dr. Pinder was frustrated, he denied this. He testified, “I don’t remember being frustrated and because she’s a big woman, I have other large patients and they aren’t frustrating,” (Transcript of Proceedings, vol. 5 (24 November 2009) at 0146, ll. 18-20).

[141] Drs. Carstensen and Henderson commented on Dr. Pinder’s diagnosis and records, and the SMT he administered. In particular, they provided detailed commentaries on Dr. Pinder’s records, both in what Dr. Pinder should have detailed in those records and their interpretation of the information that Dr. Pinder recorded.

[142] With respect to Dr. Pinder’s chiropractic records, Carstensen’s Report noted the following:

- (a) Dr. Pinder did not inquire whether there were any palliating and provocative factors that would explain her pain symptoms or whether she was suffering any radiating symptoms. These are “notably absent from Dr. Pinder’s records,” Carstensen’s Report at para. 10;
- (b) by 2002, Houle’s test was recognized as “having poor predictive value and [was] eventually abandoned,” Carstensen’s Report states at para. 12
- (c) motion palpations to determine intersegmental motion restrictions “are not definitive for any demonstrable pathology and this technique is known to have poor inter-examiner reliability” and that these interpretations are “subjective,” Carstensen’s Report states at para. 13; and
- (d) the difference between the treatment record and the examination reference with respect to the diagnosis of the C6 vertebra, Carstensen’s Report at para. 15.

[143] With respect to the discussion of the risks and benefits of treatment, Carstensen's Report at para. 17 noted the differences between Dr. Pinder's testimony and Ms. Dickson's testimony in their respective examination for discovery transcripts.

[144] On these issues, Henderson's First Report concluded that:

- (a) Dr. Pinder's clinical approach appeared to be consistent with what is taught at an accredited chiropractic college in Canada and in keeping with recommended clinical guidelines;
- (b) Dr. Pinder's treatment was consistent with that of an average, prudent chiropractor practising in Canada in 2002;
- (c) Dr. Pinder's treatment of Ms. Dickson was reasonable and did not fall below the expected standard of care; and
- (d) overall, Dr. Pinder's chiropractic care and treatment of Ms. Dickson were provided in a manner that met the standard of knowledge, skill and care expected of a chiropractor practising in Canada in 2002.

[145] Henderson's Second Report reviewed Ms. Dickson's case history and Dr. Pinder's physical examination of her. It concluded:

The precise location of segmental stiffness is the goal of motion palpation to which Dr. Carstensen describes as "subjective interpretations" (not unlike palpation in medical practice) and "not definitive for any demonstrable pathology". In general practice, the diagnosis of headache; particularly tension headache, is rarely supported by strong objective evidence and despite this, a great number of medications are prescribed as treatment. In the case of chiropractic practice, the practitioner strives to locate the segmental restriction (tense or tight painful areas described by the patients) and mobilize the area with a stretch-like exercise, i.e. mobilization or manipulation. It is acknowledged that in determining the cause of a patient's presenting complaints, the practice and procedure of any health discipline is not a precise or exact science.

Accordingly, Carstensen's Report did not change Dr. Henderson's opinions.

[146] At the beginning of this trial, Dr. Pinder performed SMT on another chiropractor as a demonstration, for the benefit of this Court. Dr. Pinder's demonstration was recorded and the parties provided this Court with a digital video disc (DVD) of the demonstration. As well, most of the experts viewed the DVD. The experts who viewed the DVD agreed that the SMT, as demonstrated by Dr. Pinder, met the standard of care that would be exercised by a normal, prudent and reasonable chiropractor under like or similar circumstances and with the same experience and training.

B. *analysis*

I. diagnosis and record taking

[147] Before Dr. Pinder performed the SMT, did he obtain sufficient information from Ms. Dickson concerning her problems? In other words, did he make a proper diagnosis of her problems? To do this, Dr. Pinder had to obtain Ms. Dickson's medical history, undertake appropriate tests including a clinical examination, use available scientific equipment and facilities if necessary, be cognizant of Ms. Dickson's complaints during treatment and refer Ms. Dickson to other professionals, as he saw necessary, *Scott v. Mohan*, [1993] A.J. No. 592 (QL), 142 A.R. 281 at paras. 53-54 (Q.B.); *Thibert v. Zwa-Tun*, 2006 ABQB 423, 64 Alta. L.R. (4th) 41 at para. 111. A failure in this regard may itself be negligent, *Thibert* at para. 112.

[148] In part, to consider this issue, we must look Dr. Pinder's chart and how he created that chart. The court in *Waap v. Alberta* at para. 10 said [citations excluded]:

... [T]he law accords a special status to contemporaneous chart entries. Hospital records, including physicians' and nurses' notes can be received in evidence as *prima facie* proof of the facts stated therein. The case law allows a court to conclude that the absence of contemporaneous chart entries at crucial points permits the inference that nothing was charted because nothing was done. However, this is neither a rule of law nor an automatic conclusion: it is an inference which may only be drawn if supported after a careful weighing of all the evidence.

See also *Finch* at para. 20. Importantly, the *Waap* court continued at para. 11, the medical practitioner "is entitled to tell the court what the notes mean to him, to testify about his usual practice, and if he has an independent memory of events, to give the evidence."

[149] A paucity of notes can severely hamper the medical practitioner's defence and, as the *Waap* court said, a court can draw adverse inferences from a lack of notes; see *e.g. Gemoto v. Calgary Regional Health Authority*, 2006 ABQB 740, 67 Alta. L.R. (4th) 226 at paras. 45-48. As the *Adan* court said at para. 33, "in the absence of appropriate notes, a physician is normally quite hampered in re-constructing events such as these and runs the risk of being met with a different account." In other words, the medical practitioner might be faced with a "credibility contest." As well, if the medical practitioner does not make chart entries contemporaneously with their crucial findings, a court may draw the inference that the medical practitioner found nothing or nothing was done, *Joseph Brant Memorial Hospital v. Koziol*, [1978] 1 S.C.R. 491, 77 D.L.R. (3d) 161.

[150] However, even if the medical practitioner kept incomplete or inaccurate notes, this does not, *ipso facto*, result in an automatic finding of negligence, if the notes or lack of them were not

a cause of the plaintiff's damage, *Olsen* at para. 36. Incomplete or inaccurate notes are not the *sine qua non* in a negligence action. As stated in *Penner* at para. 28:

What is important ... is whether or not the diagnostician succeeds in ascertaining the source and nature of the illness or injury from which the patient suffers. In doing so, a practitioner naturally and properly follows the methods characteristic of the school of health care of which he is a member; therefore, it is by the methods and practices which characterize his school that he must be judged in determining whether or not he was negligent in his diagnosis.

[151] Similarly, the *Loffler* court said at para. 156:

I do not accept the Plaintiff's argument that the lack of appropriate charting will necessarily draw inferences that the Defendant failed in other duties to his patient. Deficient charting is only relevant if there is evidence that a failure to chart had a causative effect in the outcome.

[152] The *Loffler* court at para. 164 went on to say that any conclusion as to a medical practitioner's testimony concerning diagnostic procedures is fundamentally a question of credibility:

... [T]he existence of chart notes is not a prerequisite for a finding of invariable practice. The cases suggest that it is the credibility of the medical practitioner which is the determinative factor in establishing invariable practice. Although credibility can be bolstered by a chart corroborating oral testimony as to what one's standard practice entails, a poor chart does not deprive a medical practitioner of the ability to rely on his or her standard practice.

[153] As with *Olsen*, the College of Chiropractors of Alberta never took issue with Dr. Pinder's practice, including his method of record keeping. Neither expert provided any serious objection to Dr. Pinder's note-taking practice. Nor was there any evidence that Dr. Pinder had conducted himself in an atypical manner when he interviewed, diagnosed and treated Ms. Dickson.

[154] On that basis, this Court concludes that it can rely on Dr. Pinder's notes, supplemented by his testimony, as to what transpired during his examination and diagnosis of Ms. Dickson's condition. Neither counsel nor the experts identified any point where Ms. Dickson's testimony indicated a significantly different sequence of events.

[155] Carstensen's Report identified a number of what it considered to be shortcomings in Dr. Pinder's diagnostic approach. Dr. Henderson, on the other hand, concluded Dr. Pinder had used an appropriate diagnostic methodology.

[156] This Court finds that Dr. Pinder met the standard of care, diligence, judgment and skill that a normal, prudent or reasonable chiropractor under like or similar circumstances and with

the same experience and training would exercise when he undertook his examination of Ms. Dickson and arrived at a diagnosis concerning her maladies.

II. the SMT

[157] Did Dr. Pinder negligently conduct the SMT? No one, other than the parties, witnessed Dr. Pinder's application of the SMT on Ms. Dickson. Thus, this Court must assess the credibility of the two witnesses to decide whether, in its view, Dr. Pinder applied the SMT negligently. Furthermore, other than with respect to a couple of specific matters, Dr. Pinder did not remember Ms. Dickson, so this Court must again rely on Dr. Pinder's usual mode of practice and, if credible, Ms. Dickson's recollection of the events.

[158] In *Raina v. Shaw*, 2006 BCSC 832, 150 A.C.W.S. (3d) 1137 at para. 67, the court provided the following quotation from *Faryna v. Chorny*, [1952] 2 D.L.R. 354 at 357 (B.C.C.A.):

The credibility of interested witnesses, particularly in cases of conflict of evidence, cannot be gauged solely by the test of whether the personal demeanour of the particular witness carried conviction of the truth. The test must reasonably subject his story to an examination of its consistency with the probabilities that surround the currently existing conditions. In short, the real test of the truth of the story of a witness in such a case must be its harmony with the preponderance of the probabilities which a practical and informed person would readily recognize as reasonable in that place and in those conditions.

[159] Is Ms. Dickson's report of the event accurate? The difficulty for Ms. Dickson is that her visit with Dr. Pinder occurred almost eight years before this trial commenced. Without making notes or recording her narrative of the events immediately or soon after her visit with Dr. Pinder, one can hardly fault Ms. Dickson for not having a perfect recollection of the events. As well, Ms. Dickson acknowledged that her memory has been impaired since her stroke.

[160] Dr. Pinder testified that the SMT he demonstrated on the DVD was the same technique he had been trained to do and was the technique he used on Ms. Dickson on the day in question. Ms. Dickson's explanation of Dr. Pinder's examination of her and his performance of SMT is highly improbable. This Court finds that Dr. Pinder did not perform a "master cervical adjustment" and accepts Dr. Pinder's testimony that he has never performed that adjustment on anybody, "ever." This type of adjustment would be "a frightening form of adjustment," to any practical and informed person, as it does not isolate any particular area of the neck or head.

[161] It is equally unlikely that Dr. Pinder was frustrated with Ms. Dickson. We are dealing with a chiropractor who had 27 years of experience at the time he met with Ms. Dickson. Even if Ms. Dickson was not able to relax her neck, this Court finds that Dr. Pinder would not attempt to use force when he performed the SMT.

[162] This Court cannot rely upon Ms. Dickson's recollection of events and consequently she has failed to discharge the onus of proof cast upon her, *T.G. v. Boutros*, 2009 ABQB 651 at para. 56. This Court accepts Dr. Pinder's evidence of his invariable practice and accepts his evidence that he carried out the SMT in the way in which he was trained, and consistent with the manner in which he had performed this manoeuvre on patients for over 27 years. Neither Drs. Carstensen nor Henderson identified issues with Dr. Pinder's technique. This Court finds that Dr. Pinder did not breach his standard of care in this regard.

viii. conclusion in relation to negligence

[163] While Dr. Pinder breached his duty of care properly to inform Ms. Dickson, that breach is of no consequence. Ms. Dickson would have consented to the SMT, even if Dr. Pinder had informed her of all its risks and benefits and relevant reasonable alternative therapies. Dr. Pinder's failure to obtain an informed consent was not the cause of Ms. Dickson's injuries. As well, the manner in which Dr. Pinder diagnosed and treated Ms. Dickson was not negligent.

[164] Ms. Dickson must prove on a balance of probabilities, all elements of negligence to succeed in her chiropractic negligence claim against Dr. Pinder. She has not met this onus. If, however, this Court is incorrect in these findings, it must consider whether Ms. Dickson was injured, and whether Dr. Pinder caused her injury.

5. Whether Ms. Dickson Suffered an Injury or Loss

[165] No one questioned that Ms. Dickson suffered an ischemic stroke within the left lateral medulla.

6. Whether the SMT that Dr. Pinder Performed was the Actual and Legal Cause of Ms. Dickson's Injury or Loss

[166] Did the SMT cause Ms. Dickson's injury? The parties called experts to assist this Court in answering this question. This Court will review that testimony in relation to the kind of injury that Ms. Dickson suffered and how that injury might have been caused. It is important, however, to summarize what happened to Ms. Dickson.

a. The Nature of Ms. Dickson's Injury

[167] In the early morning hours after Ms. Dickson's visit with Dr. Pinder she arrived in the emergency room at the hospital in Fort Saskatchewan, Alberta. The emergency room physicians initially diagnosed her as suffering from a migraine headache. Later, on her insistence, they diagnosed her as suffering from a brain stem stroke. Ms. Dickson was then transferred to the University of Alberta Hospital.

[168] On her arrival at the University of Alberta Hospital, Ms. Dickson reported and exhibited symptoms consistent with dysfunction in the lateral medullary area of her brain. The medical

staff diagnosed Ms. Dickson as having suffered a stroke, a sudden impairment in brain function caused by the interruption of blood and nutrient flow to a part of her brain. There are two general kinds of strokes, those that result from a physical structure, such as a blood clot, being transported through blood vessels until it lodges and blocks an artery that supplies the brain, or those in which a haemorrhage occurs within the brain.

[169] In this instance Ms. Dickson reported symptoms consistent with an interruption in oxygen and nutrient supply to the left side of her brain. A computed tomography (“CT”) scan was conducted, which indicated that there was no haemorrhage (exploded blood vessel) which affected that area of Ms. Dickson’s brain. The alternative explanation was that some blockage had obstructed blood flow in Ms. Dickson’s brain.

[170] The treating physicians reached a diagnosis that Ms. Dickson had a blood clot that travelled through her bloodstream and lodged in a blood vessel within her brain. Thus, they treated Ms. Dickson with heparin, an anticoagulant (a material that prevents clot formation and thus, favours clot breakdown). Her condition stabilized.

b. Expert Testimony

[171] The expert evidence provided us with a background for interpreting the medical observations of Ms. Dickson. The experts also commented on the possible linkage between chiropractic treatment and strokes, from “epidemiological” and “biomechanical” perspectives. Dr. Pinder argued that:

1. no statistical (epidemiological) link exists between chiropractic treatment and strokes, and
2. the structural (biomechanical) characteristics of the human neck and the forces applied during SMT treatment are simply insufficient ever to injure the vertebral arteries.

Thus, Dr. Pinder could not have caused Ms. Dickson’s injuries.

[172] The experts also discussed the evidence on the state of Ms. Dickson’s circulatory system and, more specifically, on the origin and significance of a number of her apparent arterial abnormalities following her stroke. They commented on whether Ms. Dickson’s symptoms and those specific medical observations indicated that it was Dr. Pinder’s actions that caused her stroke, or that some other unrelated process was responsible.

i. chiropractic neck treatment and strokes

[173] The parties’ experts agreed on the mechanism that is believed to occur whenever chiropractic adjustments of a person’s neck leads to a stroke. The mechanism involves the vertebral arteries. The portion of the vertebral arteries in question in this case are located on

either side of the spine's cervical vertebrae. They are partially enclosed by those vertebrae in small loops of bone called the transverse foramina. The movement of the cervical vertebrae also causes movement of the vertebral artery. The vertebral arteries then enter the skull, where they fuse to form the basilar artery. The combination of the vertebral arteries and the basilar artery is referred to as the vertebrobasilar arterial ("VBA") system. A "vertebrobasilar stroke" is an interruption in blood flow to parts of the brain that the VBA system services.

[174] Ms. Dickson's experts opined that Ms. Dickson suffered dissections in her left vertebral artery. The first resulted from a flap-like tear in the structure of the vertebral artery. That damage may reduce blood flow through the vertebral artery and cause neck pain and headaches. Material that accumulates in the area of the dissection may become dislodged and move along the arteries leading to the brain, where it blocks a blood vessel and causes a stroke. The other dissection was a narrowing of the intracranial portion of the left vertebral artery.

[175] SMT involves manipulation of the cervical vertebrae. Ms. Dickson theorized that those adjustments could physically damage a vertebral artery, resulting in a vertebral artery dissection. As well, SMT could cause material to be released from a pre-existing vertebral artery dissection, which then moves up the vertebral artery into the brain and causes a blockage.

ii. epidemiological correlation of chiropractic therapy and strokes

[176] Dr. Pinder argued that where epidemiological evidence indicates that chiropractic treatment is not statistically associated with strokes, logically, his treatment of Ms. Dickson could not have caused her stroke.

[177] Dr. Cassidy is an epidemiologist, who holds a doctorate in that discipline from the Karolinska Institute in Stockholm, Sweden. Before he became an epidemiologist, Dr. Cassidy was a practising chiropractor who earned, among other things, a Ph.D. in anatomical pathology from the University of Saskatchewan. He held faculty positions at the Universities of Saskatchewan, Alberta and Toronto and is currently the Director of the Centre for Research Expertise for Improved Disability Outcomes at the Toronto Western Hospital. He has published extensively in peer-reviewed journals, the most important of which for the purposes of this case is J.D. Cassidy et al., "Chiropractic Care: Results of a Population-Based Case-Control and Case-Crossover Study" 33 Spine (No. 4S) S176-S183 and 17 Eur. Spine J. (Supp. 1) S176-S183 (the "Cassidy Study").

[178] This Court qualified Dr. Cassidy as an expert to provide this Court with evidence on epidemiology and chiropractic, including, (a) the cause of neck pain, stroke and associated disorders, (b) the association between chiropractic treatment and stroke; and (c) the risks and outcomes of chiropractic care.

[179] Dr. Cassidy provided this Court with a *Rule* 218.1 report dated July 21, 2009 ("Cassidy's First Report"). The Cassidy Study was the primary basis for Cassidy's First Report. The Cassidy Study was a population-based study in which the researchers merged data from the Ontario

Health Insurance Plan (“OHIP”) database with the Discharge Abstract Database (“DAD”) from the Canadian Institute for Health Information. The OHIP database captured outpatient visits to chiropractors and primary care physicians, and the DAD captured hospital visits for VBA strokes over a 9-year period.

[180] The Cassidy Study’s purpose was best described in Cassidy’s First Report at 3, when it said:

Our study was designed to investigate the association between chiropractic care and stroke and to compare this to the association between physician care and vertebrobasilar artery (VBA) stroke. The rationale for this approach is that we know that the main precursor for chiropractic-related VBA stroke is vertebral artery dissection, and that the early symptoms of vertebral artery dissection include neck pain and headache. It has been alleged that chiropractic manipulation can tear the vertebral artery, which leads to a thrombus (clot) that can embolize (thromboembolic event) and block the VBA leading to ischemic stroke of the posterior brain and/or brainstem. We hypothesized that patients with dissection-related neck pain and headache may present to chiropractors or primary care physicians (PCP) because of neck pain and/or headache, and that this care is coincidental to an ensuing VBA stroke. Evidence that chiropractic care increases the risk of VBA stroke would be present if the measured association between chiropractic visits and VBA stroke exceeded the measured association between PCP visits and VBA strokes. Since we do not believe that physician care causes VBA strokes, any association between physician visits and VBA stroke could serve as a measure of the coincidental risk, or non-causal association, and that care is not in the causal chain of events.

[181] The Cassidy Study’s conclusion was set forth in Cassidy’s First Report at 5:

...[P]atients with neck pain and headache related diagnoses are at greater risk for VBA stroke after seeing both primary care physicians and chiropractors.

Overall, our results confirm our hypothesis that the association between chiropractic care and VBA stroke is explained by patients with dissection-related neck pain and headaches seeking care prior to their thromboembolic event and subsequent VBA stroke. Since these associations are similar for both PCP visits and chiropractic visits, there is no excess risk attributable to chiropractic care.

[182] Cassidy’s First Report at 9 concludes that, from an *epidemiological* perspective, Ms. Dickson’s stroke was not caused by Dr. Pinder’s chiropractic treatment and the temporal connection between Ms. Dickson’s stroke and the chiropractic care is coincidental. As well, Cassidy’s First Report concludes at 11, that Dr. Pinder’s chiropractic treatment did not contribute to the onset or severity of Ms. Dickson’s stroke.

[183] Dr. Cassidy made it clear while he was testifying that neither he nor the Cassidy Study was providing an opinion on what caused Ms. Dickson's stroke. Dr. Cassidy testified that the Cassidy Study was intended to provide this Court with an opinion on the *likelihood* that Dr. Pinder's chiropractic treatment caused Ms. Dickson's stroke, based on a population-based study. Based on the Cassidy Study, however, Dr. Cassidy testified that unless something in the evidence changes his opinion, his opinion always would be that chiropractors do not cause strokes. This thought process is in keeping with the British Columbia Supreme Court, when it was ruling on the admissibility of the evidence of certain experts in the case *Taylor v. Liong*, 2007 BCSC 231, 70 B.C.L.R. (4th) 284 at para. 193, when it said:

... [T]he presence of a plausible theory for a cause and effect relationship does not establish such a relationship any more than the presence of a plausible method for building a house establishes the existence of the house. Some evidence must exist that is capable of supporting the existence of the relationship above and beyond its mere plausibility before consideration can be given to the process of determining that ultimate question.

[184] Stated differently, Dr. Cassidy concluded that his study did not detect an association between chiropractic treatments and strokes. This implies that chiropractic treatments do not cause strokes and, by inference, Dr. Pinder could not have caused Ms. Dickson's stroke.

[185] This Court qualified Dr. Adrian R.M. Upton as an expert in neurology, including causation in relation to stroke and the symptoms from which Ms. Dickson suffered. He is a neurologist who currently practices clinical neurology in Hamilton, Ontario. He is also a full professor at the McMaster University Medical Centre in Hamilton, Ontario, where he teaches neurology and was the department head for 25 years. He has published and presented many peer-reviewed journal articles, including articles involving neuroradiology, migraine and chiropractic therapy.

[186] Dr. Upton was satisfied with the findings contained in the Cassidy Study and described its findings as follows:

... [A]t least we know that chiropractors are not causing strokes because if the dislodged emboli, there should be more strokes in the chiropractic arm. And if they caused strokes and dissections, there should be more vertebrobasilar artery lesions in the chiropractic arm.

Dr. Upton's reference to "arm" means the chiropractic profession.

[187] During cross-examination, Dr. Upton conceded that Ms. Dickson had a *possible* dissection at the time she went to see Dr. Pinder. This Court expressed a concern to Dr. Upton that the Cassidy Study was a macro-study that does not help a physician (or this Court) in concluding whether Dr. Pinder caused Ms. Dickson's stroke, from a micro- or patient-specific perspective. Dr. Upton responded as follows:

A ... The point that you are making is a very good one. From a point of view of treatment, doctors treat the patient that's in front of you. They don't treat the statistics. They use the statistics to work out what the probability is that you're going to have problems, but they don't use statistics to treat you *per se*.

...

So somehow you have to take the patients together and look at what is the difference between this group of patients and this group of patients for a point of view of finding out what's happening. And that was what Cassidy did and that's what's important. So you are quite right to be concerned that statisticians come and tell you what the probability is. So it's like you being hit by a meteorite and the statistician comes and says, judge, you know you are very unlikely. Very small chance that you got hit by a meteorite but you say, yes, I was hit by one. Telling me it's rare doesn't help me at all.

So the point about the individual patient, the individual patient must be treated individually but the understanding of what the problem is has to be looked at from a point of view of statistics.

...

Q ... [I]s it possible that Ms. Dickson's situation falls outside of [Dr. Cassidy's] analysis? In other words, she was the one hit by the meteorite? Is it possible that she was the one that had the stroke as a result of manipulation?

A Your Honour, as I said earlier, as a physician I cannot tell you that something is not possible including being hit by a meteorite and the problem is that ... Dr. Cassidy's study shows that the probability that Mrs. Dickson was a victim of that event is incredibly improbable and that's the best I can do in helping the Court make a decision. I cannot say that it absolutely couldn't happen, but I can say I don't see that the probability is there and the results that Cassidy obtained allowed him to give a probability which was really very low.

[188] When he was questioned as to whether in his opinion SMT cannot cause stroke, Dr. Upton responded by saying, "a scientist can never say something cannot happen. We can only say it's improbable ..."

[189] Dr. Andrew Woolfenden is a neurologist, who practices clinical general and cerebrovascular neurology in Vancouver, British Columbia. He also teaches at the University of British Columbia Medical School and conducts stroke research. He has published and presented

peer-reviewed journal articles on cervical artery dissection and has diagnosed and managed over 200 patients with cervical artery dissection. This Court qualified him as an expert in the areas of ischemic stroke and cervical artery dissection.

[190] Dr. Wolfenden prepared two reports for this Court. In his report dated September 18, 2009 (“Woolfenden’s First Report”), he noted that the Cassidy Study correctly concluded that it could not rule out neck manipulation “as a potential cause of some vertebrobasilar strokes,” Woolfenden’s First Report at 9. Woolfenden’s First Report stated that the reason why the Cassidy Study came to this conclusion is that it “did not specifically locate each individual case of vertebrobasilar stroke due to dissection to look for supportive evidence of causation.” Woolfenden’s First Report concluded that “the clinical details of Ms. Dickson’s case support the causal relationship of her cervical manipulation and left vertebral artery stroke.”

[191] Dr. Cassidy prepared a second report dated October 18, 2009 (“Cassidy’s Second Report”), in response to Woolfenden’s First Report. Cassidy’s Second Report at 2 says:

[I]t is more useful to view causation within the model of sufficient cause, necessary cause and component cause. Chiropractic care is neither a sufficient cause or necessary cause. If it were sufficient, every time a chiropractor treated a neck it would result in VBA stroke. If it were necessary, there would be no VBA strokes without chiropractic care. If it were a component cause (part of a multicausal series of events) then the risk of VBA stroke associated with chiropractic care would exceed that associated with primary care, and it doesn’t.

[192] Cassidy’s Second Report also specifically addresses the issue that Woolfenden’s First Report raised that the Cassidy Study cannot rule out that chiropractors cause VBA strokes. Cassidy’s Second Report goes on to say at 3:

However, this would only hold true if family doctors also somehow cause VBA strokes, and I don’t think they do. If chiropractors cause this type of stroke and family physicians don’t, then the association between VBA stroke and chiropractic visits would be stronger than the association between family physician visits and stroke and it isn’t.

[193] Dr. Woolfenden prepared a further report dated October 30, 2009 (“Woolfenden’s Second Report”). In response to Dr. Cassidy’s opinion that chiropractic care does not cause vertebral artery dissection, Woolfenden’s Second Report at 2 says [emphasis original]:

Causation does not imply that a factor *always* results in an outcome, nor does it assume that an outcome *always* arises from the factor. ... There are many causes of vertebral artery dissection. In my opinion, chiropractic treatment is likely one of the causes of vertebral artery dissection.

[194] With respect to the Cassidy Study itself, Dr. Woolfenden testified that it does not deal with the question that is before this Court, *viz.*, whether Dr. Pinder's treatment caused Ms. Dickson to suffer a vertebral artery dissection, which resulted in her stroke. Rather, the Cassidy Study looked at VBA stroke, of which one of the causes is vertebral artery dissection. Dr. Woolfenden testified that "the population that is being looked at is actually having strokes 80 percent of the time for reasons unrelated to dissection." Thus, Dr. Woolfenden concluded that, "it would be incorrect to use this paper as proof that chiropractic manipulation cannot cause stroke because that wasn't the purpose of the finding in the paper."

[195] During cross-examination, Dr. Woolfenden provided a further explanation which is essentially a "chicken and egg" hypothesis. He said that if a patient attends on their chiropractor or physician with dizziness or facial numbness, which are signs of a VBA stroke, and it is not recognized and the next day, that patient suffers a stroke, that patient would be counted in the Cassidy Study. Did the patient already have a stroke or did the physician or chiropractor cause the dissection which lead to the stroke? That is not clear.

iii. biomechanical characteristics of vertebral arteries

[196] Dr. Bruce Percy Symons practised as a chiropractor since 1997, when he graduated from the Canadian Memorial Chiropractic College. From 1997 to September 2000, Dr. Symons worked at the University of Calgary's Faculty of Kinesiology as a research associate under Dr. Walter Herzog. In September 2000, he started applying his research towards his Doctor of Philosophy degree. Dr. Herzog acted as his doctoral supervisor. For personal and family reasons, Dr. Symons did not complete his doctoral dissertation and he returned to full-time chiropractic in 2005. He intends to return to his doctoral studies in the fall of 2010. He has continued to work with Dr. Herzog as a research assistant.

[197] This Court qualified Dr. Symons as an expert to give evidence on the biomechanics of chiropractic manipulation of the cervical spine and the forces exerted on the vertebral artery and other arteries. It did not qualify Dr. Symons to give evidence on whether the forces may cause stroke, the risk factors of stroke, the incidence of stroke or the particular causes of Ms. Dickson's stroke.

[198] During his time working as a research associate, Dr. Symons published several papers as a co-author with Dr. Herzog and others. The most notable of those papers was a study involving SMT performed on 5 cadavers, which he published with Dr. Herzog in *Journal of Manipulative and Physiological Therapeutics* ("JMPT") (the "Cadaver Study"). The article, Bruce. P. Symons et al. "Internal Forces Sustained by the Vertebral Artery During Spinal Manipulative Therapy" (2002) 25(8) J.M.P.T. 504, reports on the study in which Dr. Symons simulated a SMT-type movement on the cervical spine of a cadaver and then observed the kinds of forces that were transmitted to the vertebral artery.

[199] Based on that research Dr. Symons prepared two expert reports. Dr. Symons' first report dated February 23, 2009 ("Symons' First Report"), described the forces and biomechanics of

SMT. It stated that the force chiropractors apply during SMT as “remarkably consistent,” in the range of 100-150 Newtons (N) of force over 150-200 milliseconds. Dr. Symons testified that this is a relatively minor force with a relatively small displacement. Symons’ First Report at para. 17, describes this force as “A light slap to the face is about 50-100 N, and a black belt in Tae Kwon Do exerts roughly 3,000 N with a karate chop to break a brick.”

[200] Symons’ First Report concluded that the force that Ms. Dickson’s vertebral artery experienced during the SMT should not have dissected her artery. It equated this motion to shoulder-checking or washing one’s hair.

[201] It is important to note that the Cadaver Study focused on the “stretching” of the vertebral artery to the point of tearing it. In other words, it was studying “shear stress” as opposed to “normal stress.” Shear stress measures stress parallel to the surface, whereas normal (or compression) stress measures stress perpendicular to the surface. The karate chop to the brick is normal (or compression) stress, whereas the stretching of a strand of spaghetti is shear stress. During his examination in chief, Dr. Symons described a further type of stress, being “torsion stress” This is stress exerted through twisting, which does not apply in this case.

[202] The reason why shear stress was relevant for the purposes of the Cadaver Study was that as one turns or rotates the head, this could pull on the artery or stretch it out. Dr. Symons described why a “normal” rotation of the head will not cause a tearing of the artery, as follows:

When you first look at the vertebral artery *in situ* as with the neck in neutral position, you will see that the VA [vertebral artery] itself is a little bit slack, which makes sense from an evolutionary point of view, because if it wasn’t slack, if the VA was taut, then as soon as you move your neck you create huge amounts of force on it. ... As you move your head and neck you take up a lot of this slack and blood vessel unwinds from various kinks because it is a bit kinked the whole way through.

[203] Dr. Symons acknowledged certain limitations to the Cadaver Study. First, he acknowledged that the physiology in a cadaver’s body differs from an *in vivo*, or live, body. For example, there is no blood in the cadaver’s vertebral artery, so in the cadaver that vessel is actually collapsed down. As well, the Cadaver Study did not measure the force that came from the chiropractor’s hand to the surface of the neck or the cadaver’s spine. Also, the Cadaver Study was undertaken on five cadavers, in which Dr. Symons studied six of their arteries. The “youngest” cadaver was 80 years old and the oldest 99 years old.

[204] Symons’ First Report concluded that, “the cervical spine manipulative treatment rendered by Dr. Pinder could not have caused the [vertebral artery] dissection experienced by Ms. Dickson,” Symons’ First Report at para. 35. During his examination in chief, Dr. Symons was definitive when he said

.. [B]ased on the research we have done that there's zero force felt by the vertebral artery, and that the hypothesis is the force will cause the tear, then if there is no force I would say there is no tear and I would have to say the probability is essentially zero.

[205] Dr. Symons, in his reports, provided this Court with few details of the limitations of the Cadaver Study. The Cadaver Study itself provides us with its numerous limitations.

[206] The Cadaver Study has been the subject of academic commentary and criticism. There have been numerous questions raised concerning the Cadaver Study through letters to the editor of the JMPT and no further research has been conducted to replicate and improve on the Cadaver Study.

[207] It is also important to note that Symons' First Report assumes that Ms. Dickson "did not have any specific arterial disease or collagen diseases that would predispose her to weakened or otherwise compromised" vertebral arteries and that she had "normal and healthy vertebral arteries," Symons' First Report at para. 28. Later in these reasons, this Court reviews evidence that Ms. Dickson had a number of known stroke risk factors, including her obesity, smoking and hormone use.

[208] During cross-examination, Dr. Symons admitted that he did not examine what was happening inside the blood vessel as he was stretching it. Thus, he could not provide any indication as to whether stretching was weakening the blood vessel. However, because of his conclusion that SMT was not applying force to the vessel, it would not weaken the vessel.

[209] This Court had a concern that SMT could cause compression force on a patient's vertebral artery at the point where the chiropractor applied the pressure. Recall that the pressure is somewhere between 100-150N. Dr. Symons responded with the following:

... [W]e estimated that about 2 percent of the force gets through, because the fat and the muscle and so forth will tend to absorb a lot of the force. So the force that gets right through to here I suspect is around 2 percent of the force. So I don't think direct force itself will harm the blood vessel, because it sits inside of – inside a bony canal here, so you'd have to penetrate through the bone to get to the blood vessel, which I don't think is possible.

[210] Dr. Symons' second report ("Symons' Second Report") concludes that "basic mechanical research also demonstrates that the force of 100-150 N generated by a typical cSMT is insufficient to cause any mechanical consequences to the [vertebral artery]," Symons' Second Report at 3. The rest of Symons' Second Report deals with matters outside his area of expertise.

[211] The Cadaver Study was dealing with the intracranial dissection Ms. Dickson allegedly suffered. Dr. Upton confirmed Dr. Symons' analysis that SMT could not dissect the intracranial vertebral artery.

[212] The Cadaver Study did not deal with the shelf-like dissection lower down in Ms. Dickson's vertebral artery. This explains why the Cadaver Study dealt exclusively with sheer force and not compression force. Although earlier, Dr. Symons provided this Court with the example of the karate chop to a brick as being compression force, later in his testimony, Dr. Symons provided an example of a more gentle form of compression force; the taking of a pulse. In most people, this procedure causes little or no damage.

[213] In summary, Dr. Symons concluded that because of the kinds of force applied to the vertebral artery during SMT, and the observed effect SMT had on cadavers' arteries, dissection could not occur in the intracranial portion of that blood vessel. The force was simply insufficient.

[214] Dr. Woolfenden criticized the Cadaver Study and its use of older cadavers for test purposes, as being not relevant to the patient population that usually suffered from vertebral artery dissection, which is the group under 45 years of age. Dr. Woolfenden also referred to MRI studies which show that there is arterial compression and other changes in the vertebral artery through neck rotation and extension. Unfortunately, Dr. Woolfenden did not provide this Court with those studies or their conclusions.

iv. Ms. Dickson's alleged injuries

[215] The parties called a number of experts who commented on Ms. Dickson's stroke and the factors and injuries that might have led to her condition. The experts focused on whether Ms. Dickson had a dissection of her vertebral artery, and if so, the cause of that dissection. There was no dispute among the experts that a dissection in the wall of that blood vessel *could* lead to a stroke. The question, however, was whether Ms. Dickson had a dissection at all.

[216] Ms. Dickson suffered two alleged dissections of her left vertebral artery. The first was in her V2 course, or close to the V1 and V2 course boundary, which is located in the area around the lower part of her neck in the area of her C5-C7 spine. The second possible dissection was in the V4 course, which is located intracranially (inside her skull). The experts commented on both of these possible arterial injuries.

A. Dr. Ashforth

[217] Dr. Robert Ashforth is a neuroradiologist, who is the Regional Clinical Coordinator of MRI with the Capital Health Authority in Edmonton, Alberta. He also teaches at the University of Alberta as an assistant clinical professor. He has completed post-graduate work in neuroradiology and diagnostic radiology and has published and presented peer-reviewed journal articles on, among other areas, CT angiography.

[218] Dr. Ashforth was the neuroradiologist who performed the angiography on Ms. Dickson when she arrived at the University of Alberta Hospital. He performed the catheterization and

injection of Ms. Dickson's left vertebral artery. This procedure was conducted to allow treating personnel to view the circulatory system in Ms. Dickson's head and neck and, specifically, whether she had any abnormalities or blockages in the apparently affected region.

[219] The parties agreed that Dr. Ashforth's report dated February 15, 2002 ("Ashforth's Report"), would be entered as an expert report on diagnostic radiology, even though Dr. Ashforth did not sign Ashforth's Report. Dr. Ashforth did not provide *viva voce* evidence.

[220] Ashforth's Report was brief, so select quotations in their entirety are as follows. Dr. Ashforth suspected that an abnormality located in the neck portion of the left vertebral artery was a dissection:

There is a shelf like defect in the medial aspect of the left vertebral artery at the C6-7 level. The appearance is highly suspicious for a small left focal vertebral artery dissection. There is no definite cephalad extension of this.

...

Probable focal dissection of the proximal left vertebral artery.

[221] Dr. Ashforth's Report also observed an unusual feature in the V4 (intracranial) course of that artery, but concluded that it was a narrowing of the left vertebral artery rather than an injury:

Moderate narrowing of the intracranial portion of the left vertebral artery is identified. I believe this is developmental rather than due to an intracranial vertebral artery dissection. No other abnormality is seen.

[222] Other experts provided evidence to add context to Dr. Ashforth's comments.

B. causes of arterial dissections

[223] The parties' experts agreed that there is no single process or kind of event that results in dissections in vertebral arteries.

[224] Was Ms. Dickson's vertebral artery dissected? Dr. Upton's first *Rule* 218.1 report is dated August 13, 2007 ("Upton's First Report"). Upton's First Report at para. B, states that Dr. Upton is "not convinced that we have clear evidence of a vertebral artery dissection" and that it would be rare for chiropractic manipulation to cause vertebral dissection, Upton's First Report at para. C.

[225] Upton's First Report at para. D, further opines that the most probable cause of Ms. Dickson's stroke was her multiple risk factors, which it earlier reported as being smoking, mild hypertension, obesity, borderline diabetes, migraine and use of contraceptive medication, Upton's First Report at para. 1. Dr. Upton confirmed these risk factors when he testified and he

added further risk factors, such as high cholesterol and use of estrogen. He also said that arterial problems could be hereditary or could be caused by atherosclerosis. Ms. Dickson was adopted when she was very young and knew little about her biological parents. Thus, we do not know whether hereditary factors play into this analysis. There was nothing to indicate that Ms. Dickson had symptoms of atherosclerosis. As well, Dr. Upton testified that a person could have a generalized blood vessel problem and in many persons under 45 years of age, their strokes are idiopathic; spontaneous or unexplained.

[226] Upton's Second Report challenged the conclusion that left medullary stroke is an indication of dissection, given that there are different causes of stroke.

[227] Dr. Woolfenden agreed that some dissections could be idiopathic. However, he pointed out that even in the case of idiopathic dissections, there could still be neck trauma, even minor neck trauma, like a cough or certain types of neck movement, like chiropractic manipulation, that causes the injury.

[228] Dr. Woolfenden agreed that Ms. Dickson possessed a number of general stroke risk factors, including her obesity, smoking, and prior estrogen use. He, however, disputed some of the other risk factors that Dr. Upton identified.

[229] Dr. Woolfenden testified that Ms. Dickson's chiropractic treatment was in close proximity to the development of her neurologic symptoms, Wolfenden's First Report at 9. Therefore, he saw a causal link among the vertebral artery dissection, ischemic stroke and Dr. Pinder's manipulation. He later testified, however, that the temporal aspect by itself is not sufficient to establish causation. However, in this case, he felt that it was a very important aspect.

C. alleged vertebral artery dissection in the neck

[230] Dr. Dominic Rosso is a neuroradiologist who is currently the Director, Interventional and Diagnostic Neuroradiology Program, Trillium Health Centre in Mississauga, Ontario. This Court qualified Dr. Rosso as an expert to give evidence in neuroradiology and the diagnosis of strokes from a neuroradiological perspective, including imaging of vertebral artery dissections and potential causes of those dissections.

[231] Dr. Rosso provided this Court with a *Rule* 218.1 report dated April 28, 2008 ("Rosso's First Report"). During his testimony, Dr. Rosso provided this Court with an explanation of the radiological procedures that were undertaken on Ms. Dickson. Catheter angiography or angiography is an invasive procedure that requires the radiologist to insert a guide wire into a patient's artery. The guide wire is worked up the patient's body until it reaches the blood vessel in question.

[232] Since x-rays do not usually show blood vessels, the radiologist uses the guide wire to insert a tube into the patient's body through which a dye flows. The dye is opaque to x-rays, so it

allows the radiologist to obtain an x-ray image of the subject's blood vessels. The dye permits contrast.

[233] The risks of angiography are bleeding or damage to the artery at the insertion point or to the blood vessels as the guide wire and catheter make their way through the patient's body. The damage to the blood vessels could result in a clot or embolus travelling through the blood vessel that could result in a stroke. Angiography can also cause a vasospasm, which is a contracting of the blood vessel on itself. This results from the guide wire, the catheter or the dye irritating the blood vessel. Dr. Rosso testified that once the radiologist removes the source of the irritation, the vasospasm will usually resolve itself.

[234] The radiologist takes x-ray images as the dye flows through the blood vessel. The images are of the lining of the blood vessel, so it shows the radiologist whether the blood vessel has an abnormality in that area. If the radiologist sees an abnormality, the radiologist must infer the cause of the abnormality. With respect to a dissection in the blood vessel, the radiologist looks for certain signs that will assist the radiologist in determining whether they are looking at a dissection, such as a luminal flap, a double lumen, a string sign or a pseudoaneurysm.

[235] Dr. Rosso testified that if a radiologist sees an abnormality in the blood vessel, it is incumbent on the radiologist to take as many images of the abnormality as possible from many different angles. This will assist the radiologist and others in making a diagnosis and designing a treatment plan. Because angiogram is such an invasive procedure, the radiologist does not want to subject the patient to further angiograms in a case where the radiologist does not do a thorough job in the first instance.

[236] Dr. Rosso critiqued Dr. Ashforth's conclusions with respect to Ms. Dickson's alleged injuries. Specifically, as to the alleged dissection at the V2 course, Rosso's First Report says at 5-6:

In my opinion, this study demonstrates an irregularity at the origin of the V2 course of the vertebral artery, and I can only really see this abnormality on one imaging plane. This abnormality is fairly smooth, and again is only seen on one plane. There is no objective evidence on any other plane to support this as a true finding.

...

If this lesion was a dissection, one would expect to see evidence of it on another imaging plane. In particular, one would expect to see a double density on the other imaging planes, or at least irregularities in that territory.

...

To summarize, there is a finding in the left vertebral artery at its V2 origin. For the reasons listed above, this does not support the diagnosis of dissection.

[237] A “double density” is an abnormality. Dr. Rosso explained the double density as a visual superimposition or overlap, and noted that one could only see this abnormality on one slide. Other slides that Dr. Ashforth took of the same region from different angles did not show this feature and, in fact, showed that the location of the double density as smooth, or normal. Dr. Rosso concluded on that basis that the abnormality did not exist. In other words, there was no dissection in Ms. Dickson’s V2 course.

[238] Dr. Alastair Buchan is the Dean of Medicine at the University of Oxford and is a professor of stroke medicine at that same institution. His post-graduate work was in the areas of neurology and surgery. Before returning to Oxford, Dr. Buchan conducted research and taught as a full professor in the Department of Neurology at the University of Calgary and was the Director of Stroke Program for the Calgary Health Region. He has published extensively in peer-reviewed journals and acted as an editor and reviewer for several different peer-reviewed journals. The parties agreed that Dr. Buchan’s report dated July 21, 2009 (“Buchan’s Report”), would be entered as an expert report on stroke neurology, including diagnosis and treatment of acute stroke. Dr. Buchan did not provide *viva voce* evidence in this trial.

[239] Dr. Buchan commented that “evidence of the shelf-like extension being the causal dissection is perhaps not the case and that this area of shelf-like disturbance actually relates to the instrumentation for the selective angiography.” In other words, Dr. Buchan believed that the putative vertebral artery dissection that Dr. Ashforth observed in the neck region was actually caused by the devices inserted into that artery, and not a consequence of the SMT.

[240] Dr. Upton also expressed caution in relation to the alleged dissection in the V2 course. He questioned why, if Dr. Ashforth indeed saw dissections, he did not take more slides to confirm the abnormality. Dr. Upton agreed that there appeared to be a shelf-like defect in the V2 course. He testified that this defect, if it exists, could have been caused by a catheter. However, he pointed out the uncertainty of Dr. Ashforth’s findings, when Dr. Ashforth noted that there is a “probable focal dissection.” As well, Dr. Upton interpreted the wording “highly suspicious” as being that Dr. Ashforth was not certain of the dissection.

[241] Wolfenden’s First Report stated that the irregularity at the V2 course is a dissection. Dr. Upton provided a further report dated October 20, 2009 (“Upton’s Second Report”). Upton’s Second Report disagrees with Dr. Woolfenden and provided the alternative explanation of catheter-induced vasospasm. Dr. Woolfenden opined that this irregularity looked more like a dissection and exhibited the clinical symptoms of a dissection more than it would a vasospasm.

[242] Dr. William Hu is a neuroradiologist practising out of the Foothills Medical Centre in Calgary, Alberta. Dr. Hu did not provide *viva voce* evidence in this trial, but he did provide this Court with two reports. Dr. Hu’s second report dated August 17, 2009 (“Hu’s Second Report”), states that a shelf-like irregularity involving the left vertebral artery at the V1/V2 junction, “would appear more likely than not” to “relate to the chiropractic manipulation.” Dr. Hu’s first report dated September 16, 2004, was entered as an exhibit in the trial of this matter with the parties’ consent (“Hu’s First Report”).

D. alleged intracranial artery dissection

[243] Dr. Ashforth concluded that Ms. Dickson did not have an arterial dissection inside her head. A number of the other experts agreed with that assessment.

[244] Dr. Upton agreed with Dr. Ashforth's belief that the moderate narrowing of the intracranial artery is "developmental" rather than a dissection. Thus, Dr. Pinder could not have caused it. He also noted that even if this abnormality was a dissection, intracranial arterial dissections most typically occur "spontaneously." That is, they are not associated with any particular physical event.

[245] Rosso's First Report also speaks of the alleged intracranial dissection, when it says at 4:

The intracranial left vertebral artery does show an irregularity in the distal left vertebral artery near the vertebral basilar junction. The clinical importance of this is difficult to define. This may be congenital.

The irregularity is a slight or mild narrowing. Dr. Rosso would not treat this, as the narrowing was less than 50 percent, in his opinion. To this extent, Dr. Rosso disagreed with Dr. Hu's observation that "there is a segment of more severe stenosis [narrowing] that likely measures around 50% maximally." Dr. Rosso testified that he "will not report a 50 percent narrowing. I will just say there was a mild narrowing or mild irregularity." As well, he pointed out that this abnormality in Ms. Dickson could very well be developmental.

[246] Despite Dr. Ashforth's interpretation, Dr. Woolfenden opined that the narrowing of Ms. Dickson's intracranial vertebral artery was a dissection and was not due to "any other arterial pathology," Woolfenden's First Report at 8. To this extent, Dr. Woolfenden disagreed with the conclusions that Dr. Ashforth, Dr. Upton and Dr. Rosso had reached.

[247] Buchan's Report came to a similar finding as did Dr. Woolfenden, when it said:

However, I do think there is evidence of dissection distally in the distal left vert intracranially, just prior to the PICA origin extending into the distal vertebral artery. There is some tapering which indicates dissection at the level that is compatible with a chiropractic induced dissection in the distal portion of the vertebral artery.

Interestingly, the Buchan Report does not provide us with the evidence to which it refers, nor why it considers this dissection to be chiropractically-induced. The only evidence is deductive, when it states, "There is no evidence of fibro muscular dyplasia, cystic medial necrosis, nor any other form of arteriopathy and the other arteries all look normal" and "the temporal relationship between the chiropractic manipulation (her first exposure to chiropractic manipulation) and the onset of the stroke is a matter of hours."

[248] The Buchan Report concludes with, “in my opinion, if [Ms. Dickson] had not had chiropractic manipulation, she would not have had a stroke on February 15, 2002.”

[249] Hu’s Second Report concluded with respect to the intracranial abnormality (the V4 course), “The finding would more likely than not represent a true acquired abnormality (i.e. not congenital) and would represent either dissection or changes from thromboembolus from a dissection” and “it is more likely than not, related to the chiropractic adjustment.”

[250] Dr. Hu’s conclusions drew critical commentary from a number of the expert witnesses. Dr. Rosso provided a further report dated September 23, 2009 (“Rosso’s Second Report”), in which Dr. Rosso comments on Hu’s Second Report. Rosso’s Second Report notes the rarity of dissections at the V1/2 levels and an intracranial dissection is even less common. Rosso’s Second Report concludes at 2:

[T]he question of probability and possibility comes into play. These two findings are extremely rare to be associated, if at all, with dissection from manipulation, and as such, this strongly supports that these findings are not related to any vascular injury from chiropractic manipulation.

[251] Dr. Symons also did not agree with Dr. Hu’s conclusion, from a physiological perspective. He said:

I don’t see how a manipulation performed that low down could pull the whole weight up into the brain and create a dissection there. ... I disagree with Dr. Hu’s opinion. I don’t think there’s an anatomic relationship at all.

Dr. Symon’s comments take into account the ‘slack’ that exists along the vertebral arteries, and how that would likely limit the transmission of force along those vessels.

[252] Upton’s Second Report came to a similar conclusion when it concluded “[i]t is most improbable that any intracranial dissection could be due to manipulation of the vertebral arteries in the neck. There is no probable mechanism for the production of such a dissection from manipulation of the neck.”

[253] Dr. Rosso, without mentioning Dr. Symons, also explained why from a physiological perspective a normal neck rotation does not cause intracranial dissection. He said, “you do not want the fragile arteries inside your brain being subjected to tension or rotation or movement. You want them protected so the physiology has been designed to do just that.” In other words, the cranial portion of the VBA system is anchored and comparatively immobile.

[254] Dr. Rosso also confirmed Dr. Upton’s comment that intracranial dissections are usually spontaneous. Some are related to significant trauma or degeneration of the arteries.

[255] Dr. Rosso also pointed out the inconsistencies in Dr. Hu's reports. In one, Dr. Hu states that the irregularity was related to catheter vasospasm and in the other, he states that the same irregularity was a dissection.

[256] Dr. Rosso referred to Ms. Dickson's intracranial abnormality as a narrowing; nothing more. In fact, Dr. Rosso referred to the treatment that Ms. Dickson received when she went to the University of Alberta Hospital Emergency Department. The emergency team treated Ms. Dickson initially as a dissection. He went on:

There may be a dissection at the base of the neck that then caused the blood clot to travel to the brain. They then started her on heparin which if that is correct is a very reasonable course of action.

However, if there is an intracranial dissection, if the dissection is inside the brain ... the artery system is significantly more fragile. So if there is a dissection that is produced this long narrowing that Dr. Hu mentions, what that means is that the artery of the brain has a channel in it that is exposed to blood pressure. Because now this patient is heparinized or on blood thinner, you have removed the major protective mechanism of solving that problem so it cannot clot. So that dissection, that false lumen will stay open. Each time her heart beat goes up, she has a heart beat, each time she raises her blood pressure, coughing, straining that false lumen would be exposed to a higher blood pressure. The probability of that very fragile artery extending the dissection or rupturing is very, very high.

So she actually has undergone her own experiment to prove whether she had an intracranial dissection. And my sense is that she did not worsen from this treatment.

[257] Dr. Hu did not provide this Court with the bases on which he came to his various conclusions. The way in which Dr. Hu arrived at his conclusions indicate to this Court that Dr. Hu was acting as an advocate for Ms. Dickson. Accordingly, where Dr. Hu's evidence conflicts with the other experts, this Court chooses to accept the evidence of the other experts.

c. Causation - Legal Principles

[258] What is causation? The Supreme Court of Canada in *Snell* at para. 26 tells us that, "Causation is an expression of the relationship that must be found to exist between the tortious act of the wrongdoer and the injury to the victim in order to justify compensation of the latter out of the pocket of the former."

[259] How does Ms. Dickson prove causation? *Snell* at para. 29 established the standard of proof that courts require when it said, "Causation need not be determined by scientific

precision.” In most cases, and certainly in this case, this Court does not have the expertise to determine causation without the help of experts. However, it is still this Court that must determine causation. The court in *Anderson v. McAndrew*, 2003 ABQB 13, 9 Alta. L.R. (4th) 143 at para. 58, aff’d 2005 ABCA 270, 53 Alta. L.R. (4th) 87 reinforced this responsibility when it said, “While expert medical evidence is very helpful to the unlearned trier of fact in [medical negligence] cases in determining causation, it is not conclusive.” *Snell* further tempered a court’s use of expert evidence when it said at para. 34:

It is not therefore essential that the medical experts provide a firm opinion supporting the plaintiff’s theory of causation. Medical experts ordinarily determine causation in terms of certainties whereas a lesser standard is demanded by the law.

That standard is the balance of probabilities. The plaintiff will not have met this standard by showing that there is a *possibility* of some causal connection, *Rothwell v. Raes* (1990), 76 D.L.R. (4th) 280, 2 O.R. (3d) 332 at para. 8 (C.A.) aff’d (1988), 66 O.R. (2d) 449, 54 D.L.R. (4th) 193 at para. 50 (H.C.J.), leave to appeal to S.C.C. refused (1991), 79 D.L.R. (4th) vii (note) (S.C.C.) .

[260] The parties in this case provided this Court with competing theories. Earlier in these reasons, this Court commented on its view of the “tie goes to the medical practitioner” approach. The Supreme Court of Canada rejected this approach in *St. Jean v. Mercier*, 2002 SCC 15, [2002] 1 S.C.R. 491. It said at para. 56:

A trial judge must reach a legal conclusion based on the scientific evidence and other evidence presented. Not to come to a definitive conclusion on a balance of probabilities amounts to an undue advantage granted to the defendant, who might simply need to come up with a plausible but contrary scientific theory in order to negative the plaintiff’s claim. ... It is an error of law in the analysis of causation for a trial judge to conclude that he or she does not have the authority to make a final legal determination in the face of competing theories.

[261] Practically, when courts are faced with conflicting expert medical evidence and none of the experts is in a position to provide the court with anything more than a “more likely than not” opinion, the court must still arrive at a conclusion. It may do so by taking the information that the experts provide, applying that information to the facts and circumstances it finds and drawing whatever reasonable inferences it considers appropriate to the matrix of information it receives, *Aristorenas v. Comcare Health Services* (2006), 83 O.R. (3d) 282, 274 D.L.R. (4th) 304 at para. 56 (C.A.). This is an application of the “robust and pragmatic approach” to which the *Snell* court referred at paras. 22-23.

[262] There are two ways in which the court can establish causation. The first is the “but for” test in which the plaintiff must prove that but for the defendant’s negligence, the plaintiff’s injuries would not have occurred, *Athey v. Leonati*, [1996] 3 S.C.R. 458, 140 D.L.R. (4th) 235 at para 14. The Supreme Court of Canada in *Resurfice Corp. v. Hanke*, 2007 SCC 7, [2007] 1 S.C.R. 333 at para. 21-22, confirmed that this is still the “basic test” and it “has never been displaced.” In this case, Ms. Dickson has the burden of proving that “but for” Dr. Pinder’s negligence she would not have suffered her stroke.

[263] The second is the “material contribution” test, that courts may use when the “but for” test is unworkable and where a contributing factor is material, in that it falls outside the *de minimis* range, *Athey* at para. 15.

[264] When would the “but for” test be unworkable? The *Athey* court provided us with no guidelines in this regard, but later cases have established that courts will apply the “material contribution” test in circumstances where the precise cause of the plaintiff’s injury or damage cannot be proven, *Cottrelle v. Gerrard* (2003), 67 O.R. (3d) 737, 233 D.L.R. (4th) 45 (C.A.) at para. 30. In *Aristorenas* at para. 53, the court said:

[I]t would seem that the “material contribution” test is applied to cases that involve multiple inputs that all have harmed the plaintiff. The test is invoked because of logical or structural difficulties in establishing “but for” causation, not because of practical difficulties in establishing that the negligent act was part of the causal chain.

[265] The *Hanke* court at paras. 24-25 expanded on this notion when it said:

[T]he cases in which the "material contribution" test is properly applied involve two requirements.

First, it must be impossible for the plaintiff to prove that the defendant's negligence caused the plaintiff's injury using the "but for" test. The impossibility must be due to factors that are outside of the plaintiff's control; for example, current limits of scientific knowledge. Second, it must be clear that the defendant breached a duty of care owed to the plaintiff, thereby exposing the plaintiff to an unreasonable risk of injury, and the plaintiff must have suffered that form of injury. In other words, the plaintiff's injury must fall within the ambit of the risk created by the defendant's breach.

See also *Nattrass v. Weber*, 2010 ABCA 64 at paras. 43-47.

[266] In this case, the fact that there are competing expert opinions on whether the SMT caused Ms. Dickson's stroke does not make proof of Dr. Pinder's alleged negligence impossible. It simply means there are conflicting theories.

[267] *Athey* is often cited as well for its discussion of the "crumbling skull" doctrine, which says that the defendant need not compensate the plaintiff for "any debilitating effects of the pre-existing condition which the plaintiff would have experienced anyway," *Athey* at para 35. A defendant need not put the plaintiff in a better position than the plaintiff's original position.

[268] Ms. Dickson raised the temporal connection between her receiving the SMT and the onset of her stroke as being evidence of Dr. Pinder's negligence. In *Anderson* at para. 65, the court said that "common sense might dictate that causation was proven without compelling scientific proof as one event followed closely by another," see also *Gallant* at paras. 131-32. The same argument was made in *Barber v. Wilson*, 1996 CarswellOnt 2618, 8 O.T.C. 350 at para. 4 (Ct. J. (Gen. Div.)) and the court rejected the argument based on the evidence. Dr. Pinder tendered scientific proof in this case. Thus, it is critical that this Court examine the evidence before it decides whether the temporal aspect is definitive.

d. Analysis

[269] For this Court to draw conclusions in relation to causation, it must consider two basic questions:

1. whether the epidemiological or biomechanical evidence indicates that SMT never causes strokes; and
2. on a balance of probabilities, whether SMT caused Ms. Dickson's stroke, taking into account:
 - (a) Ms. Dickson's medical history and known stroke risk factors,
 - (b) the timing of the SMT and her stroke, and
 - (c) the medical observations of Ms. Dickson's impairment and the affected area of her circulatory system.

i. epidemiological evidence

[270] Dr. Pinder argued that the epidemiological research that Dr. Cassidy conducted indicates there is no correlation between chiropractic treatment and strokes, so chiropractic treatment cannot cause strokes.

[271] When it considers the Cassidy Study and the other statistical information that the various experts provided to it, this Court must heed the caution that the Supreme Court of Canada sounded when it said in *Laferrière v. Lawson*, [1991] 1 S.C.R. 541, 78 D.L.R. (4th) 609 at 608 [citations omitted]:

... [A] judge will be influenced by expert scientific opinions which are expressed in terms of scientific probabilities or test samplings, but he or she is not bound by such evidence. Scientific findings are not identical to legal findings. ... [P]roof as to the causal link must be established on the balance of probabilities taking into account all the evidence which is before it, factual, statistical and that which the judge is entitled to presume.

...

The judge's duty is to assess the damage suffered by a particular patient, not to remain paralyzed by statistical abstraction.

Similarly, the court in *Anderson* at para. 24 said that the “danger in applying statistics to a case involving the causation of a medical condition such as a stroke is to overlook the proven facts of a particular case.” In other words, the facts drive the case, not the statistics. As well, we must remember always that “[t]he dynamics of the human body of each individual are themselves individual and there are lines of doubt and uncertainty at which a clear course of action may be precluded,” *Wilson v. Swanson*, [1956] S.C.R. 804, 5 D.L.R. (2d) 113 at para. 21.

[272] *Rothwell v. Raes* at para. 50 (H.C.J.) defined epidemiology as:

... [T]he study, control and prevention of diseases with respect to the population as a whole, or to defined groups thereof, as distinguished from disease in individuals. Clinical epidemiological studies can be carried out for the purpose of investigating the relationship between a particular condition existing in the environment, or population, and a particular disease or condition of health. A clinical epidemiological study cannot in itself prove causation but it may justify an inference that a statistical association reflects a causal link.

[273] The Cassidy Study is a very powerful epidemiological tool that studied the correlation between VBA strokes and whether chiropractors are more likely to cause VBA strokes than family physicians. As Woolfenden's First Report mentioned, there are limitations to the Cassidy Study, and those limitations are recognized in the study itself. As well, Dr. Woolfenden expressed his concern about using statistical analysis to come to a definitive conclusion concerning *a particular patient*. The *Rothwell* trial court at para. 52 expressed a similar concern, when it said, “no epidemiological study can conclusively prove a cause and effect hypothesis.”

[274] During argument, Dr. Pinder provided this Court with an interesting analogy taken from *Rothwell* trial decision at para. 67, which dealt with marbles in a bowl. The *Rathwell* court used that analogy in a different context, but for our purposes, if we assume that the bowl contains 10,000 marbles of which 5,000 are white and 5,000 are black. The chances of taking out a black or white marble is 100% and the chance of taking out either a white marble or a black marble is 50%. However, this Court raised a situation where there are two coloured marbles in the bowl. There is a chance that one could pull out the coloured marble. It is a mere possibility, but the possibility exists. In other words, Ms. Dickson might have had a stroke whether or not she went to see Dr. Pinder or a physician. We will never know. But the possibility remains that Dr. Pinder caused her stroke, through dissecting her vertebral artery. Based on the Cassidy Study, this is highly improbable. However, she could be the coloured marble or, in Dr. Upton's words, she could be the person who gets hit by a meteorite; an unlikely but *not impossible* result.

[275] Thus, this Court finds that the Cassidy Study, although important from an epidemiological perspective, is not helpful to this Court in resolving the issues before it. The epidemiological evidence clearly indicates that it is unlikely that Dr. Pinder's actions would have caused or contributed to Ms. Dickson's stroke. Nevertheless, Ms. Dickson did experience a stroke. The central question that remains is whether the SMT or some other and unrelated cause, caused Ms. Dickson's stroke.

ii. biomechanical analysis of the risk of SMT

[276] Dr. Symons' research on the biomechanical properties of the vertebral arteries and the forces exerted by SMT are of interest. However, Dr. Symons himself acknowledged the very significant limitations of his research. In many respects, his work could be characterized as a preliminary investigation of this issue.

[277] The Cadaver Study's relevance is much like that of Dr. Cassidy's epidemiological analysis. It asks the question "given the anatomical characteristics of the human neck, can an SMT procedure exert the kinds of force that would result in a vertebral artery dissection?" If the Cadaver Study showed there was never any chance that SMT could cause a vertebral dissection, then that would eliminate the possibility that Dr. Pinder injured Ms. Dickson's vertebral artery which led to her stroke. However, from the limitations outlined in the Cadaver Study itself, Dr. Woolfenden's comments, the academic controversy on the results of Cadaver Study and Dr. Symons' own comments, it is clear that the result of the Cadaver Study is not nearly so definitive. Rather, the Cadaver Study suggests that there is little possibility that SMT could cause vertebral artery dissection, but that leaves open the possibility that Ms. Dickson's injury was one of those rare, but not impossible, exceptions.

[278] Some of the biomechanical conclusions that the Cadaver Study reached, however, were confirmed by other experts, such as Dr. Rosso and Dr. Upton.

iii. risk factors

[279] Ms. Dickson's history and habits increased the likelihood that she could have had a stroke that was unrelated to the SMT. Dr. Upton listed many relevant risk factors that weaken the arteries. Even mild increases in these risk factors could have this effect. Dr. Upton testified that Ms. Dickson was obese to the point where she was "twice the weight she should be." This factor alone could increase the risk of diabetes or pre-diabetes, hypertension and cholesterol.

[280] As well, even if we assume that Ms. Dickson was a mild smoker and had used birth control pills or hormone replacement in the past, Dr. Upton testified that these would increase the risk of stroke because, "blood vessels do not suddenly return to normal as soon as you give up a bad habit." Dr. Woolfenden agreed that Ms. Dickson's risk of stroke was increased because she was a smoker. As well, he also noted her obesity and the fact that she was on estrogen for a time.

[281] Dr. Woolfenden opined that Ms. Dickson had modest risk factors for hardening of the arteries and atherosclerosis. Despite Dr. Woolfenden's testimony that Ms. Dickson's cholesterol was not above the normal range, Dr. Upton disagreed. He reviewed Ms. Dickson's cholesterol levels, which showed they were slightly above the norm. Dr. Woolfenden opined that Ms. Dickson did not meet the criteria for diabetes. Dr. Upton noted that Ms. Dickson's blood pressure readings were elevated and he reviewed her blood pressure levels from her medical charts which showed this. Dr. Woolfenden did not feel that Ms. Dickson had hypertension. Dr. Upton noted that Ms. Dickson had a history of migraine headaches, whereas Dr. Woolfenden did not see such a history. In conclusion, Dr. Upton stated that although none of Ms. Dickson's risk factors were severe, "when you have multiple risk factors, they become cumulative." Accordingly, he testified, that "the probable cause of the stroke ... was the multiple risk factors not the chiropractic manipulation." Cassidy's First Report at 9-10 also concluded that Ms. Dickson's stroke is likely related to her other risk factors and that she likely suffered a spontaneous vertebral artery dissection.

[282] This Court observes that while the experts disagreed on certain aspects of Ms. Dickson's risk criteria, there was no disagreement that she had significant biological and behavioural factors that could have contributed to her risk of suffering a stroke that was unrelated to the SMT. This is not a question of statistical correlation. Instead, Ms. Dickson had a stroke and she had risk factors that could result in a spontaneous occurrence of a stroke unrelated to the SMT. The existence of these specific risk factors, therefore, provides us with an alternative explanation.

[283] When commenting on these risks factors, this Court notes that Ms. Dickson was less than forthcoming in her activities that could have elevated the risk of her having a "spontaneous" stroke. Ms. Dickson has a history of using pharmaceuticals that have as a side-effect an increased risk of stroke. Dr. Payne was Ms. Dickson's family physician while she lived in Slave

Lake. When she was 30 years old, Ms. Dickson was bleeding, so Dr. Payne prescribed birth control pills to quell her bleeding. Dr. Payne required Ms. Dickson to take these pills three times a day for four days. Ms. Dickson testified that she took birth control pills “just ... for a little while.”

[284] As well, Ms. Dickson was having signs of early menopause, so her then doctor prescribed hormone pills. She initially testified that she did not take the hormone pills because she “knew hormone pills were bad” for her. She denied that she had learned, in preparing for this lawsuit, that hormone pills, or estrogen, are a risk factor for stroke. When questioned further, she admitted taking them for one or two days. However, her medical charts show that she took them for a longer period. This Court finds that Ms. Dickson knew this while she was providing her testimony to this Court. She tried to minimize her use of hormones.

[285] Further, this Court still has no idea of the number of cigarettes Ms. Dickson smoked or smokes. Her charts show various numbers and she admitted that she did not like discussing the number of cigarettes she smokes with her medical practitioners. The medical charts that her physicians prepared from information she provided, showed various amounts of smoking, from one package a day to 4 cigarettes every 2 to 3 days. This Court finds it difficult to accept her testimony that she only smoked one cigarette every couple of days.

[286] These factors are important from a general credibility perspective, but also with respect to the fact that these risk factors increase a person’s risk of suffering a stroke.

[287] Therefore, this Court concludes that Ms. Dickson had a substantial risk of experiencing a stroke that was unrelated to the SMT.

iv. timing of the SMT therapy and the stroke

[288] The SMT and Ms. Dickson’s stroke appeared to be close in time and one after the other. The experts commented on the significance of this temporal aspect.

[289] Upton’s First Report at para. F states that it was probable that Ms. Dickson’s “stroke occurred at some time after the chiropractic manipulation. There were no immediate symptoms of dissection or stroke after manipulation.”

[290] Dr. Woolfenden, on the other hand, concluded that the timing of Ms. Dickson’s stroke just shortly after the SMT was significant, though not in itself sufficient to prove causation. However, in Wolfenden’s Second Report at 5, he stressed that this close timing seemed more than coincidental, particularly when combined with the other characteristics of Ms. Dickson’s injury:

The clinical notes of Dr. Pinder and those of the Fort Saskatchewan Health Centre documented a change in Ms. Dickson's neck pain and headache several hours after the chiropractic treatment which, in my opinion, was not a "non-specific" change. Its relevance, in conjunction with the close proximity of the chiropractic manipulation to her stroke, the location of the stroke in the brain, and the catheter angiogram findings make it more probable than not that Ms. Dickson suffered a left medullary stroke secondary to the vertebral artery dissection as a result of the chiropractic treatment on February 14, 2002.

[291] Hu's First Report concludes that:

There appears to be a temporal relationship between stroke and the manipulation. However, with the information provided I am not absolutely sure whether the patient had manipulation higher up than C6-7 that would increase the suspicion that the manipulation caused the dissection.

Even if the manipulation did not cause the dissection, it is possible that the patient had a pre-existing dissection and then the chiropractic manipulation dislodged a thrombus to cause the stroke.

In either scenario, it would appear that there is a fairly strong temporal and anatomic relationship between the manipulation and the stroke.

[292] Upton's Second Report relies heavily on the Cassidy Report to find that Ms. Dickson's stroke might have been present when she attended on Dr. Pinder. Dr. Woolfenden did not dismiss the possibility that Ms. Dickson already had a dissection when she visited Dr. Pinder.

[293] We do not know precisely when Ms. Dickson's stroke occurred. Dr. Upton testified that Ms. Dickson might have had her stroke before she went to see Dr. Pinder, which is why she had neck pain and headaches. Others have testified that she might have had her stroke soon after she went to see Dr. Pinder. As noted above, this Court puts no weight on Dr. Hu's evidence when disputed. This Court concludes that the strongest characterization that it can make in relation to temporal correlation is that of Dr. Wolfenden; the timing of the stroke is significant, but not on its own enough to prove Dr. Pinder caused Ms. Dickson's stroke.

[294] We cannot establish the exact time of her stroke. *Gallant* at para. 132 said "the relevance of the temporal relationship between the procedure under review and the timing of the manifestation of symptoms by the patient" is significant when a court undertakes its weighing of the expert medical evidence. The correlation between the SMT and Ms. Dickson's stroke supports the possibility that Dr. Pinder caused Ms. Dickson's stroke. However, this aspect is only one factor this Court must consider.

v. features of Ms. Dickson's injury and circulatory system

[295] There is no disagreement among the experts on one key point; Ms. Dickson's stroke was consistent with some kind of disruption of her VBA system, and the consequential interruption in blood flow to a part of Ms. Dickson's brain. What remains unresolved is whether that disruption was caused by an injury to her vertebral artery, whether it was idiopathic or whether it was caused by an unrelated factor.

[296] The experts identified two possible and relevant sites of injury on Ms. Dickson's left vertebral artery:

1. an abnormality inside the skull in the V4 region; and
2. a flap-like abnormality located near the boundary of the V1 and V2 courses.

[297] The key to evaluating these sites is correlating clinical symptoms and medical observations. Dr. Woolfenden cautioned this Court that:

The diagnosis of a cervical artery dissection requires a correlation between clinical symptomatology and imaging results. Reliance on just the clinical information or just the imaging is inferior to looking at the entire clinical-radiologic picture.

Woolfenden's First Report at 11

[298] This Court will examine each of these two abnormalities separately.

A. *the intracranial V4 abnormality*

[299] The experts described this abnormality as a congenital narrowing of the left vertebral artery, or as a dissection in the artery at that location. This Court concludes that it is the former.

[300] This Court does not accept Dr. Hu's conclusion, and Dr. Buchan did not explain a mechanism for an injury in this location. Dr. Woolfenden thought the visible characteristics of the abnormality were consistent with an arterial dissection.

[301] In contrast, Dr. Rosso provided an explanation of how if that feature was a dissection then treatment of Ms. Dickson's stroke should have resulted in detectable changes in the shape and form of the alleged dissection. No one detected those changes. Instead, Dr. Rosso testified that the abnormality behaved in a manner consistent with a congenital narrowing in the left vertebral artery.

[302] This Court did not find that Dr. Pinder used excessive force when applying SMT or that he over-rotated Ms. Dickson's head. This Court accepts Dr. Rosso's testimony that the SMT likely did not cause the irregularity or a dissection of her vertebral artery, intracranially. The evidence of Drs. Upton and Rosso is that the physiological structure in that region discounts the possibility of force applied lower in the neck affecting the intracranial portion of the vertebral arteries. These experts also noted that while dissections were known to occur in this region, these dissections were usually "spontaneous," and not associated with physical trauma.

[303] Based on the foregoing this Court concludes that Ms. Dickson did not have an intracranial arterial dissection in her left vertebral artery at this location. Even if she had a dissection in this location, there was a greater likelihood that the dissection occurred spontaneously, rather than as a consequence of the SMT.

B. the 'flap' abnormality in the V1 / V2 region

[304] The experts disagreed on whether the alleged lower abnormality was a dissection. Drs. Upton and Buchan concluded the feature was probably an actual injury, but attributed that injury to the catheter that Dr. Ashforth used during the angiography, an injury that occurred after Ms. Dickson's stroke. Dr. Wolfenden disagreed, and concluded this feature was a dissection.

[305] This Court accepts Dr. Rosso's opinion that the alleged dissection at the V1 / V2 course was not a dissection at all. It was a double density that shows a superimposition of the artery. The decisive factor in this Court putting a greater weight on Dr. Rosso's observation is that the alleged dissection is only visible in certain planes. As well, this Court accepts his explanation of the significance of that fact; the abnormality is better characterized as an artifact of the manner in which the vessel was viewed, rather than an actual injury.

C. conclusion - observations of Ms. Dickson's left vertebral artery

[306] This Court concludes that Ms. Dickson's left vertebral artery was not dissected. Since the explanations of how the SMT could have caused her stroke involve a dissection of that artery, this Court concludes that the SMT did not cause Ms. Dickson's stroke.

d. Causation - Conclusion

[307] Why did Ms. Dickson have a stroke on February 15, 2002? What caused Ms. Dickson's stroke and was the SMT a contributing factor? This Court accepts Dr. Upton's analysis of the cause of Ms. Dickson's stroke. She might not have had any one serious risk factor, although this Court could easily find that her smoking and obesity were those factors. However, when one analyzes all her various risk factors, this Court accepts Dr. Upton's testimony that in combination, they were more likely than not to have caused her stroke.

[308] As to the physiological indicators, Dr. Rosso provided this Court with the most frank answer when he responded to this Court's question:

Q ... How did Ms. Dickson have her stroke if we saw essentially no irregularities in her vertebral artery?

A I don't know.

[309] This is not a case where this Court is required to apply the material contribution test. There is no impossibility of establishing causation using the but-for test. This Court need not be scientifically precise. But-for Ms. Dickson's multiple risk factors, she would not have had her stroke. Her multiple risk factors were the cause of her stroke. The kind of arterial injury that was required for a SMT-associated injury is absent. She has not met her burden of proving that the SMT was the cause or a cause of her stroke. As a result, her claim against Dr. Pinder is dismissed.

[310] Because of this finding, this Court need not explore the question of whether the chiropractic profession should be performing SMT at all. An answer to that question is better left for another day.

7. Costs

[311] Dr. Pinder is entitled to his taxable Schedule C costs of this action. If the parties are unable to agree on the quantum of those costs within 60 days of the date of this judgment, they may come before this Court to have them settled.

Heard on the 16th day of November, 2009 through the 11th day of December, 2009.

Dated at the City of Edmonton, Alberta this 19th day of April, 2010.

K.D. Yamauchi
J.C.Q.B.A.

Appearances:

David deVere and Mark Smith
Weir Bowen LLP
for the Plaintiff

Karin Buss and Richard C. Secord
Ackroyd LLP
for Ross J. Pinder