

[Moore v. Getahun, \[2014\] O.J. No. 135](#)

Ontario Judgments

Ontario Superior Court of Justice

J.M. Wilson J.

Heard: October 15-17, 21-25 and December 23, 2013.

Judgment: January 14, 2014.

Court File No. 06-CV-321339PD3

[2014] O.J. No. 135 | 2014 ONSC 237

Between Blake Moore, Plaintiff, and Dr. Tajedin Getahun, The Scarborough Hospital-General Division, Dr. John Doe, Jack Doe, Defendants

(534 paras.)

Case Summary

Health law — Health care professionals — Liability (malpractice) — Negligence — Causation — Error in judgment — Standard of care — Particular professions — Doctors — Surgeons — Action by plaintiff against physician to determine liability for personal injuries allowed — Plaintiff went over handlebars of motorcycle and struck parked vehicle, fracturing wrist — Defendant physician fitted plaintiff with full circumferential cast — Following day, plaintiff attended emergency due to pain and swelling and underwent emergency surgery for compartment syndrome — Physician who fitted cast failed to meet standard of care, as he should have applied splint or bi-valve cast cut to skin — Circumferential cast caused development of compartment syndrome, as it could not accommodate anticipated swelling from high impact injury — Ontario Rules of Civil Procedure, Rule 53.03.

Professional responsibility — Self-governing professions — Duties — Duty of care — Standard of care — Negligence — Liability — Causation — Professions — Health care — Doctors — Surgeons — Action by plaintiff against physician to determine liability for personal injuries allowed — Plaintiff went over handlebars of motorcycle and struck parked vehicle, fracturing wrist — Defendant physician fitted plaintiff with full circumferential cast — Following day, plaintiff attended emergency due to pain and swelling and underwent emergency surgery for compartment syndrome — Physician who fitted cast failed to meet standard of care, as he should have applied splint or bi-valve cast cut to skin — Circumferential cast caused development of compartment syndrome, as it could not accommodate anticipated swelling from high impact injury — Ontario Rules of Civil Procedure, Rule 53.03.

Tort law — Negligence — Duty and standard of care — Standard of care — Causation — Action by plaintiff against physician to determine liability for personal injuries allowed — Plaintiff went over handlebars of motorcycle and struck parked vehicle, fracturing wrist — Defendant physician fitted plaintiff with full circumferential cast — Following day, plaintiff attended emergency due to pain and swelling and underwent emergency surgery for compartment syndrome — Physician who fitted cast failed to meet standard of care, as he should have applied splint or bi-valve cast cut to skin — Circumferential cast caused development of compartment syndrome, as it could not accommodate anticipated swelling from high impact injury — Ontario Rules of Civil Procedure, Rule 53.03.

Action by the plaintiff, Moore, against the defendants, Dr. Getahun, Scarborough Hospital, and two unnamed doctors, to determine liability for personal injuries. In 2005, the plaintiff was injured when he lost control of his motorcycle and went over the handlebars, striking a parked vehicle. The plaintiff suffered a high impact fracture to his wrist and other minor injuries. He was taken to the emergency department of the defendant hospital, where the defendant physician applied a full circumferential cast after a partially successful closed reduction. The following day, the plaintiff went to emergency complaining that his cast was too tight and was causing pain and swelling. The attending physician suspected compartment syndrome and removed the cast. An orthopedic surgeon confirmed the diagnoses and performed emergency surgery. The plaintiff suffered permanent injuries to his right arm as a result of the compartment syndrome and the aftermath. The parties agreed on the quantification of damages. At issue was the defendant physician's liability in applying a full circumferential cast to the plaintiff's injury.

HELD: Action allowed.

In applying a circumferential cast, the defendant did not meet the standard of care of a reasonably prudent general orthopedic surgeon in 2005 in a community hospital in Ontario. To meet the standard of care, the defendant should have applied either a splint or a bi-valve cast cut to the skin. Before discharging the plaintiff, the defendant failed to adequately educate or warn the plaintiff of the risk of developing compartment syndrome, and he treated his injury as routine. The failure to warn did not, however, impact the issue of causation, as the plaintiff attended hospital the following day. The expert evidence adduced on behalf of the plaintiff established that the application of the closed circumferential cast caused the development of compartment system, as the anticipated swelling from a high impact injury could not be accommodated by that type of cast.

Statutes, Regulations and Rules Cited:

Evidence Act, [R.S.O. 1990, c. E.23, s. 52](#)

Ontario Rules of Civil Procedure, Rule 20.05(2)(i), Rule 50.07(1)(c), Rule 53.03, Rule 53.03(2.1), Rule 53.03(3)

Counsel

J.M. Regan, A.G. Sciacca, for the Plaintiff.

C.B. Kuehl, J.L. Hunter, for the Defendant, Dr. Tajedin Getahun.

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J.M. WILSON J.

Overview

1 On November 12, 2005, the plaintiff Blake Moore's motorcycle careened out of control. The plaintiff flew over the handlebars. The plaintiff and the motorcycle hit a parked hummer vehicle causing it to move two feet. The plaintiff suffered a high impact fracture to his right wrist and other minor injuries. He was taken to the emergency department at Scarborough General Hospital - General Division.

2 The defendant, Dr. Tajedin Getahun, applied a full circumferential cast after a partially successful closed reduction.

3 On Sunday November 13, 2005, the plaintiff went to North York General Hospital emergency department, complaining of increased pain, swelling, and that the cast was too tight. After some initial delay, he was seen by an emergency room physician, who immediately suspected compartment syndrome. He removed the cast and referred the plaintiff to an orthopedic surgeon, who confirmed the diagnosis and performed emergency surgery for the compartment syndrome that had developed.

4 The plaintiff has lasting permanent injuries to his right arm as a result of the compartment syndrome and its aftermath. The parties have agreed upon damages. The issue before me in this trial is the defendant's liability in applying a full circumferential cast to the plaintiff's injury.

5 In the context of this medical malpractice suit, several evidentiary issues arose concerning the admissibility of expert evidence under Rule 53.03 of the *Rules of Civil Procedure, R.R.O. 1990, Reg. 194*. Can the report of an expert treating doctor who has died be admitted into evidence for its truth? What are the limits of the admissibility of evidence of treating emergency room physicians? Can they express opinion evidence? Is it appropriate under Rule 53.03 for counsel to review draft reports of experts and provide input to shape expert reports? Can the facts of the case as disclosed in the evidence be put to the expert witness to test opinions? Can issues relating to liability be canvassed with an expert witness in his or her evidence if not explicitly contained in the expert report?

The Issues

6 There are two primary issues to determine liability:

- * Whether the defendant met the standard of care of a general orthopedic surgeon in 2005 in a community hospital in Ontario, or whether he was negligent in the advice and treatment he gave and in applying a closed circumferential cast to the plaintiff's wrist in the circumstances of this case.
- * Whether the plaintiff has met the onus of proof on a balance of probabilities that the closed circumferential cast caused the compartment syndrome to develop.

7 On these two issues the plaintiff's expert first testified that applying the full circumferential cast in the circumstances of this case fell below the acceptable standard of care. Second, he opined that applying the full circumferential cast to the plaintiff's underlying injury on a balance of probabilities caused the development of the compartment syndrome.

8 The defendant's two experts testified that the application of a full circumferential cast in this case met the standard of care in the community. Further, they testified that the cause of the development of the compartment syndrome was the underlying injury. The application of a full circumferential cast to the plaintiff's high impact injury could aggravate, or exacerbate, the development of compartment syndrome, but the cause of the condition was the plaintiff's underlying injury.

Description of Compartment Syndrome

9 The defendant filed a glossary of medical terms. Compartment syndrome is defined as "a painful condition resulting from the expansion of enclosed tissue within its anatomical enclosure, producing pressure that interferes with circulation and adversely affects the function and health of the tissue itself."

10 Dr. Richards described compartment syndrome as follows:

The skeletal muscle in the limbs of the human body is contained within fascial compartments. If the pressure in the fascial compartment increases to the extent that the muscle no longer receives a blood supply, the muscle begins to die. The process is called compartment syndrome.

11 Dr. Taylor described the process of developing compartment syndrome and how it becomes irreversible at some point during its development:

Because the initial injury, whatever the injury happens to be, bleeding or swelling or injuries to the tissues within the compartment, the muscles, that's what begins to impede the circulation of blood through the compartment and that becomes a sort of self-perpetuating process, because as the ... circulation is impeded, the pressure goes up and the veins - or, the capillaries especially dilate, fluid leaks out of the capillaries into the interstitial space which further causes swelling. Because there's more swelling, there's more impediment of the blood flow, so more fluid now leaks out of the capillaries and that's how the vicious cycle ... the muscles and tissues become anoxic, they break down ... and it becomes self-perpetuating. And the only way of stopping a true compartment syndrome is to alleviate that pressure that's built up that's causing the abnormal circulation, and that means doing a fasciotomy.

12 The evidence before me confirms that, once the process of developing compartment syndrome begins, at some point in time the process becomes irreversible. The only treatment to relieve the pressure in the compartment is a fasciotomy, which is cutting the fascia surrounding the compartment to relieve the compartment pressure to avoid muscle necrosis and potential muscle death. All of the experts confirm that time is of the essence once compartment syndrome is diagnosed.

Preliminary Motion as to the Admissibility of Dr. Orsini's Medical Reports

13 Dr. Emil Orsini performed the emergency surgery to treat the plaintiff's compartment syndrome at North York General on Sunday evening on November 13, 2005.

14 The plaintiff subsequently retained Dr. Orsini to provide his expert opinion on the issues of negligence and causation. Dr. Orsini prepared an expert report dated July 27, 2006 with an addendum outlining his factual findings, observations, and the procedures followed. He was of the opinion that the defendant failed to meet the requisite standard of care in applying a closed circumferential cast for the plaintiff's high impact injury. Significant swelling was to be anticipated and could not be accommodated in a full circumferential cast. Dr. Orsini also gave the opinion that the application of a closed circumferential cast caused the development of the compartment syndrome.

15 Unfortunately, Dr. Orsini passed away prior to this trial. The plaintiff then retained Dr. Robin Richards to review the file and to provide opinions on standard of care and causation. He agreed with Dr. Orsini's opinions.

16 The plaintiff brought a motion at the opening of this trial seeking to admit Dr. Orsini's reports into evidence. The plaintiff made two alternative arguments on this motion. First, Dr. Orsini's reports were admissible under s. 52 of the *Evidence Act*, R.S.O. 1990, c. E.23. Second, the plaintiff argued that the reports were admissible under the principled approach to the hearsay rule. Necessity was met as Dr. Orsini is deceased. Reliability was met because Dr. Orsini examined the plaintiff at the material time, he prepared the reports in a professional capacity, and the defendant could test the reliability of his opinions through cross-examination of a different expert familiar with them.

17 The defence sought to exclude Dr. Orsini's reports which outline the facts and his observations, as well as his opinion as to standard of care and causation. First, the defendant argued that Dr. Orsini's reports were not admissible under s. 52 of the *Evidence Act*. Dr. Orsini's reports were "medical legal" reports because their primary purpose was to provide a legal opinion on negligence and causation. Second, the defendant argued that Dr. Orsini's opinion in his reports was not necessary because Dr. Richards could provide expert opinion evidence on negligence and causation. The defendant challenged the reliability of Dr. Orsini's report as the defence could not cross-examine Dr. Orsini, he was biased because he was the plaintiff's treating doctor, and his reports did not comply with Rule 53.03(2.1) of the *Rules of Civil Procedure*. His reports were written prior to the amendments to Rule 53.03.

18 Dr. Orsini's first report outlined facts that amplified the hospital notes and records as he was the treating surgeon who performed the surgery and he observed the plaintiff at the time these events unfolded. The two reports also contain opinion. I distinguished Dr. Orsini's account of the facts from his opinions in his reports.

19 I ruled at the commencement of the trial that the content of Dr. Orsini's first report outlining the facts and his observations were admissible for their truth. These statements supplement the hospital records admitted into evidence, and appear admissible pursuant to s. 52 of the *Evidence Act*. The defence did not object to this ruling, and during the trial relied on some of the supplemental facts contained in Dr. Orsini's first medical report.

20 I ruled that Dr. Orsini's opinions on standard of care and causation expressed in his reports were not admissible for their truth as the requirement of necessity had not been met. Dr. Orsini was not available for cross-examination and the plaintiff had another qualified expert, Dr. Richards, available to testify on the issues of standard of care and causation. I conclude that there is no evidence of bias of Dr. Orsini.

21 The various expert reports comment on Dr. Orsini's opinion, as well as his surgical notes and observations. I concluded that Dr. Orsini's opinions on negligence and causation expressed in his reports are admissible as part of the *res gestae* and background, but not admitted for their truth.

22 Another issue arose with respect to the contents of conversations between Dr. Orsini, the plaintiff, and/or the plaintiff's father prior to and immediately following the surgery on November 13, 2005, long before Dr. Orsini was retained as an expert witness. During these conversations, Dr. Orsini clearly and unequivocally expressed his views as to the defendant's negligence and the issue of causation.

23 I conclude that aspects of these conversations containing opinions about negligence or causation are also admissible as part of the *res gestae* but are not admissible for their truth. The conversations about whether a bone graft was required are admissible for their truth as part of the facts and Dr. Orsini's observations, unrelated to opinions on liability.

24 After I outlined my conclusions on the preliminary motion excluding Dr. Orsini's opinion, the plaintiff proposed to call another expert witness who had filed an expert medical report, Dr. William Regan, from Vancouver. Dr. Regan is the brother of plaintiff's counsel. I concluded that his evidence would not help me assess negligence and causation as Dr. Regan was in a position of a potential conflict of interest. Counsel for the plaintiff did not press the issue.

25 In light of my rulings, the defence cannot argue that, as they have two expert witnesses confirming their point of view and the plaintiff only has one witness, the defence position is therefore stronger or should be accepted.

26 In summary, in assessing the issues of standard of care and causation, I will consider the evidence of the witnesses that testified at this trial who were available for cross-examination. I will also consider as evidence admitted for its truth the aspects of Dr. Orsini's reports that include the facts and his observations.

Other Evidentiary Issues that arose during Trial

Appropriate scope of the evidence of the emergency room physician

27 Dr. Russell Tanzer was the emergency room physician at North York General that initially saw the plaintiff on November 13, 2005 at approximately 1:15 p.m. The plaintiff called Dr. Tanzer as a fact witness. Based upon his observations of the tight cast, and after reviewing the X-rays, Dr. Tanzer ordered that the plaintiff's cast be removed at about 1:44 p.m., with the exception of a supportive slab and the soft roll. He had made the preliminary diagnosis of compartment syndrome and immediately contacted Dr. Orsini to advise him of his diagnosis. Dr. Orsini was the orthopedic surgeon on call for the emergency department.

28 Dr. Tanzer expressed the opinion that the cause of the plaintiff's compartment syndrome was the full circumferential cast that was too tight. He gave evidence of the practice and teaching for emergency room physicians that casts are contraindicated in a high energy injury such as the plaintiff's.

29 He did not file a medical report. The defence challenges all of Dr. Tanzer's evidence including his evidence about practices taught to emergency room physicians in the case of a high impact acute radius fracture and his opinion about causation.

30 There has been considerable commentary over the amended Rule 53.03 and the appropriate scope of treating physician evidence as distinct from expert evidence and general fact evidence.

31 In *Burgess v. Wu* (2003), 68 O.R. (3d) 710, at paras. 80-81, Ferguson J. distinguished between treatment opinions and litigation opinions. Treating physicians provide treatment opinions, which include the diagnosis, treatment plan, and prognosis made at the time of treatment. Experts provide litigation opinions; they "usually involve a consideration of much more information from various sources and are formed for the purpose of assisting the court at trial": at para. 80.

32 In *Beasley v. Barrand*, 2010 ONSC 2095, 101 O.R. (3d) 452 (S.C.), the plaintiff claimed damages for injuries when his motorcycle collided with the defendant's car. The "experts" at issue were three Accident Benefits Assessors retained by an insurer and not by either party. Their reports were not Rule 53.03 compliant. Moore J. ruled that the witnesses must comply with the amended Rule 53.03 or their opinion evidence was inadmissible.

33 In contrast, in *McNeil v. Filthaut*, 2011 ONSC 2165, [2011] O.J. No. 1863, MacLeod-Beliveau J. found that Rule

53.03 must be read in conjunction with Rule 4.1.01. She concluded that both Rule 4.1.01 and Rule 53.03 apply only to experts engaged by or on behalf of a party. Since treating physicians are not engaged on behalf of a party, they are not subject to Rule 53.03 requirements.

34 In *Westerhof v. Gee Estate*, [2013 ONSC 2093](#), [\[2013\] O.J. No. 3134](#), the Divisional Court expressly adopted *Beasley* and rejected *Filthaut*. The important distinction is not the witness' role or involvement, but the type of evidence to be admitted. If a party seeks to admit "opinion evidence, compliance with rule 53.03 is required; if it is factual, it is not": *Westerhof*, at para. 21.

35 The Divisional Court clarified at para. 24 that a treating physician's diagnosis may be fact, not opinion, if the purpose of the evidence is to explain the treatment provided. In that context, the diagnosis is a fact and the catalyst for the treatment.

36 In the aftermath of *Westerhof*, there is uncertainty about the appropriate scope of treating physician testimony. This uncertainty requires clarification from a higher court.

37 In her paper "Rule 53 and Treating Practitioners," D. Wilson J. states that there are two key questions in light of the clear disagreement between *Beasley* and *Filthaut*.¹ First, is the application of Rule 53.03 based on the nature of the individual and their relationship to the litigation, or rather the nature of the evidence? *Westerhof* suggests that compliance with Rule 53.03 is required by the nature of the evidence and all opinion evidence, including treating physicians' opinions, must comply with the rule. Second, does the legal distinction remain in Ontario between "treatment opinion" and "litigation opinion," and if it does, is it simply that "treatment opinion" must be fact evidence and "litigation opinion" is opinion evidence? D. Wilson J. confirms that the present caselaw does not provide clear answers to these questions.

38 Asher Honickman and M. Greg Abogado write in the *Advocates' Society Journal* that *Westerhof* "is currently binding authority in Ontario" but it is "unlikely to be the final word on the matter."² They suggest that "the Divisional Court in *Westerhof* took some important strides to restrict the use of opinion evidence, but it went too far in doing so." Treating physicians should be able to offer opinions for the truth of their contents when the opinions are based on the physicians' own observations and rely on the physicians' basic expertise.

39 Dr. Tanzer did not include any details in his notes as the consulting emergency room physician. His notes did not meet the expected standard of care for note-keeping. The defence challenges the reliability of Dr. Tanzer's evidence in its entirety due to the inadequate notes, and alleges that he was biased in favour of the plaintiff.

40 I accept that Dr. Tanzer had a clear, actual memory of the plaintiff's case. He communicated his observations and concerns immediately to Dr. Orsini, who examined the plaintiff and performed the emergency surgery.

41 Dr. Orsini in his inpatient operative report dictated on November 16, 2005 confirms the role played by Dr. Tanzer, as well as his own observations:

The following day he had increasing pain and came to North York General Hospital and his cast was split by Dr. Russel Tanzer in the Emergency Department. He had really no significant relief of his pain. At this point he had significant pain, numbness and weakness of his entire right hand. He did have hand weakness and numbness following his injury but it had worsened with the tight cast.

42 I conclude that Dr. Tanzer, as the treating emergency room physician, must be able to give evidence in a fulsome, comprehensive manner about his recollection of the steps he took on November 13, 2005, including his observations, diagnosis at the time, the reasons for his diagnosis, and the steps that he took as a consequence of his observations and diagnosis. This fact evidence is inevitably somewhat blurred with the issue of causation, but is necessary evidence to understand what Dr. Tanzer saw and what he did on November 13, 2005. This approach conforms to the principles in *Westerhof*.

43 I conclude that Dr. Tanzer's observations of the tight cast and the reasons why he cut off the cast are admissible facts for their truth. His diagnosis of compartment syndrome is also admissible for its truth and explains his actions, both cutting off the cast and calling Dr. Orsini to advise of his diagnosis of compartment syndrome and the need for immediate attention.

44 Dr. Orsini's summary of the facts and diagnosis prepared in the usual course and dictated three days after the surgery confirm the facts included in Dr. Tanzer's testimony as well as Dr. Orsini's observations. Both were relied upon by Dr. Richards in forming his opinion on causation.

45 As Dr. Tanzer did not serve a report pursuant to Rule 53.03 of the *Rules of Civil Procedure*, I conclude that he cannot provide opinions on the ultimate issue of causation or standard of care. Therefore, Dr. Tanzer's opinion evidence that the development of compartment syndrome was caused by the tight cast is not admissible.

46 Dr. Tanzer gave further evidence that the taught and established practice for emergency room physicians dealing with high impact fractures of the distal radius is to splint these injuries and never use a full circumferential cast. This evidence is not admissible to establish the standard of care in this case, as he did not file a report in compliance with Rule 53.03. In any event, the standard of practice for emergency room physicians may not be relevant to establishing the standard of care for orthopedic surgeons.

Whether it is appropriate for counsel to review experts' draft reports

47 The defence called Dr. Ronald Taylor to testify as an expert. He filed a first report dated February 10, 2009 and a second report dated September 9, 2013. During his evidence, plaintiff's counsel reviewed Dr. Taylor's file and found notes about a one-and-a-half-hour telephone call that took place on September 6, 2013 between defence counsel and Dr. Taylor. During that phone conversation, defence counsel reviewed Dr. Taylor's draft report dated August 27, 2013 and suggested changes for the final report. Dr. Taylor confirmed that he had sent his draft report "to Lerner for comments." Dr. Taylor said he was happy with his draft report but Lerner made "suggestions" and he made "the corrections over the phone."

48 The plaintiff submits that this phone meeting was improper. It was inappropriate for defence counsel to make suggestions to shape Dr. Taylor's report.

49 Defence counsel's written and oral submissions at the conclusion of the trial suggest that "experts are entitled to prepare draft reports and they are entitled to share those drafts with counsel for comment and discussion."

50 For reasons that I will more fully outline, the purpose of Rule 53.03 is to ensure the expert witness' independence and integrity. The expert's primary duty is to assist the court. In light of this change in the role of the expert witness, I conclude that counsel's prior practice of reviewing draft reports should stop. Discussions or meetings between counsel and an expert to review and shape a draft expert report are no longer acceptable.

51 If after submitting the final expert report, counsel believes that there is need for clarification or amplification, any input whatsoever from counsel should be in writing and should be disclosed to opposing counsel.

52 I do not accept the suggestion in the 2002 Nova Scotia decision, *Flinn v. McFarland*, [2002 NSSC 272](#), [211 N.S.R. \(2d\) 201](#), that discussions with counsel of a draft report go to merely weight. The practice of discussing draft reports with counsel is improper and undermines both the purpose of Rule 53.03 as well as the expert's credibility and neutrality.

Whether expert witnesses should be limited in their evidence to the contents of their reports, or whether they can be questioned as to the facts in the case to test their opinions

53 After completion of the plaintiff's case, but before any of the expert witnesses testified, there was a one-day

scheduling delay in the trial. I suggested that the expert witnesses meet or telephone conference to discuss amongst themselves the issues based upon the facts that had emerged during the trial to assess their opinions on liability. The experts could canvass any factual disputes underlying their opinions to try to narrow and clarify issues. Counsel, particularly defence counsel, were reluctant to proceed in this manner.

54 It appears that there is clear authority for such an approach in a variety of interacting rules contained in the *Rules of Civil Procedure*, and in Osborne J.'s report *Civil Justice Reform Project: Summary of Findings & Recommendations* (Ottawa: Queen's Printer for Ontario, 2007).

55 The 2010 amendments to the *Rules of Civil Procedure* introduced the court's power to order opposing experts to meet and confer in order to clarify different interpretations and narrow issues. Osborne J.'s report, *Civil Justice Reform Project: Summary of Findings & Recommendations*, provides the rationale for this amended power at 76-77:

Expert bias can, I think, best be reduced or somewhat controlled by a "meet and confer" requirement. In its Supplemental Report, the Discovery Task Force proposed this as a best practice where there are contradictory expert reports. The authority to require experts to meet and confer exists in other jurisdictions, including England and Wales, and in Australia under certain circumstances. In Alberta and New Brunswick the court may order experts to meet at the pre-trial stage. British Columbia's Civil Justice Working Group recommended that a case planning conference judge have the authority to order opposing experts to meet to identify areas of agreement or disagreement and narrow the issues.

56 As a result of these recommendations, Rules 20.05(2)(k) and 50.07(1)(c) were introduced to the *Rules of Civil Procedure*. Rule 20.05(2)(k) provides that, if a summary judgment is refused or granted only in part, the court may order the experts to meet to attempt to clarify and resolve issues:

[T]hat any experts engaged by or on behalf of the parties in relation to the action meet on a without prejudice basis in order to identify the issues on which the experts agree and the issues on which they do not agree, to attempt to clarify and resolve any issues that are the subject of disagreement and to prepare a joint statement setting out the areas of agreement and any areas of disagreement and the reasons for it if, in the opinion of the court, the cost or time savings or other benefits that may be achieved from the meeting are proportionate to the amounts at stake or the importance of the issues involved in the case and,

- (i) there is a reasonable prospect for agreement on some or all of the issues, or
- (ii) the rationale for opposing expert opinions is unknown and clarification on areas of disagreement would assist the parties or the court.

57 Rule 50.07(1)(c) provides that, if the proceeding is not settled at the pre-trial conference, the presiding judge or case management master may "make such order as the judge or case management master considers necessary or advisable with respect to the conduct of the proceeding, including any order under subrule 20.05 (1) or (2)," which is the rule authorizing a court order requiring experts to meet to clarify and narrow issues.

58 Counsel did not wish to pursue my "meet and confer" suggestion, which may not have been realistic given time constraints. This approach is more of a trial management issue. Clearly in this case the parties would have benefited had such a meeting taken place.

59 In the alternative, I suggested to counsel that, if the experts did not meet or discuss matters amongst themselves, after the plaintiff's fact witnesses had testified, it would be helpful to put to each of the expert witnesses an agreed statement of fact or a statement containing factual differences prepared by both counsel to assess the expert opinion expressed in the medical reports in light of the evidence called at trial. The purpose of putting to each expert the facts as disclosed in the trial would be to ascertain whether the facts disclosed in the evidence in any way changed the expert's previous opinions on standard of care and causation as expressed in the reports.

60 Defence counsel strongly objected to this approach and asserted that the defendant was entitled to know the case he had to meet before testifying. If the experts, particularly Dr. Richards, were asked about issues or facts not specifically contained in their reports related to liability, defence counsel required an amended report from the plaintiff's expert and a trial adjournment to obtain further defence expert reports. The plaintiff did not want an adjournment. Therefore, based upon defence counsel's objections, the plaintiff's counsel agreed that Dr. Richards would limit his testimony in chief to the four corners of his reports.

61 Is this approach limiting the expert evidence what is contemplated by Rule 53.03 of the *Rules of Civil Procedure*?

62 Rule 53.03(3) provides as follows:

An expert witness may not testify with respect to an issue, except with leave of the trial judge, unless the substance of his or her testimony with respect to that issue is set out in,

- (a) a report served under this rule; or
- (b) a supplementary report served on every other party to the action not less than 30 days before the commencement of the trial. [Emphasis added.]

63 Prior to the amendments to Rule 53.03, the Court of Appeal interpreted the phrase "the substance" of his or her testimony under the old Rule 53.03 in a fulsome, pragmatic manner. In *Thorogood v. Bowden* (1978), 21 O.R. (2d) 385 (C.A.), a personal injury action, the expert's report indicated that the injuries would manifest in more intensive symptoms later in life. At trial, the expert testified about the possibility of arthritis and the future need for an artificial hip. The defendant argued on appeal that the expert raised matters outside the substance of his report. The Court of Appeal dismissed the appeal and stated the following at p. 386:

We interpret the law with respect to medical reports to be that a medical expert is not to be narrowly confined and limited to the precise contents of his report, but he has a right to explain and amplify. What was done here ... was to expand on what was latent in the medical report, and it did not open a new field. [Emphasis added.]

64 *Thorogood* was applied in *Auto Workers' Village (St. Catherines) Ltd. v. Blaney, McMurtry, Stapells, Friedman*, [1997] O.J. No. 2865 (Ct. J. Gen. Div.). The plaintiff argued that the solicitors were negligent and caused the plaintiff damages in connection with a condominium project. Quinn J. ruled that the expert on condominium development could not testify about whether a particular clause was void, as the opinion was not stated in his report. The opinion entered a new field that was not latent in the expert's report.

65 The Court of Appeal again considered the meaning of "substance" under Rule 53.03 in *Marchand (Litigation guardian of) v. Public General Hospital Society of Chatham* (2000), 51 O.R. (3d) 97. The Court of Appeal referred to *Thorogood* and *Auto Workers' Village* at para. 36 and stated the following at para. 38:

[W]hile testifying, an expert may explain and amplify what is in his or her report but only on matters that are "latent in" or "touched on" by the report. An expert may not testify about matters that open up a new field not mentioned in the report. The trial judge must be afforded a certain amount of discretion in applying rule 53.03 with a view to ensuring that a party is not unfairly taken by surprise by expert evidence on a point that would not have been anticipated from a reading of an expert's report. [Emphasis added.]

66 After the amendments to Rule 53.03, *Auto Workers' Village* and *Marchand* were applied in *Klitzoglou v. Cure Estate*, 2012 ONSC 3411, 2012 CarswellOnt 7377, at paras. 7-8; see also *Lee (Litigation guardian of) v. Toronto District School Board*, 2012 ONSC 3266, [2012] O.J. No. 2480, at para. 28; *Elbakhiet v. Palmer*, 2012 ONSC 2529, [2012] O.J. No. 4470, at para. 106; and *Hoang (Litigation guardian of) v. Vicentini*, 2012 ONSC 1358, [2012] O.J. No. 889, at para. 8.

67 Inevitably, a report is a summary, and cannot be a complete rendition of all of the evidence. In this case, plaintiff's counsel capitulated to the defence arguments to avoid a possible adjournment. As a result, Dr. Richards' testimony was strictly limited, at least in chief, to the four corners of his report.

68 Interestingly enough, defence counsel did not follow the same rules when it came to questioning their own experts. Notwithstanding their position limiting the scope of Dr. Richards' evidence, I allowed defence counsel to explore facts and issues not directly contained in the defence expert reports that were latent in their reports, with a possible right of reply evidence by Dr. Richards.

69 In my view, the meaning of "substance of the report," "latent in a report," or "touched upon" must be interpreted in a robust, practical fashion to ensure the trier of fact has the full benefit of the expert's opinion, without raising completely unrelated, new issues that would take the opposing party by surprise. Certainly the facts as they evolve in a trial both agreed to or in dispute should be presented to the expert witnesses, whether or not they were specifically referred to by the expert in his or her report. If the factual underpinnings of the expert opinion are not born out in the evidence, the validity of the expert opinion is weakened or nullified.

70 I disagree with defence counsel's submissions strictly limiting Dr. Richards' evidence to the content of his written reports. I agree with their more liberal approach in questioning their own expert witnesses.

Should an expert's evidence-in-chief include his or her written reports?

71 Defence counsel also objected to the experts' written reports being admitted for their truth as exhibits in evidence. Copies of the reports were filed as lettered exhibits and available to me as an "aide" to assist in following the evidence, but not admitted into evidence as exhibits. The oral evidence was not necessarily as clear or complete as the written reports, making my task to fairly summarize the expert evidence challenging. Does the common law rule, that an expert has the option of filing his report or testifying at the trial, continue after the amendments to the *Rules of Civil Procedure*? Should experts be allowed to prepare affidavits affirming their reports so the report can be admitted as evidence to both streamline trial process and assist the trier of fact in understanding and assessing the evidence? Are there different considerations in judge alone trials and jury trials? If there are differences or omissions between the expert report and the expert evidence, how are the differences or omissions to be treated?

72 I conclude that the defence approach dilutes the intended effect of Rule 53.03 to ensure that expert opinions are clearly and neutrally presented to the trier of fact. This issue is properly a matter for the Civil Rules Committee, or a higher court.

73 In any event, in light of defence counsel's insistence, I considered only the *viva voce* of the expert witnesses for its truth. However, where there was a conflict between the evidence at trial and the contents of the expert report, or if there were omissions in the expert report compared to the evidence given at trial, I conclude that the contents of the expert's report were admissible and relevant to assess the reliability and credibility of the expert's opinion.

Findings of Credibility of Witnesses other than Experts

The plaintiff

74 The plaintiff's actions performing wheelies on November 12, 2005 were admittedly stupid and irresponsible. However, the plaintiff presented as a quiet, stoic, young man. Evidently he has matured since the accident. He worked as a referee, completed first aid courses, and had experienced sports injuries before the date of this accident.

75 The plaintiff did not exaggerate and was not cross-examined in any significant way on his version of events. Some of his sequence of events or timing may not have been correct, and I will note these errors in my outline of

the facts. However, I accept the substance of the plaintiff's evidence as to his condition, complaints, and conversations with the defendant on Saturday November 12, 2005. As well, I accept his evidence of his condition as it progressed on November 13, 2005. I accept his evidence of his interaction with the nurses and doctors at North York General Hospital on Sunday November 13, 2005.

76 Where there is a difference between the evidence of the defendant and the plaintiff, apart from perhaps the sequence of events, I accept the plaintiff's evidence as he remembers vividly this traumatic event in his life. As I will outline, the defendant's memories of treating the plaintiff are quite limited.

The plaintiff's father

77 The plaintiff's father was obviously devastated by the plaintiff's injury. The father blames himself for not taking the plaintiff to the hospital sooner on November 13, 2005 and for not taking his son's complaints more seriously. Clearly nothing was his fault. The father was credible and straightforward in giving his evidence. The defence did not challenge the credibility of his evidence.

78 The father confirms the content of the conversations with the defendant on November 12, 2005, and the defendant's advice after the cast was applied. He also confirms that the plaintiff complained of continued pain, numbness, and swelling after the application of the cast. The father had a conversation with Dr. Orsini after the surgery. I accept his evidence on the content of that conversation as accurate and reliable and it is admissible as part of the *res gestae*.

The defendant

79 The defendant had recently qualified as an orthopedic surgeon in 2005. He received his certificate for practice as an orthopedic surgeon in August 2005, and was admitted by the Royal College of Physicians and Surgeons. The defendant's first job as a qualified orthopedic surgeon was at Scarborough General Hospital commencing August 5, 2005. The defendant was granted courtesy privileges effective August 5, 2005 at Scarborough General including emergency coverage and operating room time for both emergency and elective surgery.

80 The defendant presented as a pleasant, intelligent doctor who gave his evidence in a low-key manner and did not exaggerate what he actually recalled. The defendant had limited memory of meeting and interacting with the plaintiff, described as "flashes." He largely relied on his notes and his usual practice, which I accept as accurate evidence as to what he observed and what he did. It seems clear that the defendant treated the plaintiff's injuries as a routine matter, which may explain why he has limited memory of what transpired.

Dr. Tanzer

81 Dr. Tanzer was the emergency room physician at North York General Hospital. He has 30 years of experience. The defence challenges his evidence and alleges that he is biased in favour of the plaintiff. Counsel points out that Dr. Tanzer's emergency room notes were inadequate, which he acknowledged. Dr. Tanzer testified that he had clear memories of this case as compartment syndrome is an important diagnosis with potentially devastating consequences.

82 I criticize Dr. Tanzer for his inadequate note-taking at the time of these events. Had he taken careful notes, this would have aided both parties in assessing their case.

83 Dr. Tanzer confirmed that the diagnosis of compartment syndrome is one of the true medical emergencies, where correct early diagnosis can make a difference. He likened the importance of early diagnosis of compartment syndrome to the importance of early diagnosis of a heart attack, or an ectopic pregnancy. Dr. Tanzer explained that the time for making notes would be after the events at the end of the day. In this case, by that time, he had made his diagnosis of compartment syndrome, which Dr. Orsini had confirmed, and he knew that the plaintiff was booked for emergency surgery. This does not excuse the absence of notes, but perhaps explains it.

84 Notwithstanding the limited note-taking, I accept Dr. Tanzer's evidence. He had clear memories of his interaction with the plaintiff and what transpired. As he said, emergency room physicians do not see compartment syndrome very often. He made his observations of a tight cast, sent the plaintiff to X-ray on an urgent basis, split the cast, and contacted Dr. Orsini immediately to confirm "we had a compartment syndrome." His evidence of the sequence of events and observations are confirmed in Dr. Orsini's hospital notes, prepared three days following the surgery, long before this lawsuit was contemplated. Dr. Tanzer did his job as an emergency room physician, in spite of inadequate note-taking. His evidence was credible, not exaggerated, and made sense.

85 I do not accept the defence suggestion that Dr. Tanzer was biased as a treating physician. He saw the plaintiff briefly over a 45-minute period and had never met the plaintiff before. The fact that Dr. Tanzer met with plaintiff's counsel in the presence of the plaintiff a few days before the commencement of this trial does not undermine Dr. Tanzer's credibility, and does not support a finding of bias.

Ms. Wilson

86 Ms. Mazie Wilson was the triage nurse who saw the plaintiff when he came to the emergency department of North York General on November 13, 2005. She has no recollection of seeing the patient and interpreted her notes for the court. I accept Dr. Tanzer's evidence that she missed the diagnosis of compartment syndrome as the patient was not moaning or writhing in pain.

Factual Events leading to the Application of the Cast

87 Dr. Richards testified that, when he interviewed the plaintiff, the plaintiff confirmed that at the time of the accident he had completed his grade 12 education, had studied for two years in the police foundation, and was an electrical apprentice.

88 On November 12, 2005, the plaintiff, age 21, and his friends were out on a fine day for a motorcycle ride from Hamilton to Toronto. At the end of their ride, one of the plaintiff's friends studying film wanted to videotape his other friends performing tricks on their motorcycles for a school project. They went to a parking lot behind a Scarborough hockey arena to perform stunts while being videotaped.

89 The plaintiff described doing slow "safe" wheelies on his motorcycle. Clearly, there is no such thing as a safe wheelie. As there was uneven ground, the plaintiff's motorcycle got caught in a rut while the plaintiff was on one wheel. He lost control of the bike. He fell on the accelerator of the motorcycle and it sped out of control, travelling at an estimated 40 to 50 km per hour with the plaintiff holding on to the handlebars. The plaintiff's motorcycle hit one of the two vehicles in the parking lot, a hummer, causing the hummer to displace two feet. The plaintiff turned his head to avoid injury and impacted the hummer primarily with his right wrist. He also experienced minor injuries to his left shoulder and ankle. His motorcycle was a write-off for insurance purposes.

90 The observers in the parking lot called 911. The fire department and ambulance arrived shortly thereafter. The paramedic confirmed that the plaintiff had a right wrist injury. The plaintiff was placed on a stretcher, after his right wrist was put in a temporary support, and was taken to the Scarborough General emergency department. The paramedic's notes of the incident describe the accident and confirm that the right wrist was "swollen with altered sensations" (emphasis added).

91 A nurse at Scarborough General saw the plaintiff at 2:06 p.m. The plaintiff complained of pain and the nurse observed swelling in the wrist area.

92 While at the hospital, he was questioned by the police and charged with dangerous driving. The plaintiff acknowledged to his father later that day that his actions were stupid.

93 The plaintiff did not remember seeing another doctor before he met with the defendant. The plaintiff was

probably mistaken. He probably met with the emergency room physician, Dr. Jyu, who called the defendant to come to the emergency department to see the plaintiff. Dr. Jyu prescribed various pain medication including intravenous morphine, gravol, and intramuscular toradol. Dr. Jyu's medical records were before the court but he did not testify. Dr. Jyu's notes do not indicate a time that he met with the plaintiff; whether the plaintiff or a nurse provided Dr. Jyu with the information recorded in the hospital record; or whether in the circumstances he may have directly contacted the defendant, who was the orthopedic surgeon on call.

94 The defendant was one of five orthopedic surgeons who performed call service for the Scarborough General emergency department. He was on call on November 12, 2005. The defendant confirmed that Dr. Jyu contacted him to come and see the plaintiff.

95 The defendant had very limited specific recollection of treating the plaintiff on November 12, 2005.

96 When asked in chief about his independent recollections of this meeting with the plaintiff, the defendant stated that he did "not remember all the details" but is assisted by his notes. His evidence was largely what he would have done, as opposed to a specific memory of what he did.

97 The defendant prepared notes of his involvement with the plaintiff on November 12, 2005 at 5:30 p.m. The defendant did remember what he described as flashes of detail, such as discussing motorcycles and cars and that the plaintiff waved goodbye after treatment with his hand elevated. The defendant relied upon his notes and his usual practice to provide evidence of what he would have done and the treatment rendered.

98 His notes of the initial contact with the plaintiff provide as follows:

20 yo (year old) (male) RHD (right hand dominant) pHx (Past history): (R) (right) shoulder stabilization meds (none) NKDA (No known drug allergies)

RFR (Reason for referral): (R) (right) DR (distal radius) # (fracture)

HPI (History Presenting Illness): Riding motorcycle today, collided with parked car, (no) L.O.C. (loss of consciousness), (no) HI (head injury) (no) bleeding, c/o (complaint of) (R) (right) wrist pain and left ankle pain.

O/E (on examination): NAD (no apparent or acute distress), A + O (alert and oriented) x3 (time, space & person)

Seen by ER (Emergency) physician and cleared

RUE (Right Upper Extremity) (no) shoulder tender, mild tender (R) (right) elbow

+ swollen, deformed (R) (right) wrist, global numbness fingers

Motor ulnar/median/radial, pulses vv, cap refill (capillary refill) v

X-ray: (R) (right) DR (distal radius) # (fracture), displaced

Procedure: Hematoma block, CR (closed reduction), SAC (short arm cast)

99 The plaintiff described the accident to the defendant. The plaintiff described a lump on the right side of his hand the size of a toonie, approximately one half inch high.

100 I accept that this lump was the distal radius that had been displaced. I also accept the plaintiff's evidence that, in addition to the lump of bone, there was noticeable swelling in the right wrist area as had been confirmed by the paramedic and the admitting nurse.

101 The defendant's notes confirmed that the plaintiff collided with a parked car and that he complained of right wrist pain. His initial observations confirm that the right wrist was described as "+ swollen" with "deformed" right wrist and "global numbness fingers."

102 The plaintiff testified that, when the defendant examined him, he complained of pain all around his wrist, numbness, and pins and needles, particularly on the right side of his palm and his pinky and ring fingers. The plaintiff found these symptoms scary and alarming. The plaintiff testified that the defendant told the plaintiff that it was normal to have pain, numbness, and pins and needles with a high impact injury. The defendant suspected a broken wrist.

103 The defendant testified that this was a concussive type of injury from hitting the hummer vehicle, and the global numbness was not in keeping with nerve damage *per se*.

104 The defendant examined capillary refill to ensure that the blood supply to the fingers was normal.

105 The plaintiff was sent for X-rays. After the initial X-rays were done, the defendant confirmed that the wrist was broken, there were two major bone fragments, and the fracture was into the joint. The plaintiff testified that the defendant told him that the impact was so great that the plaintiff's hand had been pushed back into the wrist and that one bone had been pulverized into tiny fragments, almost like a crush to dust.

106 The experts relied on the X-rays to describe the injury as a dinner fork fracture. The radius bone was significantly displaced by over one centimeter. There were two large fracture fragments, including the styloid of the distal radius and the lunate facet.

107 The plaintiff complained of pain and asked for further medications. Pain medications were injected into the intravenous bag.

108 Next in the sequence of events, the defendant performed a closed reduction to the wrist. The reduction of displaced fractured bones involves a series of manipulations. The reduction ideally aligns the bones into the correct anatomical position, after injecting a hematoma block to freeze the joint area.

109 The plaintiff and the defendant disputed whether one or two attempts at the reduction took place.

110 The defendant acknowledged in his examination for discovery that he had no specific memory of the treatment that he gave, and testified as to his usual practice. He testified that there was only one reduction performed, but that given the manipulations on two planes the plaintiff could have mistaken it for two reductions.

111 The plaintiff remembered vividly that he was told that the reduction was going to "hurt like hell." He was told on two occasions to count to 20 as the defendant performed the maneuvers to perform the closed reduction. The first attempt was unsuccessful. The defendant was frustrated and winded after the first failed attempt. The plaintiff testified that the defendant said "you're going to hate me now, because we're going to have to do it one more time."

112 Dr. Taylor confirmed that it is not uncommon to have to perform more than one attempt for a closed reduction. The experts assumed in their reports that there was a difficult reduction with two attempts to perform the closed reduction to align the bones. The experts agree that to perform a closed reduction requires considerable force.

113 I accept the plaintiff's evidence that it was necessary to perform the closed reduction twice, as he has a clear memory of the events.

114 The plaintiff testified that the swelling and pain became significantly worse after the closed reduction. The plaintiff testified that his wrist was uniformly swollen and he was in a lot of pain.

Application of the Full Circumferential Cast after the Closed Reduction

115 After performing the closed reduction, the defendant told the plaintiff that his wrist was set, and that he was

going to cast him. The defendant then applied a closed circumferential cast to the plaintiff's right lower arm. There is no evidence before me of the exact measurements of the cast, but it did not cover the entire forearm.

116 The defendant acknowledged in cross-examination that he applied a full circumferential cast in this case, as that was his standard practice in all situations:

- Q. All the fractures of this type you told us about all the fractures you saw coming out of the canal in Ottawa and all the fractures you have seen wherever you have been, you put casts on them?
- R. Yes.
- S. Because that is the general way in which you do it?
- T. That's the way I have done it. That's the way I was trained. That's my experience yes.
- U. Okay, so rather than look at the individual and what injury that person had individually and the type of complaints that person has individually, really what you're doing is putting that individual into your normal practice with everybody? Is that right?
- V. My normal practice is to cast distal radius fractures after I reduce them, so yes.
- W. You wouldn't do anything different with say, a person under the age of 35 with a high energy injury that's male? You wouldn't reconsider that person compared to someone else?
- X. Not in this setting, no. [Emphasis added.]

117 The defendant acknowledged that his choice of the full circumferential cast did not take into account the plaintiff's age, sex, or the fact that this was a high impact injury.

118 Before the plaster was applied, the plaintiff confirmed that the defendant had wrapped a soft cottony material around his arm like a tensor bandage. The plaintiff described the cast application like putting on pieces of paper mâché, with the application of strips followed by an Indian sunburn-type motion.

119 The defendant did not recall putting the plaintiff's cast on, but he knew that he did it. The defendant then described his usual procedure in applying casts. The defendant said that he normally would put on two rolls of web roll, but that he probably put on three rolls in this case. I find that he has no specific memory of how many web rolls he applied to the plaintiff.

The Second Set of X-rays taken after the application of the Cast

120 After the cast was applied, further X-rays were taken to review the status of the plaintiff's wrist after the closed reduction. It appears that the defendant correctly ordered two X-rays of both relevant views. Scarborough General Hospital initially produced only one X-ray. The radiologist's report dated November 12, 2005 however confirms that two views were taken once the cast had been applied.

121 The X-rays taken after the cast was applied clearly confirm that the distal radius styloid was successfully anatomically aligned after the closed reduction, but that the lunate facet fracture piece was not. The experts agree that the post-reduction X-rays after the cast was applied confirm that the lunate facet was not aligned, was depressed, and located in the articular area below its correct anatomical position. After the closed reduction, the lunate facet bone fragment was rotated 180 degrees.

122 The defendant testified that the lunate facet was comminuted, that is, the bone was compressed and crushed into many fragments.

Discussions of Treatment Options that took place after the Cast was applied and the Second Set of X-rays was Available

123 I accept the defendant's evidence that, after receipt of the second set of X-rays, the primary discussions about treatment options took place. Some discussions took place initially with the plaintiff alone, and later with the plaintiff and his father. There may have been some preliminary discussion between the defendant and the plaintiff alone about potential surgery options after receipt of the first set of X-rays before the cast had been applied.

124 This finding as to the sequence of events is not based specifically upon the defendant's actual memory. Rather, it is based on the defendant's notes and the experts' descriptions of the logical sequence of events that would take place.

125 Logically, the treatment options would be discussed after the results of the closed reduction were known. The father confirmed that treatment was discussed after he arrived at the hospital when his son was sitting in a wheelchair, after the cast had been applied. The X-rays were available and shown to him during this discussion.

The Defendant's Evidence about Treatment Options after the Cast was applied

126 The defendant's notes about treatment options discussed on November 12, 2005 are outlined as follows:

Post - X-rays: Good alignment, comminuted lunate Fossa with lunate depression

D/W (discussed with) Patient and Father diagnosis, recommended Ex-Fix (external fixator) and pins with +/- (possible) ICBG (iliac crest bone graft). Patient and Father would like to be treated at North York Hospital by Family orthopedic surgeon.

P (Plan) - F/U (follow up) Dr. Ali 1/52 (1 week) or North York.

Getahun

Signature of Consultant

127 The defendant confirmed that he discussed with the plaintiff a procedure, apart from the external fixation, to take some bone from the hip to reconstruct the wrist to fill the void created by the crushed bone. The defendant testified that he could not know definitively whether the bone graft was necessary until the surgery began. The defendant did not have a specific memory of this discussion, but described "bits of memory." He remembered that they decided they did not want him to proceed with the surgery. The plaintiff and the father wanted Dr. Orsini to treat the plaintiff at North York General Hospital.

128 The defendant testified that he confirmed with the plaintiff that he was available to do the surgery the night of November 12, 2005. He had confirmed that the operating room and necessary machines were available.

129 The defendant testified that he advised, if the plaintiff was unable to get a second opinion or if he was unhappy with that opinion, that either he or his partner, Dr. Ali, could perform the surgery on Wednesday November 16, 2005.

The Plaintiff and the Plaintiff's Father's Evidence about the Recommended Surgery

130 The plaintiff testified that, after reviewing the second X-rays, the defendant confirmed that he was happy with how the wrist was set. However, the defendant told the plaintiff that he would need surgical fixation to stabilize the still displaced fracture in the wrist by wires and supports inserted on two planes: one horizontal and one vertical.

131 The defendant also told the plaintiff that he recommended taking a piece of bone out of the hip to insert into the wrist, and that the function of this bone graft was to increase mobility in the wrist.

132 The plaintiff was concerned about the defendant's youth and lack of experience. Before his father arrived at the hospital, the plaintiff asked the defendant how long he had been qualified as an orthopedic surgeon. The defendant told him that he was a first-year specialist with one year's experience, or that he was in his first year of practice as a specialist. In fact, the defendant had been working as a qualified orthopedic surgeon for less than four months.

133 The plaintiff understood that the defendant could do the surgery that night or the next day.

134 The plaintiff's evidence is that the recommended bone graft seemed like a "big ordeal." It was the recommendation for the bone graft that primarily caused hesitation and concern for both the plaintiff and his father. The plaintiff testified as follows:

- A. No, like I said, the surgery was discussed before he reduced my wrist.
- B. Whenever it was discussed, the thing that stuck out in your mind was the possibility that you're going to have a graft done?
- C. What stuck out in my mind the fact that it seemed like a very big ordeal. I still am not too sure what bone graft means, but I just remember the idea of taking a bone out of my hip, placing it in my arm, then having all these other bars put on my arm. It seemed like a pretty serious ordeal.
- D. Right. So, taking the bone from your hip and putting it in your arm, that possibility sticks out in your mind still today?
- E. Yes, it does.
- F. Rather like the possibility that your arm might be amputated when you talked to Dr. Orsini, sticks out in your mind today.
- G. Yes, it does.

135 When the plaintiff's father arrived at the hospital, the plaintiff was having the cast applied. When the plaintiff returned to the waiting room with his cast before the defendant arrived, the father spoke briefly with the plaintiff about how the accident happened. The defendant arrived and introduced himself as "Dr. Tajedin," using his first name.

136 The father testified that the defendant told the father that he had been a doctor for about five years. The defendant recommended that his son have an operation taking a piece of bone from his hip to put into his wrist to give him a larger range of motion.

137 The father did not remember any discussion about surgery being necessary for external pinning. He remembered that the defendant told him that he had set the wrist. The father understood, from what he had been told by the defendant, that the bones were in place as well as they could be, and the suggested bone graft surgery was to increase the range of motion in the wrist.

138 I accept the evidence of the plaintiff and the plaintiff's father that the concerns triggering the request for a second opinion were the defendant's youth and inexperience, and the apparent "drastic" nature of the recommended bone graft. The father's brother has cancer. He has learned through helping his brother the importance of a second opinion about recommended treatment.

139 The father did not remember any discussion about the necessity of external fixation. This part of the conversation may well have taken place with the plaintiff alone. Alternatively, the father forgot this aspect of the recommended treatment as he was told that the wrist was set and the proposed bone graft was the primary concern generating the desire for a second opinion.

140 The plaintiff in his father's presence asked the defendant how much time he had to make a decision about the proposed surgery. The plaintiff wanted to get a second opinion from Dr. Orsini, who had performed surgery on the plaintiff's brother. The plaintiff had experienced other sports injuries and had been treated at North York General. He felt comfortable being treated there.

141 The defendant told the plaintiff in his father's presence that he had one week to get another opinion and proceed with the surgery.

The Recommended Bone Graft

142 There is a dispute between the evidence of the plaintiff, the plaintiff's father, and the defendant about whether a clear recommendation was made to have the bone graft surgery, or whether this was only a possible recommendation and an option to increase range of motion.

143 The defendant's notes about discussed treatment options stated, "recommended" external fixator "and pins with +/- ICBG (iliac crest bone graft)." The defendant indicated that the symbol "+/-" means "possible." The defendant has no recollection of the specifics of any conversation that took place.

144 I find that the plaintiff and his father understood that the recommended bone graft was a firm recommendation for treatment, but perhaps the defendant viewed the procedure as only a possible course of conduct.

145 I do not agree with the defence counsel's suggestion that the plaintiff's evidence was that the bone graft surgery was merely possible. The word "possibility" was in counsel's question, not in the plaintiff's response.

- Q. Whenever it was discussed, the thing that stuck out in your mind was the possibility that you're going to have a graft done?
- R. What stuck out in my mind the fact that it seemed like a very big ordeal. I still am not too sure what bone graft means, but I just remember the idea of taking a bone out of my hip, placing it in my arm, then having all these other bars put on my arm. It seemed like a pretty serious ordeal.

146 If the defendant viewed the bone graft as only a possible recommendation, I find that it was not adequately explained to the plaintiff and his father. It was this aspect of the procedure that seemed drastic and was the plaintiff's primary concern.

The Plaintiff's Symptoms at Discharge and the Instructions Received for Care

147 After putting on the cast, the defendant performed an examination to ensure adequate circulation by pressing down on the plaintiff's fingernails and releasing pressure. The plaintiff agreed in cross-examination that this examination was thorough.

148 The plaintiff complained of extensive pain both after the closed reduction and after the cast had been applied that was not diminished or relieved by putting on the cast. The plaintiff continued to complain of numbness after the cast was applied. When the plaintiff asked the defendant about the degree of swelling and pain he was experiencing, the defendant told him that this was normal or standard for high impact injuries, especially after reduction.

149 The defendant told him that continued numbness and pain were normal for two to three days after the cast had been put on. If the numbness and pain continued after two to three days, the defendant advised the plaintiff that he should get the situation checked out. The father confirmed that the defendant told the plaintiff to take pain killers. If there was still numbness and swelling by Wednesday, the defendant told the plaintiff to return to the emergency department.

150 The defendant acknowledged that a cast could become tight after it is applied due to increased swelling, and this was a very common occurrence. In the fracture clinic, complaints of casts being too tight are the most common presentation. The solution is to split or bivalve a cast that is too tight.

151 Before the plaintiff left the hospital, the cast technician asked him how the cast felt. The plaintiff responded that he was in a lot of pain and that he "couldn't really feel much of anything. It was just really sore." He could feel the cast, but did not know if the cast was too tight or not, as his focus was on the pain.

152 The plaintiff testified that the defendant told the plaintiff to ensure that the cast was kept clean and dry, to keep the arm elevated, and to read the pamphlet provided about cast care. The father confirmed this advice. The plaintiff did not remember being told to keep his fingers moving. The plaintiff did remember being told to keep the arm elevated, and to use pillows at night to support and elevate the arm.

153 The defendant confirmed the plaintiff's evidence, but added that he told the plaintiff to keep his fingers moving.

154 The plaintiff knew to be concerned if swelling got worse, but he was told to expect continued swelling and pain for two to three days. The plaintiff knew that if the cast was too tight he should go to the emergency department to get it checked.

155 The plaintiff was given a pamphlet about cast care. He read the pamphlet, which provides as follows:

Your cast is made either of plaster or fibre-glass (a special material that is stronger and more durable).

- * A plaster cast takes 2 days to dry.
- * If you have a plaster walking cast, DO NOT walk on it for 2-3 days.
- * You may walk on the fiberglass cast right after it has been applied.
- * Your cast may be left on anywhere from one to five weeks. Your doctor will tell you when it will be removed.
- * You may need aids such as a cane or crutches. These can be purchased at the hospital or through a local health care merchant.
- * Bring your walking aid with you to each clinic visit.

CAST CARE

- * Keep your cast dry.
- * DO NOT put your cast into water.
- * DO NOT use anything to scratch under the cast. DO NOT stick anything inside your cast. This may damage your skin and could cause an infection.
- * DO NOT remove or adjust the padding under the cast.
- * Never trim the cast yourself.

If you shower:

- * Wrap a towel around your cast, then wrap the cast in a double plastic bag, and tie the top end securely.

TO PREVENT SWELLING

- * If you are sitting or lying down, raise your arm or leg with the cast as much as possible in the first few days.
- * Move your fingers or toes often to reduce swelling and to prevent your joints from becoming stiff.

CAST REMOVAL

The cast must be removed in the clinic unless you have been told otherwise by your doctor.

CALL THE FRACTURE CLINIC OR GO TO YOUR NEAREST EMERGENCY DEPARTMENT:

- * If the swelling is severe or your fingers or toes are blue.
- * If you have severe pain.
- * If your fingers or toes are tingling or feel numb ("pins and needles"), or you are unable to move your fingers or toes.
- * If you have a burning feeling and a foul smell or drainage from the cast.
- * If the cast feels too tight or snug.
- * If the cast breaks or becomes very loose.

156 The plaintiff testified that, when he left the hospital in the evening of November 12, 2005, he was in severe pain and he was experiencing swelling and tingling on the right side of his palm, pinky finger, and ring finger. He confirmed his symptoms with the defendant. The plaintiff testified that the amount of pain was alarming to him after the cast had been put on. However, the defendant told him on two or three occasions that the pain and swelling were normal for this kind of injury and that the symptoms would last for two to three days.

157 The plaintiff and his father waited for approximately one hour to get the disk with the hospital chart and X-rays to take to Dr. Orsini. The equipment for burning the disk was malfunctioning so the plaintiff and his father returned home without the disk. The father intended to return the next day to get the disk, in anticipation of an appointment with Dr. Orsini probably on Monday November 14, 2005.

No Specific Warning of Compartment Syndrome

158 Prior to leaving the hospital, the evidence is clear that there was no discussion between the defendant and the plaintiff about possible compartment syndrome, or the serious ramifications that could occur after a high impact injury such as his.

159 It is clear that the defendant gave the standard instructions about cast care to the plaintiff (to keep the cast clean and dry so it could do its job) and provided the hospital pamphlet. No one reviewed the pamphlet with him, but the plaintiff did read the pamphlet.

160 The plaintiff was not told that he was at increased risk of complications from his high impact injury. The plaintiff's evidence was that, if he had been advised that he could or would have serious complications from delayed surgery, that information would or could have affected his decision not to have the surgery that night.

161 It is clear that the plaintiff and his father were not educated about any special risk applicable to the plaintiff's situation as a young man who had a high impact injury with surgery contemplated. The plaintiff was told in his father's presence to expect continued pain and swelling for two to three days. The plaintiff understood that he had a week to get a second opinion about the surgery. He did not understand that there was any urgency beyond the one-week limit to have the surgery.

Factual Events after the Plaintiff left the Hospital and on November 13, 2005

162 The father filled the prescription for Tylenol 3. As instructed, the plaintiff kept his arm elevated. His arm was buttressed by pillows to maintain the elevation. He took his medication and, with some difficulty after the medication came into effect, went to sleep.

163 The plaintiff slept through the night and awoke at 7:30 a.m. He was in significant pain that had increased from

the night before. The swelling had also increased. The plaintiff testified that his hand was twice the normal size. He described a throbbing in his arm in time to his heartbeat. Taking the pain medication did not help.

164 The father had gone to the basement to not make any noise that might disturb his son. At around 9:30 a.m. the father saw his son who complained that his wrist was "really sore. Its really starting to swell and it was really numb."

165 Based upon the defendant's advice to expect pain and swelling for two to three days, and without any specific warning about the possible development of compartment syndrome, the plaintiff's father initially reacted that his son's pain and swelling were to be expected.

166 The plaintiff however felt that "something was not right." Thankfully, he asked to go to the hospital as he was experiencing excruciating, throbbing pain.

167 The father drove the plaintiff and his girlfriend to the hospital and dropped them off. The plaintiff and defendant gave evidence that they arrived at the hospital between 10:00 a.m. and 10:30 a.m. The first entry on the hospital records at registration, when the plaintiff's OHIP card was swiped, was at 11:26 a.m. with the nature of the problem described as "Cast problem." It appears that they probably arrived at the hospital some time before 11:26 a.m.

Meeting with the Triage Nurse

168 The plaintiff met with the triage nurse, Ms. Mazie Wilson, from 11:55 a.m. to 12:03 p.m. Ms. Wilson testified at the trial. She had no recollection of this case, but interpreted her notes for the court.

169 Ms. Wilson noted, "c/o [complains of] cast too tight, had mva yesterday seen at Scarborough General. c/o fingers swollen and painful, able to move fingers, warm to touch, wants to see ortho at NYG." Ms. Wilson's notes of her observations confirm that the plaintiff was a well-nourished, oriented person with "no acute distress and no obvious discomfort." When questioned on these notes, she said that no acute discomfort meant that he was not moaning or writhing in pain. The defence relies on the triage nurse's notes of "no acute distress and no obvious discomfort" in support of their argument that compartment syndrome developed after the cast had been removed.

170 The plaintiff testified that, in his meeting with the nurse, he was not crying or writhing in pain. However, he told the nurse that he was in a lot of pain and that it was severely painful. It appears that he was overly stoic in the circumstances. Had he been made aware of the potential complications of compartment syndrome from a high impact injury, he may have been less stoic and more insistent in his meeting with the triage nurse.

171 Ms. Wilson assessed the urgency of the situation as low-four out of a possible five. The emergency room physician who later saw the plaintiff, Dr. Tanzer, testified that in his view Ms. Wilson erred in assessing the urgency of the situation, and missed the diagnosis of compartment syndrome. He bluntly stated "this patient was not triaged properly." Her error may have been partly as a result of the plaintiff's low-key, stoic approach compared to the mainstay of patients attending the emergency department, coupled with his lack of insistence of the potential gravity of the situation, as he had not been educated about compartment syndrome.

Meeting with the Emergency Room Physician

172 The plaintiff testified that, after seeing the triage nurse, the pain and swelling got worse. He showed his wrist to another nurse in the area of the hospital where he had been directed to go. She told him that he had to wait his turn. According to the plaintiff, the hand at this point was greenish blue and the swelling had increased to three times its normal size.

173 The plaintiff did not sit back. He was very concerned and spoke to someone in an all-white jumpsuit who appears to have been a cast technician. The technician took one look at the plaintiff's hand and said that this was not right and immediately got hold of Dr. Tanzer, the emergency room physician on duty.

174 Dr. Tanzer saw the plaintiff at approximately 1:15 p.m. out of turn as a result of the cast technician's intervention. Dr. Tanzer had a memory of this patient and what transpired, but his written records of his interaction with the plaintiff are substandard.

175 Dr. Tanzer ordered X-rays which were available at 1:44 p.m. Dr. Tanzer said the injuries were so dramatic that he sent the plaintiff immediately to X-ray to see what he was dealing with before he split the cast. He acknowledged that he could have split the cast before sending the plaintiff to X-ray.

176 Dr. Tanzer observed in the X-rays that the lunate facet fragment was not aligned and was pushing into the volar space. He described the distal fracture piece that was not aligned as being "a significant piece of bone."

177 The plaintiff testified that, upon Dr. Tanzer reviewing the X-rays, Dr. Tanzer expressed that he was not happy with how the wrist was set. Upon his review of the X-rays, he observed that the fracture had not been properly anatomically reduced, and the bone piece was pressing on tissue which would cause added swelling.

178 The full cast caught Dr. Tanzer's attention because in his experience full casts are not used in Toronto:

- A. You are not just looking for one thing, you are looking at the whole picture of everything and when I was a cylindrical cast one, I am -- my eyes just light up immediately.
- B. But this is why you take the cast off...
- C. Yeah.
- D. That's what I was -- that's why we -- that's why we split it. [Emphasis added.]

179 Dr. Tanzer also testified that he made the observation that the cast was too tight. Dr. Orsini's handwritten notes appear to indicate "slight." Dr. Tanzer could not interpret Dr. Orsini's notes, but Dr. Tanzer testified in cross-examination that "I would not have split the cast if it was slightly tight." Dr. Tanzer instructed the cast technician to split the cast to relieve the pressure, with the exception of a slab on the lower arm to continue to support the wrist. His working diagnosis was compartment syndrome. The cast technician did not cut off the soft roll.

180 I accept Dr. Tanzer's evidence about his observations when he interacted with the plaintiff between 1:15 p.m. and 2:00 p.m. on November 13, 2005. He confirmed that the plaintiff was in significant pain, had very little hand movement, and any movement caused pain. Dr. Tanzer did not check the pressure in the compartment and did not do a passive stretch to test for compartment syndrome as he was confident in his working diagnosis of compartment syndrome. The passive stretch test is very painful if compartment syndrome is present.

181 Based upon the preliminary working diagnosis that compartment syndrome was developing, Dr. Tanzer took steps to split the cast. Dr. Tanzer hoped that splitting the tight cast would reduce the symptoms so that the developing compartment syndrome would not become irreversible. Dr. Tanzer testified that, if the cast was just a little bit too tight, then splitting the cast and elevating the arm could relieve the pressure and pain, and stop the symptoms and the process.

182 Unfortunately there was no noticeable reduction in pain and swelling after the cast was split. Dr. Orsini happened to be on call and was in the operating room that day. Dr. Tanzer called Dr. Orsini to advise him that "we had a compartment syndrome" and he required immediate attention. Dr. Orsini was in surgery at the time, but Dr. Tanzer left the message for him directly to expedite the process.

183 Dr. Tanzer testified that he recalled that the plaintiff's hand was bluish colour. This evidence was not in Dr. Tanzer's notes. He met with the plaintiff at the lawyer's office before the commencement of trial and this may have been discussed. I am not sure about this aspect of his evidence as it may have been discussed with the plaintiff

prior to the trial. I am confident about accepting as accurate all of Dr. Tanzer's other observations based upon his clear memory of events.

184 However, I accept the plaintiff's evidence that, while he was waiting to see Dr. Tanzer, his hand was swelling abnormally and was turning bluish green in colour.

Meeting with Dr. Orsini and Subsequent Surgery

185 Dr. Orsini examined the plaintiff approximately one hour later after the cast was removed, somewhere between 2:00 p.m. and 3:00 p.m. on Sunday November 13, 2005. He again examined the plaintiff before the surgery sometime near 5:00 p.m.

186 Dr. Orsini advised the plaintiff at the initial meeting that he believed that the plaintiff had a compartment syndrome that would require surgical intervention in the form of a fasciotomy to relieve the pressure.

187 Dr. Orsini's inpatient operative report states the following:

The following day he had increasing pain and came to North York General Hospital and his cast was split by Dr. Russel Tanzer in the Emergency Department. He had really no significant relief of his pain. At this point he had significant pain, numbness and weakness of his entire right hand. He did have hand weakness and numbness following his injury but it had worsened with the tight cast. [Emphasis added.]

188 Dr. Orsini's redacted expert report dated July 27, 2006 confirmed his observations pre-op that "he was noted to have decreased sensation in his radial, median and ulnar nerve distribution of his hand. He could move his digits but very minimally. His hand was warm and pink. He had some passive stretch pain."

189 It is unclear whether Dr. Orsini observed the hand being warm and pink when he first saw the plaintiff somewhere between 2:00 p.m. and 3:00 p.m., or when he later met the plaintiff around 5:00 p.m.

190 As the plaintiff stated, Dr. Orsini did not have a bedside manner. When Dr. Orsini initially met with the plaintiff, he warned him that there was a chance that he would wake up without his arm, as it may be necessary to amputate.

191 Dr. Orsini told the plaintiff prior to the surgery that the defendant's suggested bone graft surgery was in his view premature and was only to be considered "down the road" as a "last ditch effort."

192 At 5:00 p.m. on November 13, 2005, the father got a call that the plaintiff was going to have emergency surgery. The father went immediately to the hospital but did not see his son before the surgery.

193 Dr. Orsini proceeded with the surgery at 6:30 p.m. until 9:13 p.m. on an urgent basis. On November 13, 2005. Dr. Orsini confirmed that the plaintiff was taken to the operating room with questionable nerve injury, fracture dislocation of his right wrist, and possible compartment syndrome.

194 Dr. Richards confirmed that a 100% diagnosis of compartment syndrome cannot be made until the compartment is exposed during the surgery.

195 Dr. Orsini's interim summary dictated after the surgery on November 16, 2005 confirmed his observations before the surgery:

[The plaintiff was] seen at Scarborough General Hospital, assessed and discharged with a circular cast. He came to North York General Hospital the next day with numbness and increasing pain. The cast was split and I was asked to see him. At the time he had significant nerve injury with possible pressure from the boney fragment. He had minimal movement of his hand, passive stretch pain. He was taken to the

Operating Room and forearm fasciotomy was performed, opened and external fixation reduction of his right wrist. [Emphasis added.]

196 Dr. Orsini's operative note provides as follows:

Under general anesthesia and secure airway the right hand and forearm were prepped and draped. There is extreme swelling in his forearm particularly volarly. I was concerned about the compartment syndrome. After making the skin incision there was edema in the subcutaneous tissue. The area was eventually released up to elbow including the lacertus fibrosus. This was done using the right angle undermining the skin. Distally I went to the distal end of the carpal tunnel. The median nerve appeared to be intact. There was a bony fragment just on the ulnar side of it. The superficial and deep compartments were released within the volar compartment. Just at the end of the procedure the dorsal compartments were released using a dorsal incision. No tourniquet was used.

The muscles seemed to be viable, red, bleeding and contractile.

The fracture of the wrist itself was identified. The fragment had been rotated 180 degrees and I had to translocate the wrist dorsally to reduce the fragment. There also appeared to be a radial styloid fragment. The distal radioulnar joint soft tissues also were disrupted.

Using the image intensifier, a small Hoffman frame was constructed and applied. The wrist was stable in volar flexion. Two K-wires were then used to secure the ulnar articular fragment of the radius. There was some mild comminution in the area. With this position, image intensification demonstrated a good reduction.

The dorsal incision was closed leaving the volar incision for the most part wide open. Normal saline, gauze and dressing was applied.

The patient tolerated the procedure well and left the operating room in stable condition.

I spoke with his family regarding the issues of compartment syndrome and that hopefully a full recovery will be obtained although its hard to know how long the compartment syndrome was present complicated by his nerve injury.

Admissibility of the Conversation between Dr. Orsini and the Plaintiff's Father

197 After the surgery, the plaintiff was happy to wake up with his arm. His arm was completely bandaged and he could not see the extent of his injury.

198 Dr. Orsini spoke to the father after surgery. He explained the surgical procedures that had taken place, including the two incisions leaving scars measuring 27 cm long and 23 cm long on the top and bottom of the plaintiff's arm.

199 The defence objected to the admissibility of the conversation between Dr. Orsini and the father that touched upon standard of care or causation. I allowed the contents of the actual conversation to be included in the evidence, with arguments to follow about its admissibility and weight.

200 The following is the father's testimony about his conversation with Dr. Orsini immediately after the surgery:

Q. And then were you told at the hospital what the cause of that surgery was?

R. Yes.

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MS. KUEHL: Your Honour, I think that the advice received about the cause is soliciting from this expert ...

THE COURT: I am allowing the doctor - I am going to allow the information about the conversation to go in and I will hear your arguments later about what is to be done with it.

MS. KUEHL: Thank you.

MR. REGAN: Q. What was the conversations you had with the doctor about why?

- A. When he first came out, Dr. Orsini came out into the waiting area and I stood up and he said, "Mr. Moore?" And I said, "Yes." And he said - he told me that - about the surgery. He said he had to make the two incisions. He said - he said he had to make the top one, he said, which he could close to release the pressure, but the bottom one was just the result of that first picture and it has to stay open. It was going to be an awful scar. He said - I asked him what happened. He said - he said, "The cast never should have been put on, as it was far too tight. He told me that the swelling had nowhere to go." He says - so, he says, "It went in" and he said, "What happened", he says, "is it killed the flesh in your son's arm." I said, "Well, the doctor said he set the wrist." And he said, "No, he didn't set the wrist. He made it worse" and he said he managed to catch the nerve between the bones and damaged the nerve as well. He says, "I repaired the wrist." And I said, "Well, the other doctor said he was going to take a piece of bone out of his hip and repair his wrist with that." And he looked at me he says, "I never would have considered an operation like that for this kind of damage." And I said, "What's his prognosis?" And he said, "He's going to have permanent damage" and that - and he looked at me and he was all red-faced and he said, "I am sorry." He said, "Whoever did this", he said, "butchered your son." And that's what he told me.
- B. When you were at the Scarborough General, you told us what was said to you?
- C. Yes.
- D. Had the - had you or your son been advised that there could be some complications if surgery was not done right away? What, if any, your answer had been to that?
- E. No, we were told we were given a week. I was told that my son's wrist was set and he recommended that we have a surgery to increase his range of motion and that we had a week - and that we had until Wednesday, if he was experiencing pain, to come in on Wednesday. Dr. Orsini told me when I told him that, Dr. Orsini told me, he said, "Mr. Moore", he said, "when I looked at Blake", he said - he says, "I thought maybe I could wait to do the surgery until Monday morning" he said, "but then I realized it would be taking his arm off." He said - he said, "Blake probably wouldn't have woken up on Tuesday." He said, "He wouldn't have made it to Wednesday", he said. [Emphasis added.]

201 In cross-examination, the father responded to defence counsel's questions regarding this conversation as follows:

- Q. And did - you told us about a conversation you had with Dr. Orsini after your son's surgery?
- R. Yes, when he came out of the operating room.
- S. And you said Dr. Orsini talked about flesh on your son's arm, that there was killed flesh?
- T. Yes, he used the word necrotizing, or something like that. That the - he told me that the arm was dying. The blood flow was cut off and the arm was dying.
- U. And are you aware that Dr. Orsini's operative note indicates the muscle in his arm was red viable and bleeding?
- V. No, I don't know that, because I don't know his - I never read his notes.
- W. And are you aware that his operative note does not refer to killed flesh or necrotized flesh?
- X. What he told us was that Blake was going to have his arm open and they were going to have to keep it open and anything was going to have to be cleaned out until they could close it.
- Y. And you said Dr. Orsini told you that he thought he could do the surgery on Monday?
- Z. He said when he first saw Blake he thought he could do the surgery on Monday morning, but then he realized on Monday morning he would be removing Blake's arm, so he had to do it that night.
- AA. So, your understanding was his initial plan was to do the surgery on Monday?
- BB. No, his initial plan was that he thought he could do it Monday, but that when he took a really good look at him, he realized he had to do it that night.
- CC. When he took a second look at him?
- DD. No, when he took a really good look. He said when he first saw Blake, he thought that he could wait until Monday morning, but then when he took a look at him - a good look at him, he said he realized he had to do it that night. He couldn't wait until Monday morning, because he said on Monday morning he would be taking the arm off.

MS. HUNTER: Thank you. Those are all my questions.

202 The father was a credible witness. I accept the father's evidence as reliable and accurate with respect to his memory of the content of this very disturbing conversation with Dr. Orsini.

203 Unfortunately, Dr. Orsini is not available to testify about what he said and why. Whether this hearsay evidence of Dr. Orsini is to be admissible for its truth was a matter of dispute.

204 I conclude that the conversation is not admissible for its truth. The content of the conversation is very prejudicial, and goes to the heart of this lawsuit. Its prejudice outweighs any probative value. The evidence does not meet the test of necessity. It is admissible only as part of the *res gestae* to provide context for this lawsuit, as it was said immediately following the surgery as a spontaneous utterance.

This Lawsuit

205 The plaintiff initiated this lawsuit on October 31, 2006 alleging negligence against the defendant, Scarborough General Hospital, and others.

206 The parties have agreed on damages. Dr. Richards in his uncontested evidence confirmed the effect of the development of compartment syndrome with respect to damages. It is not disputed that the plaintiff is left with

significant sequela. His range of motion in his right wrist is about half of his left, normal wrist. His elbow is stiff and pronation is limited. He has difficulties with his occupational activities, endurance, and simple daily living activities, such as brushing his teeth or opening a door. The plaintiff has extensive scarring from the compartment syndrome, including a 27 cm scar on the volar forearm and a 23 cm dorsal scar on the back of his arm. He was required to have plastic surgery and skin grafts to close the gap in his arm, by removing skin from his leg.

207 The only outstanding issue in this lawsuit is the liability of the defendant, Dr. Getahun.

Factual Issues

The defence submissions on the facts

208 Defence counsel submitted a version of the facts during their argument that in my view did not fairly reflect the evidence as it emerged, but that supports the defendant's theory of liability. These factual issues need to be clarified before reviewing the expert opinions.

209 First, counsel suggested that the plaintiff may not have required surgery after the cast was applied, relevant to Dr. Athwal's opinion on the standard of care.

210 Second, counsel suggested that the compartment syndrome may have developed after the cast was removed, not before, relevant to the question of causation. Counsel appears to rely on the triage nurse's evidence to support this theory. No expert confirmed this theory.

Surgery was required

211 I find as a fact that the plaintiff had to have open reduction surgery with external fixation to remove the rotated and significantly displaced lunate facet bone fragment out of the right wrist joint. The X-ray report at North York General confirms that the distal fragment of the lunate facet was "markedly displaced and rotated" and that it appeared to be rotated 180 degrees.

212 Both Dr. Taylor and Dr. Richards confirmed that external fixation surgery was required. Dr. Taylor confirmed that the displaced lunate facet was intra-articular, that there was ligament damage evident. Dr. Taylor confirmed that the plaintiff needed external fixation surgery "with or without" the closed reduction.

213 The defendant in his evidence and notes did not dispute that surgery was necessary because the reduction was only partially successful. The issue was who would perform the surgery, not whether the surgery was to take place.

214 Dr. Orsini describes the surgery that he performed with respect to the displaced lunate facet.

215 Dr. Athwal testified that the plaintiff may choose to live with the deformity rather than undergo external fixation surgery. This understanding underpinned Dr. Athwal's opinion that it was not necessary to bivalve the cast pending surgery. I find that the evidence did not support Dr. Athwal's understanding that surgery was not required.

216 Whether or not the bone graft recommended by the defendant was going to take place was in question. I find the bone graft was the focus of the plaintiff's concern, and the focus of the request for the second opinion.

217 None of the experts confirmed the defendant's recommendation of the possible bone graft. Dr. Taylor was clear in his evidence that he recently reviewed the clear versions of the X-rays and made the correct diagnosis. Based upon his review of the X-rays, he testified that a bone graft was not required. Dr. Orsini told both the plaintiff and his father that a bone graft was treatment that would be considered only at a later point in time. Neither Dr. Richards nor Dr. Athwal commented on the appropriateness of the recommended bone graft.

218 I conclude that the evidence clearly establishes that the plaintiff needed external fixation surgery to deal with the lunate facet bone fragment that was located in the joint. It was an open question whether or not he needed a bone graft.

Compartment syndrome started to develop after the cast was applied and became irreversible before the cast was removed

219 The defence counsel suggested that the facts support a finding that the compartment syndrome developed after, not before, Dr. Tanzer removed the cast shortly after 1:44 p.m.

220 This assertion advances the defence position on causation. The defence wished to rely on the triage nurse's assessment of the situation. She had no memory of the case, but noted in her triage notes that that the plaintiff between 11:55 a.m. to 12:03 p.m. was in "no acute distress" and "no obvious discomfort." Therefore, the defence counsel argues that the plaintiff did not have compartment syndrome when the triage nurse assessed him.

221 The evidence does not support this theory about the timing of the development of the compartment syndrome. Neither defence expert suggested or confirmed this theory. No expert suggested that the diagnosis of compartment syndrome was not made until shortly before the surgery. To the contrary.

222 Dr. Richards' opinion is that the cast caused the development of the compartment syndrome, and that the compartment syndrome became irreversible before the cast was removed. Dr. Richards explicitly testified that the compartment syndrome began before the cast was removed. He stated that removing the cast "takes off the external pressure, which may or may not be enough, because in Mr. Moore's case, if that's what we're talking about, he has already developed a compartment syndrome."

223 Based on the plaintiff's symptoms, Dr. Athwal was critical of Dr. Tanzer for not immediately splitting the cast and waiting for X-rays. Implicit in this criticism is his view that the compartment syndrome had developed before the cast was removed and that the cast should have been removed immediately.

224 Dr. Taylor was asked about when in his view the compartment syndrome was developing. Plaintiff's counsel objected as this evidence was not contained in Dr. Taylor's report. I allowed the questioning. Dr. Taylor's evidence was that the compartment syndrome could have been developing at 7:30 a.m. when the plaintiff awoke, or it could have developed after the cast was removed.

225 His evidence at the trial did not conform with his opinion in his report. Notwithstanding the submissions of plaintiff's counsel that this evidence was not in Dr. Taylor's report, in fact the issue of when the compartment syndrome developed is contained in Dr. Taylor's report dated September 9, 2013. Dr. Taylor confirmed that "Mr. Moore began to develop compartment syndrome symptoms early in the morning of 13 November 2005; at about 07:30." The emergency operation commenced at 18:35 and "therefore, the ischemic process had gone on for an estimated 11 hours."

226 In his report summary, Dr. Taylor writes, "a compartment syndrome developed several hours after the initial accident." This statement indicates that perhaps the compartment syndrome began before the plaintiff awoke on November 13, 2005.

227 Dr. Taylor's report is available to me as an aide only. I do not accept Dr. Taylor's suggestion in his *viva voce* evidence that the compartment syndrome may have developed after the cast was removed. This suggestion is contradicted by the contents of his report.

228 Any suggestion that compartment syndrome developed after the cast was removed was a new theory of defence counsel that does not accord with the facts or the evidence.

229 For the reasons fully outlined in the findings of fact, I accept the plaintiff's evidence as to his symptoms confirming the presence of compartment syndrome by the time he was at North York General Hospital and probably well before, when he awoke on November 13, 2005. When he awoke the plaintiff was experiencing excessive, disproportionate pain and increased swelling - both cardinal symptoms of a developing compartment syndrome.

230 The only reasonable inference on the evidence is that the compartment syndrome had been developing well before the cast was removed. Unfortunately, the triage nurse missed the diagnosis. I accept Dr. Tanzer's evidence that she missed the diagnosis and improperly triaged the plaintiff as a non-urgent case.

231 Dr. Tanzer testified that the triage nurse's misdiagnosis had no effect, as the plaintiff continued to complain to nurses and ultimately to a person in a white jumpsuit (probably a cast technician), who intervened on the plaintiff's behalf. Dr. Tanzer confirmed that he saw the plaintiff quickly and out of turn.

232 I also accept Dr. Tanzer's evidence as to his diagnosis of compartment syndrome. I find that Dr. Tanzer correctly made the immediate working diagnosis of compartment syndrome when he first saw the plaintiff at 1:15 p.m. His diagnosis was confirmed shortly after he reviewed the X-rays at 1:44 p.m. and he then had the cast technician split the cast.

233 When the cast being split did not abate the symptoms of pain and swelling, Dr. Tanzer soon communicated to Dr. Orsini that "we had a compartment syndrome."

234 I use common sense to infer that the removal of the cast had some ameliorating effect on the blood supply to the hand. The plaintiff's bluish green hand colour (as it was before the cast was removed) returned to its more normal pink colour as Dr. Orsini observed (as reflected in his notes). Unfortunately, there is a point in the development of compartment syndrome where the process cannot be reversed. At that point, the only treatment available is a fasciotomy to reduce the pressure in the compartments.

235 Dr. Taylor testified that, at 2:00 p.m. on November 13, 2005 shortly after the cast was removed, "what you're left with is that the compartment syndrome has progressed to the point where it requires surgical treatment. It's ... a true compartment syndrome, you have the self-perpetuating escalating process that goes on and it can only be stopped by surgical treatment and incising the fascia and reducing the pressure by increasing the volume of the muscles." I accept this evidence. Development of compartment syndrome is a process. Once it becomes irreversible, if there is no surgical intervention, the result would be muscle necrosis and muscle death eventually leading in the worst case scenario to an amputation.

236 Dr. Orsini saw the plaintiff between about 2:00 p.m. and 3:00 p.m. on November 13, 2005 presumably after finishing his other surgery. I accept the plaintiff's evidence that Dr. Orsini immediately confirmed in the initial meeting with the plaintiff that he would need surgery for compartment syndrome.

237 I find that the compartment syndrome started to develop after the cast had been applied and became irreversible by the time the cast was removed. Due to the continued pain and swelling after the cast was removed, it was clear that the development of the compartment syndrome had by that time become established, significant, and irreversible.

238 Removal of the cast had some ameliorating effect on blood flow, but the process was established and continuous. By the time it was removed, the damage caused by the cast had already been done. A fasciotomy was the only treatment available by the time the cast was removed.

239 Dr. Orsini did not begin the surgery on the plaintiff until 6:35 p.m. Dr. Richards opined that by that time there was muscle damage, but not muscle death. There is no evidence before me as to the reason for the delay for the surgery. It was a Sunday in an emergency department. Dr. Tanzer confirmed that, once he made the urgent referral to the orthopedic surgeon, the timing of the surgery was out of his hands.

240 I conclude that the evidence is clear that the compartment syndrome began after the cast was applied; it was established and irreversible by the time the cast was removed. There was some delay between Dr. Orsini's initial visit and the time the surgery started. There is no credible factual evidence or expert opinion supporting defence counsel's argument that the compartment syndrome developed after the cast was removed.

The Chronology of Experts retained by the Parties

241 I outline the sequence of experts retained by the parties to put the expert evidence into context.

242 The plaintiff retained Dr. Emil Orsini, the treating orthopedic surgeon, to give an opinion as to standard of care and causation. Dr. Orsini provided his first report dated July 27, 2006, prior to this lawsuit being commenced. In Dr. Orsini's opinion, the defendant had not met the applicable standard of care. The cause of the compartment syndrome was applying the closed circumferential cast that did not allow for swelling in this young man's high impact injury.

243 Dr. Orsini died on October 3, 2008. I admitted the factual aspects of his report for their truth as he was the treating physician, and the factual aspects simply supplement the admissible medical records. As previously outlined, Dr. Orsini's opinions on liability have been admitted only as part of the *res gestae* in shaping this lawsuit, but not for their truth.

244 The defendant retained Dr. Ronald Taylor, an orthopedic surgeon from Orillia, to testify and respond to Dr. Orsini's opinions on negligence and causation. Dr. Taylor wrote a report dated February 10, 2009 refuting Dr. Orsini's conclusions.

245 The plaintiff retained Dr. Robin Richards in March 2009 to initially testify on the issue of damages caused by the compartment syndrome. The defence does not dispute the contents of that report as the parties have agreed on damages. After Dr. Orsini's death, the plaintiff retained Dr. Richards to give his opinion on the two issues of liability, standard of care and causation, as well as damages. Dr. Richards provided a report dated September 8, 2009. He agreed with Dr. Orsini's opinions. Dr. Richards provided a further report dated September 16, 2013 confirming the plaintiff's position with respect to the standard of care and causation.

246 The defendant retained Dr. George Athwal in July 2013. He filed a report dated September 16, 2013 shortly before the commencement of trial in October 2013. His report confirmed the defence position with respect to standard of care and causation.

247 Dr. Richards prepared a final report dated October 4, 2013 disagreeing with Dr. Athwal's opinions.

248 Dr. Regan, the brother of plaintiff's counsel and an orthopedic surgeon in Vancouver, was retained at some point. He prepared a report that was served just before trial but was not before me. Dr. Athwal's second report commenting on Dr. Regan's report was not filed.

249 At trial, Dr. Richards testified as the expert witness on behalf of the plaintiff. Dr. Taylor and Dr. Athwal testified as expert witnesses on behalf of the defendant.

The Qualifications of the Experts and Findings of Credibility

Legal principles

250 In *R. v. Abbey*, [2009 ONCA 624](#), [97 O.R. \(3d\) 330](#), at para. 75, the Court of Appeal provides the four criteria for the admissibility of expert opinion evidence: (i) a properly qualified expert, (ii) absence of any exclusionary rule, (iii) relevance, and (iv) necessity in assisting the trier of fact.

251 Counsel have conceded that each expert is qualified to testify as an expert witness as to the standard of care of a reasonable and prudent medical practitioner with the same training and experience as the defendant in 2005 in a community hospital, as well as to the issue of causation applying the test in *R. v. Mohan*, [\[1994\] 2 S.C.R. 9](#).

252 Expertise is a "modest status that is achieved when the expert possesses special knowledge and experience going beyond that of the trier of fact": David M. Paciocco & Lee Stuesser, eds., *The Law of Evidence*, 5th ed. (Toronto: Irwin Law, 2010) at 203.

253 *Dulong v. Merrill Lynch Canada Inc.* [\(2006\), 80 O.R. \(3d\) 378](#) (S.C.), at para. 21 provided a list of factors that judges regularly consider in determining if an expert is properly qualified. These factors are relevant to determining an expert witness' threshold reliability:

- * The proposed expert's professional qualifications
- * Actual experience
- * Participation or membership in professional associations
- * The nature and extent of his or her publications
- * Involvement in teaching
- * Involvement in courses or conferences in the field and his or her efforts to keep current with the literature
- * Whether the expert has previously been qualified as an expert in the area

254 After determining that expert evidence is admissible, the next step in assessing expert evidence is to consider the credibility and quality of the expert report and oral evidence. As counsel conceded the three experts' threshold reliability, I did not rule on whether each expert was qualified to testify. However, the above noted list was useful in weighing each expert's comparative reliability and credibility.

255 In addition, the following questions may be useful in assessing the expert witnesses' comparative reliability and credibility:

- * Is the witness fair and impartial in the report presented and in the evidence given?
- * Is the expert's report and oral evidence consistent?
- * Is the expert's opinion clearly set out in the report, including the facts and documents underpinning the opinion?
- * Do the conclusions logically flow from the facts?
- * Are alternative theories canvassed?
- * Does the expert make concessions in the report where appropriate that may not be helpful to the party who retains him or her?
- * Are the facts relied upon by the expert confirmed in the evidence at trial?
- * Does the expert make reasonable concessions in his or her *viva voce* evidence if the facts are not as he or she assumed them to be?
- * Does the witness provide balanced evidence that is neutral, or is he or she dogmatic and fixed in his or her opinion?
- * Does it appear that the witness aligned with one party's position, assuming the role of an advocate, rather than act as a neutral witness with a duty to the court?

* Is there an appearance of bias, or is there evidence of actual bias?³

256 I am guided by these principles when assessing the expert evidence in this case.

The defence position limiting the scope of the expert evidence

257 As I outlined in paragraphs 59 to 70, I do not accept the defence counsel's approach as the proper or intended interpretation of Rule 53.03 of the *Rules of Civil Procedure*. However, in light of plaintiff counsel's concession, Dr. Richards' answers in chief were largely limited to the content of his reports. He was not permitted in chief to comment on trial evidence, or any issues arising from the evidence, unless they were referred to in his reports.

258 I note that defence counsel did not follow the same set of strict rules when questioning the defence experts. I allowed the expanded questioning of the defence experts, notwithstanding the defence counsel's approach limiting Dr. Richards' evidence.

Dr. Richards: qualifications, credibility, and reliability

259 Dr. Richards testified for the plaintiff. He opined that the defendant did not meet the standard of care when he applied a closed circumferential cast in the facts of this case. Dr. Richards personally would use, and teaches others to use, a splint to allow for swelling in high impact injuries. He opined that in the facts of this case a bivalved cast cut to the skin would also meet the standard of care. Dr. Richards also gave the opinion that, on a balance of probabilities, the underlying injury combined with the application of a closed circumferential cast caused the compartment syndrome to develop in this case.

260 Dr. Richards qualified as an orthopedic surgeon in 1982, completing his fellowship at the University of Toronto. His lengthy *curriculum vitae* confirms that Dr. Richards is a recognized expert in upper extremity orthopedic surgery. He was the Surgeon in Chief at Sunnybrook Health Sciences Centre from 2001 to 2012 and is now Surgeon in Chief Emeritus. From 1989 to 2000, he was the head Medical Director of the Mobility Program at St. Michael's Hospital in Toronto. In 2005, the date of this incident, he had been a full-time practicing orthopedic surgeon for years and had been promoted to senior positions in these two hospitals. Sunnybrook has a network of community hospitals, for which he assumed responsibility.

261 Dr. Richards has been appointed a professor in the faculty of medicine at the University of Toronto since 1984. He annually teaches the entire second and fourth-year medical class at the University of Toronto Medical School in their orthopedic education blocks on treatment and fracture care, as well as the importance of patient care and treatment when compartment syndrome may become an issue.

262 In addition, since 1984 Dr. Richards has taught medical students, residents in orthopedic surgery, and fellows in the hospital settings at Sunnybrook Hospital and St. Michael's Hospital.

263 His *curriculum vitae* outlines his many awards for teaching as well as his many publications. He has written extensively and lectured nationally and internationally based on his years of experience as an orthopedic surgeon, not as a researcher or scientist.

264 One publication is of particular note: Robin Richards, "Fractures of the shafts of the radius and ulna" in Robert W. Bucholz & James D. Heckman, eds., *Rockwood and Green's Fractures in Adults*, 5th ed. (Philadelphia: Lippincott Williams & Wilkins, 2001).

265 As an example of his recognized expertise in the field, the University of Western Ontario and McMaster University retained Dr. Richards to conduct an external review of orthopedic standards in the department of surgery at all the different hospital settings in London and Hamilton, Ontario.

266 Dr. Richards has been qualified as an expert witness on many occasions: see e.g. *Shepstone v. Cook*, [2013](#)

[ONSC 418](#), [\[2013\] O.J. No. 802](#); *Sabourin v. Dominion of Canada General Insurance Co.*, [\[2009\] O.J. No. 1425](#), [2009 CarswellOnt 1880](#) (S.C.); *McGregor v. Crossland* (1999), [66 A.C.W.S. \(3d\) 368](#) (Ont. Gen. Div.); *Robinson v. Sisters of St. Joseph of the Diocese of Peterborough in Ontario* (1997), [69 A.C.W.S. \(3d\) 559](#) (Ont. Ct. J. (Gen. Div.)), *aff'd* (1999), [117 O.A.C. 331](#) (Ont. C.A.); *Guy v. Grosfield*, [\[1994\] O.J. No. 1965](#) (Gen. Div.); and *Khoshmashrab v. Bent*, [\[2004\] O.J. No. 1830](#) (S.C.).

267 It is clear based upon his wealth of practical experience, teaching, publications, and lectures that Dr. Richards is qualified to provide expert evidence on the standard of care and causation in this case.

268 Dr. Richards met with and examined the plaintiff as part of his initial retainer to assess damages. He was then retained to provide expert opinion on liability. He reviewed the medical records and X-ray radiology reports before writing his reports. He wrote several reports beginning March 23, 2009 after meeting with the plaintiff and examining him. The first report deals primarily with damages, which is not contested.

269 The defence counsel challenged Dr. Richards' ability to render an opinion in this case as he did not read the transcript of discovery of the plaintiff or the defendant. His review of the facts was limited to a review of the medical brief, the examination of the plaintiff, discussions with the plaintiff, and the various medical reports received from counsel.

270 In my view, Dr. Richards had ample material upon which to base his opinion. I make no negative finding about not reading the examinations for discovery. Dr. Richards had the benefit of examining and speaking with the plaintiff directly. The defendant did not remember specifics of this incident. He relied almost entirely on his notes, which Dr. Richards reviewed. The questions in this lawsuit do not require a review of the defendant's transcript as there is no dispute that he applied a full circumferential cast after the closed reduction, when there remained a significant displacement of the lunate facet and surgical intervention was required. Dr. Richards reviewed all of the hospital records.

271 Defence counsel challenged Dr. Richards' qualifications as he did not outline all of the literature that he relied upon in reaching his conclusions, compared to Dr. Athwal's report, which cites several articles and textbooks. Dr. Richards attached an excerpt from a Google search in support of his opinion on causation, which the defence suggests should undermine his academic credibility.

272 Dr. Richards' *curriculum vitae* is lengthy and learned. He has published and lectured widely. I accept that he did not believe that it was necessary to refer to specific textbooks in his report. In his view, the contents of his testimony are known and common sense. He attached the Google search of compartment syndrome not to replace professional literature, but to illustrate that it is a known fact readily available to the public that a tight cast can cause compartment syndrome.

273 Dr. Richards referred to some extracts from standard textbooks in support of his evidence at the trial, despite defence counsel's objection. This was appropriate and properly admissible, even though his report did not specifically refer to these textbooks. Dr. Richards testified based upon years of personal experience and teaching, not based upon a literature review.

274 Dr. Richards was unequivocal about his teaching that the application of a full circumferential cast in high impact injuries such as this case is not appropriate. This is the clear message that he has taught to the students, residents, and fellows over the years.

275 Dr. Richards gave his evidence in a clear and straightforward manner. He was no nonsense in his approach. He was not defensive or rigid in his responses in cross-examination, but he was not to be pushed around by counsel. Although he did not teach or recommend using a cast for acute distal radius fractures, he conceded both in his reports and in his evidence that a bivalved cast was acceptable alternate treatment that met the standard of care in 2005 in Ontario. He was fair and balanced in the answers he gave, and was neutral in his approach.

Dr. Taylor: qualifications, credibility, and reliability

276 Dr. Taylor testified on behalf of the defence. Dr. Taylor wrote two reports dated February 10, 2009 and September 9, 2013. He testified that the defendant's treatment met the standard of care in applying a closed circumferential cast to the plaintiff's injury. Further, Dr. Taylor testified that the cause of the compartment syndrome was the underlying injury, and not the closed circumferential cast. He acknowledged that the closed circumferential cast could aggravate the development of compartment syndrome caused by the underlying injury.

277 Dr. Taylor obtained his medical degree at Queen's University in 1968. He did a one-year internship at St. Michael's Hospital in Toronto. To qualify as an orthopedic surgeon at Queen's University, students had the option to do a four-year residency or do one year of research, which would result in a master's of science, followed by a three-year residency. Dr. Taylor opted for the research. He received his Masters of Science for his study of tendon length and muscle strength. He then completed his residency at Queen's University to qualify as an orthopedic surgeon in 1974.

278 Dr. Taylor worked his entire professional career for 37 years as the sole orthopedic surgeon in Orillia at the Soldiers Memorial Hospital from 1975 to 2011, when he retired. He is a member of the usual Canadian orthopedic associations. There is no "house staff" at Soldiers Memorial Hospital - no interns, residents, or fellows. There are some interns in family medicine, who want experience in a community hospital where family doctors perform a role in an emergency setting. Dr. Taylor has played a teaching role with this group of family practitioners.

279 Dr. Taylor has not lectured or written any papers during his long career as an orthopedic surgeon. In his words, it was not in his nature to write papers or do research. He reads journals and attends the orthopedic associations' annual meetings, lectures, and workshops to keep informed. Dr. Taylor claimed that "university people" look outward to international associations. He was a local orthopedic surgeon who looked inward to respond to his community's needs.

280 From 1975 to 2001, Dr. Taylor dealt with most of the distal radial or ankle fractures that came to the hospital, although the general surgeons had some involvement. Dr. Taylor was frequently involved with distal radial fractures - approximately three to four times per week. From 2001 to 2011, emergency room physicians primarily cared for distal radial fractures including reduction, casting, or splinting. If the emergency room physician was unable to successfully reduce the fracture, they would call Dr. Taylor.

281 Dr. Taylor acknowledged that he was infrequently involved in emergency treatment of distal radial fractures after 2001, and up to 2005 when this incident occurred, as the emergency room physicians "did a very good job." Dr. Taylor provided follow-up care for these patients at his fracture clinic.

282 Dr. Taylor has been qualified as an expert witness on three previous occasions, testifying on each of those occasions for the defence.

283 Dr. Taylor has seen 12 cases of compartment syndrome in the lower limb, all before any cast was applied. Dr. Taylor has never in his 37 years of practice seen compartment syndrome in the volar forearm, such as the plaintiff's injury. He has seen only one case of upper extremity compartment syndrome. In that case, the cast was split and, based upon the pressure measurements taken, surgery was not necessary after the cast had been removed. Evidently in that case, the developing compartment syndrome had not become irreversible. The symptoms abated after the cast was removed.

284 Dr. Taylor acknowledged in cross-examination that to prepare his reports he read about compartment syndrome to refresh his memory and confirm his reports were correct.

285 Dr. Taylor is of the old school. He is obviously a very competent general orthopedic surgeon. He has vast experience in one setting, and has served his community well for many years. However, his knowledge of

procedures across Ontario is limited to his practical experience in one setting in Orillia, as well as what he has learned in annual meetings and journals.

286 From 2001 to 2005 in Orillia, emergency room physicians performed the primary care for acute distal radius fractures. Dr. Taylor would do the follow-up care in his fracture clinic. Aspects of his evidence were fair and neutral. He conceded to the increasing use of splints to accommodate swelling and for ease of application and removal. On safe, non-contentious ground, Dr. Taylor provided helpful background to the court based on his years of practical experience.

287 Dr. Taylor was placed in a very awkward situation with respect to the contents of his second report. When plaintiff's counsel reviewed his file, counsel found various draft reports as well as notes of a one-and-a-half-hour telephone conference call between Dr. Taylor and defence counsel reviewing his draft report.

288 Dr. Taylor was obviously totally unaware that it may be improper to discuss and change a draft report, as a breach of his duty of impartiality. Counsel were responsible for this situation.

289 On October 23, 2013, when questioned about the notes of the telephone conversation, Dr. Taylor testified that his final draft report dated August 27, 2013 was sent to Lerner once he was happy with it. Lerner then made "suggestions ... of what to put in" his report. He adjusted his report to include "the corrections over the phone."

290 The trial evidence on the changes made to the draft report continued the next trial day, after defence counsel had the opportunity to analyze the changes.

291 I note that there was quite a dramatic difference in the tone and demeanor of Dr. Taylor's evidence given on October 23, 2013 and his evidence the next morning, which may not be evident by simply reading a transcript.

292 On October 24, 2013, Dr. Taylor stated that the changes were slight differences, such as headings and punctuation. There were no changes to his opinion. He was carefully questioned and he confirmed that the insertions were all his idea. They were not (as he had agreed the day before) "suggestions made by the lawyers of what to put in" his report. Dr. Taylor became noticeably flustered during this aspect of his evidence. He minimized all changes.

293 I conclude that the meeting between defence counsel and Dr. Taylor involved more than simply superficial, cosmetic changes. The conversation took place over a period of one and a half hours. Some content helpful to the plaintiff in the August 27, 2013 draft report was deleted or modified. I find that Dr. Taylor's opinion, although not changed, was certainly shaped by defence counsel's suggestions.

294 The defence relied on *Flinn* to argue that it is appropriate for counsel to review draft expert reports. In *Flinn*, plaintiff's counsel received a preliminary expert report and returned it to the expert with his comments. In response to those comments, the expert prepared a revised report. The plaintiff's counsel refused to disclose the preliminary report or the lawyer's comments, claiming they were privileged and involved discussions of "tactics and strategy": at para. 25. The Nova Scotia Supreme Court reiterated the independence of experts' opinions and ordered disclosure of the lawyer's comments.

295 In my view, *Flinn* does not assist the defendant for two reasons.

296 First, the Nova Scotia Supreme Court did not endorse counsel's reviews of the preliminary expert report. Rather, the court expressed concern about "the propriety of discussing with such an independent expert questions of 'tactics and strategy'": *Flinn*, at para. 29. The court ruled that the defendants were entitled to determine whether the plaintiff's lawyer had influenced the expert's opinion, as this would affect the weight of the opinion.

297 Second, I note that this decision dates from 2002. At that time, the Nova Scotia *Civil Procedure Rules* contained less strict requirements for the independence of expert evidence than the current Rule 53.03 of the

Ontario *Rules of Civil Procedure*. The 2010 amendments to the Ontario rules were to address the hired "gun approach" to expert evidence, and to emphasize the importance of expert witness independence and integrity.

298 The practice formerly may have been for counsel to meet with experts to review and shape expert reports and opinions. However, I conclude that the changes in Rule 53.03 preclude such a meeting to avoid perceptions of bias or actual bias. Such a practice puts counsel in a position of conflict as a potential witness, and undermines the independence of the expert.

299 If counsel seeks clarification or amplification after receipt of an expert's final report, all communication should be in writing, and any communication should be disclosed to the opposing party.

300 In my view, Dr. Taylor's change in tone confirms that he viewed his obligations as being to the defence, and not to the court. His attitude change and obvious alignment affects his credibility.

301 I note as well in assessing the weight of his evidence that Dr. Taylor's experience is limited to one clinical setting over many years. His experience with compartment syndrome in the upper extremity is one case that did not require a fasciotomy. As well, the absence of teaching or publications in the field also affects the weight to be attributed to his evidence.

302 To his credit, I note in the September 16, 2013 report that Dr. Taylor acknowledges that the presence of a cast may be an aggravating factor in the development of compartment syndrome.

Dr. Athwal: qualifications, credibility, and reliability

303 Dr. Athwal testified as an expert witness for the defence.

304 He prepared two reports: one dated September 16, 2013 and one prepared October 11, 2013. The second report dated October 11, 2013 was withdrawn as it commented on Dr. Regan's report and Dr. Regan did not testify.

305 Dr. Athwal testified that the application of a full circumferential cast after the closed reduction with a hematoma block was appropriate. It followed the practice and the teaching at his hospital. He also opined that the full circumferential cast did not cause the plaintiff's compartment syndrome. The underlying injury caused the compartment syndrome.

306 Dr. Athwal obtained his medical degree from the University of British Columbia in 1998. He qualified as an orthopedic surgeon in June 2003, two and a half years before the incident before the court. He completed a one-year fellowship at Cornell University in hand and elbow surgery in 2004. He completed another fellowship at the Mayo Clinic in shoulder and elbow surgery in 2005.

307 Dr. Athwal received his first full-time job as an orthopedic surgeon in August 2005, four months before the plaintiff's accident. Western University hired him as an associate professor in the department of surgery, and a consultant in the Hand and Upper Limb Center in London, Ontario. Since 2005, Dr. Athwal has had no experience as an orthopedic surgeon in a community hospital, although he completed his residency as an orthopedic surgeon at a community hospital in Kingston, Ontario.

308 Dr. Athwal was qualified as an expert on orthopedic surgery for the diagnosis, care, and treatment of acute distal radial fractures and on compartment syndrome in November 2005, without objection from plaintiff's counsel. This is the first time that Dr. Athwal has qualified as an expert witness in any trial.

309 In November 2005, at the time of the accident, Dr. Athwal had been working as an orthopedic surgeon, teacher, and scientist for four months. He has obviously accumulated experience since that time. However, his relative lack of experience is a factor for me to take into account in assessing his evidence about liability in 2005.

310 Since August 2005, he has taught medical students, residents, and fellowship students.

311 Based upon his evidence, Dr. Athwal works as an orthopedic surgeon about four to five days per month in a clinic, he is on call once a week, and he is on call for a further three days every five to six weeks. The rest of the time, he is teaching or conducting research. He acknowledged that he may be characterized as an academic. His lengthy *curriculum vitae* and his relatively modest number of years in practice confirm that Dr. Athwal spends a great deal of time teaching, researching, writing, and lecturing.

312 Dr. Athwal testified that he feels very comfortable managing compartment syndrome including its diagnosis and surgical treatment. In his practice, Dr. Athwal testified that he diagnoses compartment syndrome once a year or once every 18 months. As he has been an orthopedic surgeon since 2003, I estimate based on his evidence that by 2005 he had one or two cases involving compartment syndrome; to date he has perhaps made the diagnosis about 7 to 10 times. He confirmed that compartment syndrome is one of the most serious upper extremity injuries.

313 Dr. Athwal characterizes himself as a specialized surgeon consultant and a scientist. Dr. Athwal is clearly very intelligent and accomplished, and his *curriculum vitae* confirms that he is primarily an academic, a scientist, and a teacher. He has not worked in the trenches in a community hospital except during his residency.

314 The plaintiff's counsel suggested in argument that Dr. Athwal was an advocate for the defence. I agree with this submission. I found Dr. Athwal's approach in this lawsuit to be one-sided and not neutral. He appeared to use facts selectively to support the defence's position.

315 Dr. Athwal's report confirmed that in his view the application of a full circumferential cast was appropriate. However, his report did not explain that the application of a full circumferential cast is merely the first step after a closed reduction, before assessing treatment options. His written report was incomplete and hence in my view misleading.

316 In his evidence, Dr. Athwal steadfastly maintained his view that a full circumferential cast was appropriate in this case. This opinion was founded on two important misapprehensions of the evidence.

317 First, Dr. Athwal misunderstood the plaintiff's symptoms on November 12, 2005 after the cast was applied. He testified that he understood that the plaintiff was "comfortable." This was not the evidence.

318 Second, Dr. Athwal misunderstood that, after the cast had been applied, the surgery may not take place. Dr. Athwal erroneously drew the inference that the plaintiff contemplated living with a deformity rather than undergoing surgery. His evidence conflicts with the evidence of the other two experts, the defendant, and the plaintiff.

319 When it became clear during Dr. Athwal's evidence that surgery was required and he confirmed he would have bivalved the cast prior to the surgery, he adapted his theory on the appropriate standard of care. He introduced a new theory in favour of the defence that was not canvassed in his report. He testified that, because other community orthopedic surgeons refer other patients to him for surgery and those pre-surgery patients have full casts, the standard of care has been met in this case. As this new theory was not contained in his report, therefore Dr. Richards did not comment upon it.

320 For reasons that I will outline, I find that the reasonableness of this suggestion to establish the standard of care is questionable.

321 Dr. Athwal has never been qualified as an expert witness before this case. It was clear on the issue of causation that Dr. Athwal did not understand the difference between scientific causation and the legal test for causation.

322 Dr. Athwal did testify that the application of a full circumferential cast, combined with the underlying injury, can

exacerbate the development of compartment syndrome, and could cause the symptoms to develop more quickly. This important acknowledgement was not contained in his report.

323 Dr. Athwal is a teacher. However, he did not give evidence about what he teaches students would be appropriate treatment in the facts of this case (a high impact injury of a young man with a partially successful reduction where surgery was contemplated). In my view, this is a serious omission in light of his role as a teacher.

324 For the reasons I have outlined, I approach Dr. Athwal's evidence with significant caution. I find that Dr. Athwal in 2005 had limited practical experience of community standards of care in Ontario. I had the impression during Dr. Athwal's testimony that he was sparring with counsel. He was concerned about providing answers to help the defence, as opposed to providing evidence as a neutral witness to assist the search for truth.

Conclusions on weighing the experts' opinions

325 The plaintiff's expert and the defendant's experts offer different opinions on important issues. Where there are differing opinions, I prefer Dr. Richards' evidence. I reach this conclusion based on his years of experience as an upper extremity orthopedic surgeon, his extensive history of teaching and lecturing, his numerous publications, and his vast experience in Ontario and internationally as a leading surgeon in his field. In assessing Dr. Richards' credibility, I emphasize the importance of his independence and neutrality. He is abrupt and no nonsense in giving his evidence, but he makes concessions both in his written reports and in his evidence where appropriate. He provided a consistent, fair, unbiased opinion. As well, his evidence makes sense in light of the facts of this case and is consistent with the medical literature.

326 I have outlined what I see to be the comparative weaknesses in the defence experts' qualifications, as well as their neutrality problems.

Caselaw on the Standard of Care

327 The plaintiff bears the onus of proving on a balance of probabilities that a defendant breached the standard of care of a reasonable and prudent medical practitioner with the same training and experience, having regard to all the circumstances of the case. *Crits v. Sylvester*, [1956] O.R. 132 (C.A.), at para. 13, aff'd [1956] S.C.R. 991 provides the following on the standard of care:

Every medical practitioner must bring to his task a reasonable degree of skill and knowledge and must exercise a reasonable degree of care. He is bound to exercise that degree of care and skill which could reasonably be expected of a normal, prudent practitioner of the same experience and standing, and if he holds himself out as a specialist, a higher degree of skill is required of him than of one who does not profess to be so qualified by special training and ability. Every medical practitioner must bring to his task a reasonable degree of skill and knowledge and must exercise a reasonable degree of care. He is bound to exercise that degree of care and skill which could reasonably be expected of a normal, prudent practitioner of the same experience and standing, and if he holds himself out as a specialist, a higher degree of skill is required of him than of one who does not profess to be so qualified by special training and ability

328 In this case, the defendant in November 2005 was a qualified specialist as an orthopedic surgeon with emergency room privileges in Scarborough General Hospital in Toronto. Therefore, the plaintiff must prove on a balance of probabilities that the defendant breached the standard of care of a reasonable and prudent orthopedic surgeon in a community hospital practicing in Ontario in 2005.

329 In *Crawford (Litigation guardian of) v. Penney*, [2003] O.J. No. 89 (Ont. S.C.), Power J. states that the foreseeable risk of a certain treatment influences the standard of care. As the degree of risk involved for a specific treatment increases, "so rises the standard of care expected of the doctor. The principle was expressed succinctly in one case as follows: the 'degree of care required by the law is care commensurate with the potential danger'": *Crawford*, at para. 224.

330 At para. 230, Power J. confirms that the standard of care includes the duty to be competent and knowledgeable in the area of medicine practiced by the physician at the relevant time; the duty to make a diagnosis and advise the patient of that diagnosis; the duty to refer a patient to another physician in a timely fashion where the attending physician cannot make a diagnosis; and the duty to disclose to the patient the nature of the proposed treatment, all material risks, and alternatives.

331 In *Bafaro v. Dowd*, [2008 CanLII 45000](#) (Ont. S.C.), at paras. 24-43, aff'd [2010 ONCA 188](#), [260 O.A.C. 70](#) and *Morin v. Korkola*, [2011 ONSC 1393](#), [\[2011\] O.J. No. 1091](#), at para. 20, aff'd [2012 ONCA 869](#), [\[2012\] O.J. No. 5832](#), Carpenter-Gunn J. and Mulligan J. outline the legal principles to guide courts in considering the standard of care applicable to medical practitioners:

- * An unfortunate outcome does not constitute negligence. Physicians are obliged to provide certain means, not a certain result. Courts must not judge a physician's treatment by its result.
- * Physicians should not be held liable for mere errors in judgment, only professional faults. An error in judgment is distinct from acts of unskillfulness, carelessness, or lack of knowledge. An error in judgment is not negligence where the physician exercises clinical judgment. The law requires reasonable care, not perfection. Even reasonable doctors make mistakes.
- * Courts must not judge a physician's conduct with hindsight. Physicians are not liable for mistakes that are apparent only after the fact. Courts must assess a physician based on the knowledge that a physician ought to reasonably possess at the time of the alleged act of negligence.
- * Courts may give significant weight to a professional's invariable practice. If a person claims that he invariably performs a certain task in a certain way, this is evidence that he performed that task in that way on the day in question.
- * A physician should not be held liable for a treatment decision based on unreliable patient data when its unreliability was neither known to him nor discoverable by him upon reasonable inquiry at the critical time.
- * The trier of fact may determine that the standard of care itself is inherently negligent. The standard practice must be "'fraught with obvious risks' such that anyone is capable of finding it negligent, without the necessity of judging matters requiring diagnostic or clinical expertise": *ter Neuzen v. Korn*, [\[1995\] 3 S.C.R. 674](#), at para. 41.
- * Courts often require expert evidence in medical malpractice cases due to the specialized knowledge of the medical profession. Courts should use expert evidence when the issues to be decided involve diagnostic or clinical skills that are not within the trier of fact's ordinary knowledge and experience.

332 In *Bafaro* at paras. 32-38, Carpenter-Gunn J. provides specific principles to guide courts in considering expert evidence in medical malpractice cases:

- * Courts must be particular about accepting expert evidence in assessing the standard of care. Medical specialists should not opine on the standard of care of specialists in other areas: see e.g. *Alakoozi v. Hospital for Sick Children* ([2002](#)), [117 A.C.W.S. \(3d\) 828](#) (Ont. S.C.), aff'd [\(2002\) 187 O.A.C. 187](#) (C.A.).
- * Practice guidelines are not equivalent to the legal standard of care. Practice guidelines may be relevant to the court's assessment of the standard of care. However, they cannot determine the legal standard of care for a specific medical professional, especially when there is expert evidence on the standard of care with reference to the particular facts of the case.
- * An expert's personal practice is not the standard of care.

- * If there are different techniques available to treat the same medical condition, a physician may exercise his discretion to determine the best course of treatment for that particular patient. In *Lapointe v. Hôpital Le Gardeur*, [1992] 1 S.C.R. 351, at para. 31, L'Heureux-Dubé J. states that "a doctor will not be found liable if the diagnosis and treatment given to a patient correspond to those recognized by medical science at the time, even in the face of competing theories." In *Connell v. Tanner* (2002), 158 O.A.C. 268, at para. 1, Laskin J.A. writes, "a doctor who treats a patient in accordance with a respectable body of medical opinion - even if it is a minority opinion - will not normally be held liable in negligence."

333 Ultimately, the court determines the standard of care, not medical experts: *Tacknyk v. Lake of the Woods Clinic*, [1982] O.J. No. 170 (C.A.). Where there are conflicting expert opinions, the trier of fact must weigh the conflicting testimony: *Crawford*, at para. 248.

Review of Each Expert's Evidence on the Standard of Care

Dr. Richards' opinion on the standard of care

334 Dr. Richards gave the opinion in the facts of this case that the placement of a full circumferential cast on the plaintiff's fracture in this high impact injury was below the standard of care for an orthopedic surgeon in Ontario in November 2005. He testified that he prefers and has consistently taught students, residents, and fellows over the years since 1984 that, with a high impact injury of the distal radius, a splint with wrapping is the proper treatment to allow for anticipated swelling, and that a full circumferential cast on distal radius fractures is not appropriate.

335 Dr. Richards was unequivocal that, when teaching medical students, residents, and post-graduate fellows in the classroom or in the hospital, they must be very aware of the importance of compartment syndrome, including knowledge as to what it is, how to diagnose, treat, and prevent it, and the serious, disabling consequences.

336 Dr. Richards agreed that there may be a range of acceptable opinions about proper treatment that vary with teaching and clinical judgment. In his experience and opinion, he teaches that the splint is the proper treatment. He testified that a bivalved cast is also an acceptable treatment for a displaced acute distal radial fracture. Although Dr. Richards does not personally use or teach the use of a cast, "it's okay to use a cast if you bivalve the cast" in the plaintiff's circumstances. The cast must be bivalved. Dr. Richards stated, "It allows a limb to swell without causing a compartment syndrome." Dr. Richards was clear that the bivalved cast must be cut to the skin, through the soft web roll.

337 Dr. Richards testified that the ambit of this teaching overseen by the auspices of Sunnybrook Hospital include the community hospitals of Bayview Campus, the Wellesley Street Orthopedic Hospital, Women's College Hospital, and St. John's Rehabilitation Hospital.

338 As part of the prevention of compartment syndrome, Dr. Richards teaches all of his students in the classroom and at Sunnybrook Hospital, St. Michael's Hospital, and their associated hospitals that, after the reduction of a fracture in a high impact injury, a splint or a split circumferential cast should be applied, but never a full circumferential cast.

339 Dr. Richards testified that splinting, or bivalving or splitting the cast, meets the standard of care because it allows the anticipated swelling in a high impact injury to occur without increasing the pressure in the compartment. In contrast, a circular circumferential cast does not allow for swelling. Muscle swelling occurs within the constraints of the cast that can cause increased pressure in the forearm compartments, causing increased pressure within muscles and compromising nerves and blood vessels. Muscle necrosis can occur over time if the muscle is not receiving any oxygen, resulting in muscle death.

340 In his report dated April 16, 2012, Dr. Richards opined that the cast must be bivalved or very well-padded:

I have lectured to the University of Toronto medical school class annually since my appointment in 1984. The consistent teaching over these years is that any type of tight cast or constrictive dressing needs to be avoided in patients with acute injuries due to the risk of compartment syndrome developing. I have informed the students that in my practice I use splints with padding as opposed to circumferential casts initially (for the first one to three weeks) prior to applying the circumferential cast. If a circumferential cast is used initially it needs to be very well padded or bivalve to allow for swelling. [Emphasis added.]

341 I note that this is a description for treatment of any kind of acute injury. It does not refer to high impact injuries such as the plaintiff's injury. In any event, Dr. Richards during his testimony disassociated himself from this statement that a well-padded non-bivalved cast met the standard of care in this case. This single statement conflicts with all of Dr. Richards' evidence. Dr. Richards acknowledged the statement, but was obviously caught by surprise and initially denied making such a statement. Notwithstanding the one line in his report, he confirmed his view that the only acceptable treatment for the plaintiff was a splint or a bivalved cast cut to the skin.

342 I note Dr. Richards' report talks about "splints with padding," and then refers to a circumferential cast that must be "well padded or bivalved." Although Dr. Richards did not say so, it appears that the "or" should have been an "and." His evidence makes sense after making this adjustment for what appears to be a typo.

343 I note that no other expert suggested that padding in a full circumferential cast could accommodate swelling. Dr. Taylor specifically stated that the padding was to protect the skin from the effects of the plaster. He said that too much padding would prevent the cast from performing its function.

344 When commenting on the X-rays taken at North York General on November 13, 2005, Dr. Richards observed limited or non-existent padding next to the plaster cast. He observed that the arm had swollen so much within the strictures of the cast that any padding that may have been present was obliterated.

345 Dr. Richards clearly maintained his position that, if a circumferential cast is used to treat an acute wrist injury, the cast must be bivalved and the underlying padding must be cut. Dr. Richards gave the clear opinion that the care provided to Mr. Moore fell below the standard in the province.

346 I conclude that the degree of padding is not relevant to assessing the question of standard of care. The issue in this case is whether the application of a full circumferential cast was appropriate. It appears that there was an error in Dr. Richards' report; the "or" should have been an "and."

347 In his evidence, Dr. Richards commented on Exhibit 6b, which shows the X-rays taken at Scarborough General Hospital along with drawings. All of the experts and the defence accepted the drawings as accurate pictorial depictions of the injuries in the X-rays. Exhibits 6c and 6d show the acute initial injury before reduction and after reduction. Exhibit 6d confirms that, after reduction and casting, the distal radius was aligned but the lunate facet was still displaced. The lunate facet after the closed reduction was rotated 180 degrees.

348 The X-rays taken at North York General confirm essentially the same information with respect to the fracture. Dr. Richards confirmed that, due to the displaced lunate facet, it would be necessary to intervene to put the lunate bone back into place. In his view, surgery was clearly necessary. In these circumstances, Dr. Richards opined that the plaintiff should be treated with a splint or a bivalved cast.

349 The defendant's experts characterized compartment syndrome as rare. Dr. Richards disagreed and characterized compartment syndrome in acute distal radius fractures as uncommon.

350 Dr. Richards confirmed that the literature states that the incidence of compartment syndrome in tibial fractures of the leg in high impact injuries is 2.5%. He acknowledged that tibial fractures have a higher risk of compartment syndrome than distal radial fractures. Dr. Athwal's testimony confirmed that a review of one study suggests that compartment syndrome develops in 1.4% of cases of high impact distal radius fractures.

351 Dr. Richards testified that patients with a high impact injury should be educated and instructed on the signs of compartment syndrome.

352 Dr. Richards testified that the effects of compartment syndrome are known and can be devastating. Practitioners must be aware of the risks and take preventative measures to avoid compartment syndrome. Dr. Richards opined that it is unacceptable and below the standard of care to apply a circumferential cast that even marginally increases the risk of compartment syndrome.

353 In this case, Dr. Richards gave the opinion that the only treatment to meet the standard of care within the acceptable, established range of clinical judgment was a splint or a bivalved cast, split to the skin. It was his opinion that the application of the full circumferential cast fell below the standard of care.

Dr. Taylor's opinion on the standard of care

354 Dr. Taylor testified that in his opinion a well-applied full circumferential cast was appropriate after a closed reduction, to maintain the length and alignment of the successfully reduced fracture. If the fracture is well reduced, the cast best protects the bone fragments from shifting out of place. Dr. Taylor testified that the application of a full circumferential cast met the standard of care in 2005.

355 Dr. Taylor confirmed that the padding layer applied to the arm before the plaster "doesn't make all that much difference" to accommodate swelling. The purpose of the preliminary layer of soft padding is to protect the skin from the rigid plaster. Typically two to three rolls of soft material are applied prior to applying the plaster for a distal radial cast.

356 Dr. Taylor only recently received quality copies of the available X-rays. In Dr. Taylor's first report dated February 10, 2009, he confirmed that the plaintiff had a distal ulna fracture and a distal radius fracture. This was an error.

357 Dr. Taylor also confirmed in his first report that the plaintiff had a die punch fracture, for which a bone graft (as the defendant recommended) may be appropriate. After reading the better quality X-rays, he acknowledged that this was not a correct diagnosis. The plaintiff in fact had a rotated fracture of the lunate facet. Dr. Taylor testified that there was no need for a bone graft to treat the plaintiff's actual, correct diagnosis of a fractured, rotated lunate facet.

358 Dr. Taylor acknowledged that for the last ten years splints have been increasingly used with high impact injuries. However, he testified that casts are appropriate treatment if a person, who is proficient in putting on casts, properly applies and moulds the cast to the arm. He described the process of putting on a cast and gently working with the plaster to mould it to the shape of the arm.

359 Dr. Taylor confirmed that, after the successful reduction of a distal radial fracture, there was the need to immobilize the fracture. In his view, a cast was generally the most appropriate form of immobilization, unless "there was a good reason not to put a cast on."

360 In Dr. Taylor's evidence, he fairly confirmed circumstances in this case that may indicate that it is appropriate to use a splint, rather than a full circumferential cast and made other concessions that are helpful to the plaintiff. He testified:

- * If he or another surgeon was going to do surgery in one or two days on the plaintiff, he would have applied a splint.
- * Splints were commonly used for distal radial fractures, and a splint is a safer mode of treatment as it is easier to correctly apply than a cast.

- * If there was "worrisome swelling at the time of the initial injury," then a splint or a half-cast may be appropriate rather than a full cast, as it is easier to remove. Dr. Taylor confirmed that no one can predict the amount and type of swelling at the time of the initial treatment. Swelling may increase from 24 to 48 hours after the initial injury. I note that the plaintiff in this case had swelling from the outset as observed by the paramedic, the defendant who noted "+ swollen," and the plaintiff.
- * Where superficial swelling is anticipated, a splint, half cast, or a bivalved cast would accommodate swelling.
- * The closed reduction performed by the defendant was difficult. Two attempts were necessary. Dr. Taylor opined that the degree of force for the closed reduction was considerable, but was not as great as the force of the initial injury. Dr. Taylor testified that difficult reductions are not necessarily indicative of compartment syndrome developing. Not every difficult reduction results in compartment syndrome. The type of accident must also be taken into account.
- * The plaintiff had a dinner fork deformity, which is a very common Colles fracture. Dr. Taylor has seen hundreds of such fractures during his career. Dr. Taylor testified that the X-rays confirmed that, after the closed reduction and application of the cast, there was an excellent reduction of the radial styloid, but that the lunate facet was still significantly displaced. There was evidence that the scaphoid ligament ruptured, indicative of the degree of trauma and the degree of scaphoid lunate disassociation of some 180 degrees.
- * Unless the closed reduction was perfect, the plaintiff would need surgery by way of open reduction. Dr. Taylor confirmed unequivocally that the plaintiff needed further surgery "with or without the closed reduction" due to the rotated lunate facet.
- * Dr. Taylor understood that the plaintiff wanted Dr. Orsini to take over his case as the plaintiff and his family had great respect for him. He understood that the plaintiff was getting a second opinion to see the degree of displacement of the fracture fragment. Obtaining the second opinion would inevitably delay the surgery.

361 Dr. Taylor did not agree that it was below the standard of care not to split or bivalve the cast in this case where surgery was contemplated. He testified that a bivalved cast would compromise the cast's function to maintain the alignment of the styloid.

362 Dr. Taylor did not agree that anything that increases the risk of compartment syndrome was a breach of the standard of care. Dr. Taylor testified that the possibility of compartment syndrome would not influence his judgment on whether to use a cast or a splint in the plaintiff's circumstances, as the incidence of compartment syndrome is less than 1% of distal radial fractures. If compartment syndrome does develop, "you have to deal with that at the time."

Dr. Athwal's opinion on the standard of care

363 Dr. Athwal testified that the initial application of a closed circumferential cast after a closed reduction of a distal radius fracture was appropriate and reflected the practice taught at Queen's University and Western University. He testified that the defendant therefore met the standard of care in applying a full circumferential cast.

364 In his report he states that the application of the full circumferential cast after a closed reduction of a distal radius fracture is the standard at his place of employment. Dr. Athwal works at the Hand and Upper Limb Centre, which is the largest upper extremity center in Canada. He stated, "as this is the standard of care in my institution, which is in the province of Ontario, the treatment that Mr. Moore received at the Scarborough Hospital cannot fall below the standard of care."

365 Dr. Athwal significantly fails to mention in his report that the maintaining of a full circumferential cast assumes that the reduction was successful, and that no surgery was required.

366 Dr. Athwal testified that he teaches and recommends applying a full circumferential cast to all distal fractures as the preliminary step after the closed reduction, until the X-rays are available to see if the reduction was successful.

367 The next step is to review the X-rays to see if the closed reduction was successful and review the appropriate steps, if any, to be taken. Dr. Athwal's report did not outline the two-step process.

368 Dr. Athwal confirmed that treatment decisions are made after reviewing the X-rays. After reviewing the X-rays, a physician must decide to either leave the closed circumferential cast intact or bivalve the cast. He testified that the reasonableness of leaving the closed circumferential cast on the patient is informed by the treatment options after reviewing the X-rays.

369 Dr. Athwal testified that if the X-rays revealed that the reduction was successful - i.e., the bones were put back into their pre-injury anatomical position - then surgery could be avoided. The goal of the reduction in Dr. Athwal's words is a "perfect reduction."

370 Dr. Athwal testified that in this case, had the reduction been successful - i.e., had both bone pieces been anatomically aligned within the acceptable guidelines for the reduction of a fracture - he would have retained the full circumferential cast in place. I note that Dr. Richards disagreed with this, and testified that the cast should be bivalved in a high impact injury, even if the reduction was successful. As the plaintiff's reduction was not successful, I do not have to deal with this difference of opinion.

371 Dr. Athwal testified that the post-reduction X-rays revealed that there were two or three large fragments at the fracture site: one or two were the radial styloid showing a fracture of the dorsal volar surface; the other was the lunate facet on the outside of the hand. The largest piece of the joint was the radial styloid, which had been successfully reduced to a proper anatomical position. However, the lunate facet on the outside part of the wrist was depressed. The joint was not in the same line. The piece of the lunate facet had dropped down into the joint and was rotated 180 degrees.

372 Dr. Athwal then testified that what he would do with the closed circumferential cast after reviewing the X-rays depends on the patient's decision. If the plaintiff chose to have surgery with him or another surgeon, Dr. Athwal confirmed that he would have bivalved the plaintiff's cast pending the surgery.

373 Dr. Athwal confirmed that the plaintiff's request for a second opinion about surgery was entirely reasonable. He interpreted this request for a second opinion as meaning that surgery may not take place. He testified that some patients opt for a deformity rather than having recommended surgery, even in the case of a displaced fracture. Dr. Athwal opined that, as the plaintiff may not have had the recommended surgery, it was appropriate to maintain the closed circumferential cast.

374 I find that the evidence does not support Dr. Athwal's suggestion that a 21-year-old man working to become an electrician would choose to live with a deformity rather than have external fixation to align a bone fragment located in the wrist joint of his dominant right hand. Dr. Orsini's notes confirm that the median nerve was compromised prior to the surgery. The plaintiff wanted a second opinion about the bone graft, and was concerned about the defendant's inexperience as a qualified surgeon.

375 Further, the expert evidence does not support Dr. Athwal's suggestion that surgery was not necessary.

376 The defendant's notes and evidence confirmed that surgery was necessary, as did Dr. Richards and Dr. Taylor. Dr. Orsini observed potential nerve damage as a result of the injury requiring surgery. Clearly, external fixation was necessary to take the piece of rotated bone out of the wrist joint. Surgery was taking place, either with Dr. Orsini or someone else at North York General or with the defendant or Dr. Ali at Scarborough General.

377 Dr. Athwal's suggestion that surgery might not take place illustrates that he either seriously misunderstood the evidence, or that he distorted the evidence in favour of the defence.

378 Dr. Athwal testified that he would have bivalved the cast if the plaintiff was going to have surgery with him or another surgeon. As it became clear that, based on what Dr. Athwal would have done in the facts of this case, the defendant perhaps should have bivalved the cast, Dr. Athwal provided a new, alternative theory to support his conclusion that the full circumferential cast met the standard of care.

379 Dr. Athwal testified that other community orthopedic surgeons refer patients to him who require surgery. Those pre-surgery patients arrive at his clinic wearing full circumferential casts. Therefore, he reasoned that the practice of using full circumferential casts for patients requiring surgery exists in the orthopedic community. Based upon these observations of other cases referred to him, Dr. Athwal testified that the defendant met the standard of care in a community hospital in Ontario.

380 I note that this theory is not contained in Dr. Athwal's report before the court. I therefore I did not have the benefit of Dr. Richards' evidence commenting on Dr. Athwal's alternative theory. Plaintiff's counsel did not bring to my attention that this was a new theory not contained in Dr. Athwal's report, and the evidence was admitted without opposition.

381 I conclude that the standard of care of what a reasonably prudent orthopedic surgeon would do in 2005 in the circumstances of this case cannot be established by the fact that other orthopedic surgeons refer pre-surgery cases to Dr. Athwal in full circumferential casts.

382 There is no evidence about the facts of those referred cases and whether they are analogous to the facts of this case. There is no evidence that the referred cases involve high impact injuries in young men with a higher risk of developing compartment syndrome, with a rotated lunate facet displaced in the joint. There is also no information about when the underlying injury occurred. The risk of compartment syndrome appears to be for the first 24 to 48 hours after an injury when swelling takes place. If these out of town referrals to the specialty center were outside this time frame - which may be quite likely - they would have little in common with the facts of this case. Without knowing whether the referrals made to Dr. Athwal are analogous to this case, it is not possible to use Dr. Athwal's alternative theory to support the defence position as to standard of care.

383 I note that Dr. Athwal initially used misleading statistics as to the chance of developing compartment syndrome. He repeated that the chances were 1 in 300 to 400 individuals (.25% of cases). However, the literature that he canvassed and brought to the court's attention provides a credible study that the chances of developing compartment syndrome in young men in a high impact acute injury of the distal radius are significantly higher: 1.4% rather than .25%.⁴ Another article suggests a 30-fold increase in risk.⁵

384 Dr. Athwal acknowledged that applying a full circumferential cast is contraindicated when the swelling is abnormal and excessive, and the pain is disproportionate to the injury.

385 Dr. Athwal co-authored an article with Dr. Robert Turner and Dr. Kenneth Faber that discusses the complications of distal radius fractures.⁶ The excerpts of the article were put to Dr. Richards in his evidence-in-chief about treatment of high energy distal radius fractures in young men. Dr. Richards agreed with the contents of the article. The article provides the following at page 85:

Mild carpal tunnel symptoms are common and are usually related to swelling and contusion around the median nerve. In patients who have significant hand and wrist swelling, splints or bivalved casts should be used rather than circumferential casts. [Emphasis added.]

386 At page 86 the article continues:

Compartment Syndrome

Compartment syndrome is a rare complication but can have dramatic consequences. Your male patients are most at risk because they are more likely to have sustained a high-energy injury.

...

Acute injuries should be supported with noncircumferential splint and bandages. Although a cast may provide better support to an unstable fracture, it may not accommodate swelling and should be used with caution. If concerns exist about the risk of developing compartment syndrome, the patient should be admitted for limb elevation and observation.

Cast Issues

Applying a full cast on an acute injury will not accommodate subsequent swelling. It may be used for unstable fractures, but patients should be warned of the potential complications of increased pain, nerve compression and ultimately compartment syndrome. A noncircumferential splint provides less support to the fracture, but will accommodate swelling.

Posttrauma swelling reduces in the days and weeks after the injury. The cast may become loose and should be changed. If a noncircumferential splint was initially applied, then it may be replaced by a complete cast at 10 to 14 days. [Emphasis added.]

387 Dr. Athwal sought to distinguish the applicability of the principles outlined in the article that he co-authored based upon his understanding that there was no excessive swelling or pain and the plaintiff was "comfortable" after the cast had been put on.

388 As I have outlined, the evidence before me confirms that the plaintiff was not comfortable at any time before or after the cast was applied. The plaintiff testified that he experienced significant pain and swelling both before and after the cast was applied, which the defendant told him was normal. When asked if the cast was too tight, the plaintiff testified that he could not answer, as he could not feel the cast due to the pain. He had numbness, tingling, swelling, and pain after the cast was applied. The plaintiff - who is no stranger to sports injuries - testified that he was alarmed.

Conclusions on the Standard of Care

389 I accept Dr. Richards' evidence on the standard of care. There is more than one acceptable mode of treatment in high impact distal radius fractures. To meet the standard of care of a reasonably prudent orthopedic surgeon in a community hospital in Ontario in 2005, an orthopedic surgeon in this case should either have applied a splint or a bivalved cast that was split to the skin.

390 There are regional differences between the use of splints or bivalved casts in a case such as this. Physicians appropriately exercise clinical judgment and meet the standard of care in Ontario if they use one of these two treatment options.

391 It appears clear from Dr. Richards and Dr. Taylor's evidence that the trend is away from full casts. Dr. Richards explained that splints can accommodate swelling to avoid possible compartment syndrome. Dr. Taylor observed that splints are much easier to put on correctly, and are easy to remove in case of problems. Dr. Athwal testified that the only compartment where casts continue to be applied is to the wrist in some parts of the province. All other compartments are treated with splints capable of accommodating swelling.

392 In this case, the evidence confirms that significant swelling was to be anticipated due to the high impact injury. The plaintiff traveled at some 40 to 50 km per hour, hitting a hummer vehicle. Swelling was noted from the outset by the paramedic and by the defendant's "+ swollen." A closed circumferential cast could not accommodate the swelling that would inevitably occur.

393 I conclude that applying a full circumferential cast in this case was contraindicated and below the applicable standard of care, regardless of the amount of padding. For reasons previously outlined, I conclude that the padding issue in Dr. Richards' report is not relevant to assisting the standard of care. I note that no other expert suggested that the amount of padding in a full circumferential cast could accommodate the swelling in a high impact injury.

394 I do not accept Dr. Taylor's evidence that the standard of care was met in this case. I do not accept his evidence that it was of paramount importance to maintain the alignment of the styloid radius pending the anticipated surgery at all costs. I do not accept his approach of wait and see when it comes to compartment syndrome, and "deal with that at the time" as the risk is low. Dr. Taylor candidly confirmed that if he or another surgeon was going to do surgery in one or two days he would have applied a splint in this case.

395 I do not accept Dr. Athwal's evidence that the standard of care was met by the maintenance of the full circumferential cast in this case. The X-rays revealed that the reduction was only partially successful. It was clear that the lunate facet was located in the joint and required open reduction surgery.

396 In my view, a serious omission in Dr. Athwal's report and evidence was what he taught his medical students and residents was appropriate treatment when the closed reduction was only partially successful and surgery was contemplated in a high impact injury in a young man. In this case, the post-reduction X-rays demonstrated that the lunate facet was significantly displaced by 180 degrees, with a persistent intra-articular gap and step, and it was in the joint.

397 I conclude, to meet the standard of care in this case, after reviewing the X-rays it was necessary to remove the cast and splint the injury, or to bivalve the cast to the skin. Either of these two treatments would accommodate anticipated swelling from this high impact injury. Either treatment is a necessary preventative measure to reduce the known risk of compartment syndrome in a patient such as the plaintiff.

398 The necessity of splinting or bivalving the cast to the skin was clear in this case. The plaintiff openly complained to the defendant of continued numbness and significant pain after the cast was applied.

399 I accept Dr. Richards' opinion as to the applicable standard of care. Further, I accept his evidence that all reasonable steps should be taken to avoid the known risk of developing compartment syndrome. Given the potentially devastating consequences of compartment syndrome, using a treatment that even marginally increases the risk of compartment syndrome is below the standard of care when other acceptable treatments are available. As Dr. Richards stated, a basic tenet in medicine is that the physician should "do no harm."

Failure to Adequately Educate and Warn the Plaintiff

400 Patient education is important. Compartment syndrome is a real risk that must be explained to patients who experience a high impact injury.

401 In *Tacknyk*, the Ontario Court of Appeal confirms that a physician's duty of care does not stop after completion of treatment. The physician has a continuing duty to provide "adequate advice and direction." The extent of a physician's duty to educate and warn a patient depends on many factors, including "the degree of risk to which the patient is susceptible" to complications: at para. 26.

402 Both Dr. Richards and Dr. Athwal talked of the importance of educating patients about the risks and the signs of compartment syndrome.

403 In the article co-authored by Dr. Athwal, he confirms the duty to inform and warn:

[A]pplying a full cast on an acute injury will not accommodate subsequent swelling. It may be used for unstable fractures, but patients should be warned of the potential complications of increased pain, nerve

compression and ultimately compartment syndrome. A non-circumferential splint provides less support to the fracture, but will accommodate swelling.⁷ [Emphasis added.]

404 I refer to the above noted excerpt with reference to the duty to warn. This does not change my conclusions about the need to bivalve a cast if the reduction is only partially successful and surgery is contemplated.

405 Dr. Athwal explained the meaning of this reference in the article:

Q. There is an issue with cast in your own article not accommodating swelling and we have already gone through that swelling can increase and perhaps, dramatically over 24 hours. That's why you informed the patient clearly about compartment syndrome and that's why you want them to understand the consequences of it?

R. Correct. ... I just want them [the patient] to be sure of what to look out for to prevent the complication.

406 An article cited by Dr. Athwal with approval begins with the following statement:

The most important determinant of a poor outcome from acute compartment syndrome after injury is delay in diagnosis. The complications are usually disabling and include infection, contracture and amputation. One of the main causes of delay may be insufficient awareness of the condition. ... Awareness of the risk of the syndrome may reduce delay in diagnosis.⁸ [Emphasis added.]

407 In the evidence before me based upon the limited research available in this area, it appears that the risk of developing compartment syndrome in high impact injuries in young men according to one study is about 1.4%.⁹ The second study confirms that there is a 30-fold increase in the usual risk of developing compartment syndrome.¹⁰

408 I agree with Dr. Richards' evidence that the incidence of compartment syndrome in cases such as the plaintiff is uncommon but not rare. Compartment syndrome can have disastrous consequences. Early diagnosis is important. Therefore, I find that physicians are required to educate and warn patients who have suffered a high impact injury, particularly young men who are at an enhanced risk, about the symptoms and potential consequences of compartment syndrome and what to do if these symptoms occur.

409 The defendant's steps in this case to educate the plaintiff about the possible development of compartment syndrome were inadequate.

410 It was clear that the defendant treated this injury as routine. His treatment and instructions reflect his relaxed view of the situation. His only specific instructions were to keep the cast dry and clean and to keep his arm elevated and bolstered while sleeping. The plaintiff was told to read the pamphlet, which he in fact did. This was not a fracture caused by skating on the Rideau Canal in Ottawa where the defendant had experience with routine distal radial fractures. Mr. Moore travelled at a high speed. He and his motorcycle impacted a hummer vehicle, causing it to displace two feet.

411 The defendant did not educate the plaintiff about the possible risk of developing compartment syndrome. The defendant knew that the plaintiff was a 21-year-old young man with a high impact injury; the fracture was not reduced; and a significant piece of bone was in the wrist joint and rotated 180 degrees after the closed reduction. The plaintiff complained of significant pain and numbness after the cast was put on. Clearly, he was one of the young men at elevated risk of developing compartment syndrome.

412 Perhaps the defendant does not need to use the words "compartment syndrome." However, in this case an orthopedic surgeon needs to inform patients that are susceptible to compartment syndrome about the symptoms, the urgency, and the very serious consequences if left untreated. The more specific the education the better if a patient has to go to a crowded city emergency department in case of complications. Appropriate patient education may well have helped the plaintiff express his concerns to the triage nurse.

413 Instead of warning the plaintiff, the defendant reassured him that pain and swelling in a high impact injury were normal for two to three days.

414 When the plaintiff awoke with increased pain and swelling, the father initially thought it was normal and to be expected, based upon the information given to them by the defendant.

415 Thankfully, despite the inadequate warning and explanation, the plaintiff followed his instincts that "something was not right" and asked to go to the emergency department.

416 Had the defendant properly educated the plaintiff in his father's presence about the risks associated with his injury, the plaintiff may well have gone immediately to the emergency department. He probably would have been less stoic and more insistent about his pain and tight cast at North York General Hospital the next day when he met the triage nurse had he known the potential consequences of compartment syndrome.

417 The literature confirms that early detection of the condition is crucial. However, there is no expert evidence before me on whether earlier detection and earlier cast removal could or would have had any effect on the outcome of this case. Therefore, the defendant's failure to adequately warn the plaintiff about compartment syndrome is relevant to the breach of the standard of care, but it is a neutral fact when it comes to the issue of causation.

Case Law on Causation

418 The plaintiff must show that the defendant's breach of the standard of care caused the plaintiff's injury. Case law provides two tests to establish causation: the "but for" test and the "material contribution to risk of injury" test: *Clements v. Clements*, [2012 SCC 32](#), [\[2012\] 2 S.C.R. 181](#).

419 The "but for" test is the primary test to determine causation: *Clements*, at para. 8. The plaintiff must show on a balance of probabilities that the injury would not have occurred but for the defendant's negligence: *Snell v. Farrell*, [\[1990\] 2 S.C.R. 311](#). The "but for" test is a factual inquiry: *Clements*, at para. 8. The Supreme Court of Canada provides the following guidelines in *Clements* at paras. 9 and 10:

The "but for" causation test must be applied in a robust common sense fashion. There is no need for scientific evidence of the precise contribution the defendant's negligence made to the injury.

A common sense inference of "but for" causation from proof of negligence usually flows without difficulty. Evidence connecting the breach of duty to the injury suffered may permit the judge, depending on the circumstances, to infer that the defendant's negligence probably caused the loss.

420 Inferences of causation must be based on reliable facts. The plaintiff must provide some evidence that the defendant's negligence caused the injury: *Clements*, at para. 56. In *Aristorenas v. Comcare Health Services* ([2006](#)), [83 O.R. \(3d\) 282](#), the Court of Appeal clarifies the following at para. 54:

The "robust and pragmatic" approach is not a distinct test for causation but rather an approach to the analysis of the evidence said to demonstrate the necessary causal connection between the conduct and the injury. Importantly, a robust and pragmatic approach must be applied to evidence; it is not a substitute for evidence to show that the defendant's negligent conduct caused the injury.

421 It is a "misapplication of the 'robust and pragmatic' approach to make a finding or draw an inference of causation where" the plaintiff fails to provide any evidence that the defendant's negligence caused the injury: *Aristorenas*, at para. 64.

422 In order to recover, the plaintiff need not prove that the defendant's negligence was the sole cause or the predominant cause of the plaintiff's injury. The defendant's negligence must only be a cause, not the cause. There

may be multiple "but for" tortious and non-tortious causes of the injury. For example, a fire ignited in a wastepaper basket is caused by the dropping of a lit match, combustible material, oxygen, a failure to empty the basket, and so forth. As long as the defendant is a necessary cause of the injury, the defendant is liable, even though his act alone was not sufficient to create the injury: *Clements*, at para. 8; *Blackwater v. Plint*, [2005 SCC 58](#), [\[2005\] 3 S.C.R. 3](#), at para. 78; and *Athey v. Leonati*, [\[1996\] 3 S.C.R. 458](#), at para. 17.

423 Both counsel submitted that the "but for" test applies in this case.

424 In exceptional circumstances, a plaintiff may "recover on the basis of 'material contribution to risk of injury,' without showing factual 'but for' causation": *Clements*, at para. 13. The plaintiff must only show that the defendant's negligence materially contributed to the risk of injury. This test is not applicable in this case.

425 The "but for" test and the material contribution to risk of injury test are "two different beasts": *Clements*, at para. 14. The former is a factual inquiry into what likely happened. The latter removes the requirement of "but for" causation. It is a policy-driven test designed to permit plaintiffs to recover in cases despite their failure to prove causation: *Clements*, at para. 14.

Overview of the Causation Issue

426 Compartment syndrome is a well-recognized emergency and is known to orthopedic surgeons from the beginning of their training in medical school. Surgeons are trained to take preventative measures to avoid the development of compartment syndrome, diagnose it, and treat it.

427 The literature confirms that trauma is the initial cause of compartment syndrome. Clearly in this case, without the trauma and the underlying injury, the plaintiff would not have developed compartment syndrome. This fact is a given, and is not disputed.

428 The evidence and literature are clear that compartment syndrome can develop in fractures with a full cast, a bivalved cast, a splint, or no dressing at all, as well as in other injuries such as burn or crush injuries.

429 In this case, when a full circumferential cast is applied, two factors affect the ability of the muscle to swell: the internal fascia and the external plaster cast.

430 In this case, for reasons that I have outlined, I have concluded as a fact based upon the evidence that when the cast was removed the compartment syndrome had developed and was irreversible, and a fasciotomy was necessary to relieve the pressure.

431 The issue to assess with respect to causation is the impact, if any, of the application of the closed circumferential cast to the plaintiff's underlying injury on the development of the compartment syndrome.

432 Dr. Richards opined that on a balance of probabilities the application of the full circumferential cast upon the plaintiff's underlying injury caused the plaintiff's compartment syndrome to develop.

433 Dr. Taylor and Dr. Athwal acknowledged that the presence of a full circumferential cast can aggravate, or exacerbate, the development of compartment syndrome. However, both testified that the cast did not cause compartment syndrome to develop. They testified that the underlying injury and trauma caused the development of the compartment syndrome. The trauma of the injury caused the swelling in the compartment that if limited externally will increase the pressure in the compartment causing the cycle of continuous and increased swelling.

Review of Each Expert's Evidence on Causation

Dr. Richards' opinion on causation

434 Dr. Richards testified, "I think the likelihood is that if he [the plaintiff] had the fracture and no treatment at all, he would probably not have got the compartment syndrome, but [would have] had a crooked arm." He also testified that, "if [the plaintiff] had had the fracture and the fracture reduced and put in a splint or a bivalved cast, he probably wouldn't have got the compartment syndrome. That is my opinion."

435 Dr. Richards' opinion confirms that the "but for" test as defined in the caselaw has been met.

436 Dr. Richards was clear that the development of compartment syndrome involved the interaction of multiple causes. He testified that it was more probable than not that the plaintiff's compartment syndrome was caused by (i) the initial injury, (ii) the application of a full circumferential cast to that injury, and (iii) the soft tissue injury and hemorrhage that occurred with the initial fracture. There were multiple causes of the syndrome. The compartment syndrome would not have developed without the underlying injury and the swelling that resulted from that injury.

437 The plaintiff filed two diagrammatic depictions to explain the development of compartment syndrome when a full circumferential cast was applied to the plaintiff's injury. Dr. Richards commented on and adopted these depictions as correctly explaining how the circumferential cast caused the development of compartment syndrome in this case. He testified that the rigid plaster circumferential cast cannot accommodate anticipated swelling in the compartment and thereby causes pressure in the muscle compartment. Thus, the cycle of compartment syndrome begins and may continue to the point that the process becomes irreversible.

438 Dr. Richards agreed with the cautions and contraindications of applying a full circumferential cast in the article co-authored by Dr. Athwal in support of his conclusion that the full circumferential cast played a role in the development of the compartment syndrome in the plaintiff, including the following excerpt from the article:

Acute injuries should be supported with a non-circumferential splint and bandages. Although a full cast may provide better support for an unstable fracture, it may not accommodate swelling and should be used with caution. If concerns exist about the risk of developing compartment syndrome, the patient should be admitted for limb elevation and observation.¹¹ [Emphasis added.]

439 Dr. Richards referred to a recognized text used by orthopedic surgeons, *Rockwood and Green's Fractures in Adults*, filed as Exhibit 8 in support of this proposition.¹² At 331 and 332, the textbook provides that tight casts are known to be associated with the development of compartment syndrome.

440 Defence counsel objected to Dr. Richards referring to this textbook as it was not specifically mentioned in his report. I did not agree with the defence submission that Dr. Richards could refer only to textbooks referred to in his report. This is a standard, recognized textbook used by orthopedic surgeons.

441 Dr. Richards testified that it is common medical knowledge that a tight cast can cause compartment syndrome. As an illustration, not of learned literature available only to orthopedic surgeons, Dr. Richards attached to his letter dated April 16, 2012 a Google Search on compartment syndrome that is available to the public. The evidence from this search includes the following excerpts:

Pg. 1. Acute compartment syndrome is a medical emergency. It is usually caused by a severe injury. Without treatment, it can lead to permanent muscle damage.

Pg. 3.

Conditions that may bring on acute compartment syndrome include:

...

Constricting Bandages

Casts and tight bandages may lead to compartment syndrome. If symptoms of compartment syndrome develop, remove or loosen any constricting bandages. If you have a cast, contact your doctor immediately. [Emphasis added.]

442 Dr. Richards relied on certain facts to support his conclusion that the tight cast in this case caused the compartment syndrome. Dr. Richards relied on Dr. Orsini's inpatient operative report, dictated three days after the surgery:

The following day he had increasing pain and came to North York General Hospital and his cast was split by Dr. Russel Tanzer in the Emergency Department. He had really no significant relief of his pain. At this point he had significant pain, numbness and weakness of his entire right hand. He did have hand weakness and numbness following his injury but it had worsened with the tight cast. [Emphasis added.]

443 Dr. Richards also relied on Dr. Tanzer's observations on November 13, 2005 that the cast was tight, as reflected in Dr. Orsini's notes.

444 Dr. Richards relied on his meeting and assessment of the plaintiff. The plaintiff told him that "the cast was tight and painful. He had to go back to the hospital." During the assessment, the plaintiff described his pain symptoms, and Dr. Richards noted that the plaintiff had symptoms of throbbing pain.

445 Dr. Richards opined that applying a tight cast, without any underlying injury, could cause compartment syndrome on its own. Defence counsel challenged Dr. Richards' opinion as no scientific studies show that tight casts alone can cause compartment syndrome. Dr. Richards responded that his opinion was common sense. The tighter the cast or the external bandages, the higher the risk of compartment syndrome. Any external pressure necessarily reduces the compartment size. Obviously there have been no studies to support Dr. Richards' opinion that a tight cast alone can cause the development of compartment syndrome, as such a study would be unethical.

446 Dr. Richards acknowledged that an injury alone, without any cast, could cause compartment syndrome; an injury deep in the muscle can cause pressure on the muscles and nerves.

447 Dr. Richards confirmed, "I have said what I think caused the compartment syndrome." He was firm in his view that, on a balance of probabilities, the tight circumferential cast combined with the underlying injury and the swelling resulting from the injury caused pressure to develop in the compartment and the development of compartment syndrome.

448 Dr. Richards acknowledged that the plaintiff would not have developed compartment syndrome if he did not have the underlying injury. This fact is obvious and does not help in the analysis of causation. Of course, if the plaintiff did not have the underlying injury, to which a circumferential cast was applied, there would be no compartment syndrome.

449 Dr. Richards confirmed that there was abundant evidence that the plaintiff had compartment syndrome before the surgery, but that until the surgery takes place the diagnosis cannot be made 100%.

450 Dr. Richards confirmed that the observations in Dr. Orsini's operative notes dated November 16, 2005 that the muscles were viable, red, bleeding, and contractile do not mean that muscle damage had not occurred. Dr. Richards stated that the muscle "certainly wasn't normal, but it was alive."

451 In his opinion, given the plaintiff's permanent disabilities, muscle damage had occurred by the time surgery took place, but complete muscle death and necrosis had not. Dr. Richards confirmed that, if the compartment syndrome had not been caught in time, the plaintiff could have lost his arm.

Dr. Taylor's opinion on causation

452 In Dr. Taylor's view, the underlying injury caused the compartment syndrome. His logic was that, had there not been an underlying injury, compartment syndrome would not have developed.

453 Dr. Taylor testified that "you have to have an injury to have a compartment syndrome and any occlusive dressing can aggravate the problem, but it doesn't cause it. You have to have an injury within the compartment to start the process of the compartment syndrome."

454 Dr. Taylor confirmed that in this case the full circumferential cast was an aggravating factor with respect to the compartment syndrome.

455 Dr. Taylor agreed that the cast could act like an external compartment on the skin and push back against the compartments, so "that's why it can be an aggravating factor."

456 He also testified that it is reasonable to anticipate increased swelling during the first 24 to 48 hours after the injury. The constrictive dressing limits the skin's ability to swell within the compartment.

457 He explained the role of the cast as an aggravating factor. Swelling takes place. The cast pushes back against the swollen tissue, aggravating but not causing the situation to develop. A tight cast can aggravate the underlying injury as it is located close to the compartment and cannot accommodate swelling within the compartment.

458 Dr. Taylor testified about the effect of the cast on the development of the compartment syndrome when the cast was removed at 2:00 p.m. He confirmed that the cast "certainly was an aggravating factor and had to be removed."

459 After the cast was removed at 2:00 p.m., it was no longer an aggravating factor as the compartment syndrome was already established and irreversible at that point.

460 Of note is that at no time in his evidence did Dr. Taylor express the opinion that had the cast not been present, the compartment syndrome would have developed.

461 Dr. Taylor had one case of upper extremity compartment syndrome in his career and 12 cases of lower extremity compartment syndrome where no cast had been applied. Dr. Taylor testified that, with a high impact injury of the volar forearm, compartment syndrome can develop in the absence of a cast or splint. However, in Dr. Taylor's one personal experience, once the cast was removed, the problem rectified. The pressure in the compartment did not warrant surgery. Therefore, it appears that in Dr. Taylor's one case of upper extremity compartment syndrome, the cast caused the symptoms of compartment syndrome to begin. Once the cast was removed, the process of development stopped and surgery was not necessary. In Dr. Taylor's case, the developing compartment syndrome was caught and the cast was removed before the process had become irreversible.

462 The facts of this case were put to Dr. Taylor. In examination-in-chief, defence counsel asked him when the compartment syndrome started. He answered that there are two extremes: it could have started at 7:30 a.m. or after the cast was removed. In cross-examination, Dr. Taylor testified that the compartment syndrome could have started at night when the plaintiff was sleeping after taking Tylenol 3 for his pain. Dr. Taylor's evidence did not assist in determining when the compartment syndrome began, nor how that may relate to the presence of the cast.

463 I have outlined my findings of fact that the compartment syndrome was established before Dr. Tanzer's diagnosis and before the cast was split based upon the plaintiff's evidence of his symptoms and Dr. Tanzer's evidence of his observations and diagnosis.

Dr. Athwal's opinion on causation

464 Dr. Athwal testified that in his opinion the full circumferential cast was not the cause of the compartment

syndrome. Based upon the scientific literature, the trauma is the etiology of the compartment syndrome. In this case, the fracture in the high energy motorcycle accident was the precipitating causal event for the development of the plaintiff's compartment syndrome. Dr. Athwal testified, "you need to have the injury, and if your injury is high energy, you are at risk for compartment syndrome." The "etiology is actually the trauma, the first eliciting event" (emphasis added).

465 In support of his opinion on causation, Dr. Athwal testified that compartment syndrome develops in other injuries where casts are never used; therefore, if compartment syndrome develops, it has to be a result of the underlying injury. He stated as follows:

In other injuries when compartment syndrome can occur we always put splints on and compartment syndrome can still occur. So using examples of other compartment syndromes that occur, casting is not done. So with tibia, femur, elbow, we always put splints on and patients can still get compartment syndrome. So the precipitating factor was the injury.

466 His reasoning is not helpful in this case. It is not disputed that compartment syndrome can develop without any sort of restrictive dressing, and the underlying trauma is "the first eliciting event." Clearly Dr. Athwal is correct that, in cases where a cast is not applied, a cast played no role in the development of the compartment syndrome. However, the fact that compartment syndrome can develop when no cast is applied does not assist in this case to determine the impact, if any, in this case of the application of a full circumferential cast on the plaintiff's injury to the development of compartment syndrome.

467 Dr. Athwal acknowledged that the precipitating injury causes the muscles in the compartment to begin to swell. The fascia is the first restrictive limit for swelling. He confirmed that the next restrictive limit to swelling is the full circumferential cast.

468 Dr. Athwal acknowledged, based on a hand written note found in his file in his handwriting, that the presence of a cast could increase the risk of compartment syndrome. However, he testified that it has not been scientifically proved that applying a full circumferential cast could cause compartment syndrome. He stated, "I agree cast was an acceerbating [exacerbating] factor in the development of the compartment syndrome." I note that Dr. Athwal did not include this important acknowledgment in his report.

469 Counsel asked Dr. Athwal whether the compartment syndrome would have occurred if a different form of dressing had been applied, a splint or a bivalved cast. Dr. Athwal replied that, to his knowledge, there is no literature, personal experience, or clinical study that says a bivalved cast or non-circumferential dressing makes any difference. It was his opinion that the high energy trauma is the eliciting factor.

470 However, Dr. Athwal also testified that, because a full circumferential cast is an exacerbating factor, he would bivalve the cast to accommodate swelling. He acknowledged that, if compartment syndrome is going to happen, a full cast could bring it on "faster" and make it "worse."

471 Dr. Athwal testified that no scientific literature confirms that the use of a circumferential cast affects the development of compartment syndrome. I do not accept this evidence.

472 The plaintiff's counsel cross-examined Dr. Athwal on recognized professional literature that confirms that tight casts are associated with or cause compartment syndrome, including the article that Dr. Athwal co-authored. He did not accept these references as being scientifically proved or applicable in this case.

473 Dr. Athwal did not accept the following principles outlined in *Rockwood and Green's Fractures in Adults* at 331-332:

Pathophysiology

A simple working definition of a compartment syndrome is an increased pressure within an enclosed osteofascial space that reduces the capillary blood perfusion below a level necessary for tissue viability. This situation may be produced by two mechanisms: an increase in volume within an enclosed space, and a decrease in size of the space.

An increase in volume occurs in the clinical setting of hemorrhage, postischemic swelling, reperfusion, and arterial venous fistula. A decrease in size is the result of too tight a cast, constrictive dressings, pneumatic antishock garments, and closure of fascial defects. As the pressure increases in the tissue, it exceeds the low intramuscular arteriolar pressure, causing decreased blood flow in the capillary anastomosis and shunting within the compartment. Elevation of the tissue fluid pressure results in a lowering of capillary blood flow. If a significant period of decreased flow results, microcirculatory ischemia produces necrosis of the tissues within the compartment.

...

The clinical conditions that may be associated with a compartment syndrome include fractures, soft tissue injuries, arterial injuries, drug overdose, limb compressions, burns, postischemic swelling, constrictive dressings, and tight casts. The one constant factor in these conditions is that intercompartmental fluid accumulates inside a very tight, impermeable fascial envelope, causing the initial event. As increased intracellular calcium concentrations occur following ischemia, there is a shift of water into the muscle fibers, further compounding the problem. [Emphasis added.]

474 Dr. Athwal was also cross-examined on chapter 12 from Browner et al., eds., *Skeletal Trauma: Basic Science, Management, and Reconstruction*, 3d ed. (Philadelphia: Saunders, 2003), written by A. Amendola and B. Twaddle on compartment syndrome. The beginning of the chapter explores compartment syndrome of all types. The authors note at 269 that "any condition that increases the content or reduces the volume of a compartment would be related to the development of an acute compartment syndrome."

475 Amendola and Twaddle specifically consider the issue of casts at 270:

Considering the underlying pathophysiology, the cause of a compartment syndrome may be related more specifically to conditions that decrease the size or increase the contents of a compartment. ... The most common cause of compartment syndrome associated with the decrease in the size of the compartment is the application of a tight cast, constrictive dressings or pneumatic anti-shock garments. [Emphasis added]

476 Dr. Athwal pointed out that one of the authors of this chapter is a foot surgeon, not a wrist surgeon. He used this as a reason for not accepting this as authoritative and applicable in this case. However, I note that this chapter, which he acknowledged to be a reputable reference source for all orthopedic surgeons, addresses all types of compartment syndrome. It describes in detail surgical procedures used for compartment syndrome of the forearm.

477 Dr. Athwal was also cross-examined on "Delayed Onset of Forearm Compartment Syndrome: A Complication of Distal Radius Fracture in Young Adults:"

Compartment syndrome may be defined as a condition in which capillary perfusion is inadequate to sustain tissue viability, consequent upon high pressure within a closed fascial space...

Since the original clinical definition, the condition has been described in association with acute fracture of the forearm bones, the use of constricting dressings or plaster casts...

and various miscellaneous conditions that reduce volume or increase pressure within the compartment.¹³ [Emphasis added.]

478 Dr. Athwal testified that being "associated with compartment syndrome" is different from causing compartment syndrome. He also challenged the authors' proposition that tight casts are associated with compartment syndrome, however, in cross-examination, he made this concession.

479 Dr. Athwal rejected the literature presented to him, and confirmed that "scientific proof that is what you are looking for as an academic." Cause in the medical sense means "statistically speaking" with tests we can run and reproduce something to prove something statistically. He steadfastly refused to accept the literature that confirmed that a tight cast can cause compartment syndrome. He claimed that this proposition has not been scientifically proved and has not been properly footnoted. He claimed that, when you make a statement, it must be based "on scientific fact." He stated, "This quote in the textbook is not referenced, so in the medical literature, if we say this thing causes something else it has to be referenced -- I would probably email him and ask him so where did you get it from?"

480 The absence of scientific proof that a tight cast can cause compartment syndrome is an important factor that underpins Dr. Athwal's opinion that the cast in this case did not cause the development of the compartment syndrome.

Conclusions on Causation

481 In this case, a full circumferential cast was applied and was not bivalved. I have concluded that this treatment was below the applicable standard of care. Two modes of treatment meet the standard of care of a reasonably competent orthopedic surgeon in a community hospital in Ontario in 2005, where there is a high impact injury, the closed reduction is partially successful, and surgery is contemplated: (i) application of a splint or (ii) a bivalved cast cut to the skin.

482 Further, it is clear that compartment syndrome can develop in the upper extremity without a cast being applied. Dr. Athwal's evidence confirmed that a dorsal radial or ulnar fracture is the only compartment of the body where compartment syndrome can develop that is still treated with casts in some centers in Ontario. All other compartments in the body are treated now with splints or other non-constrictive supportive dressings.

483 The issue to assess with respect to causation is the impact, if any, of the application of the closed circumferential cast to the plaintiff's underlying injury on the development of the compartment syndrome.

The defence evidence establishes causation

484 The defendant's experts testified that the underlying injury was the cause of the compartment syndrome. Both defence experts agreed that the rigid plaster cast is the second barrier to the swelling. The first barrier is the fascia, which contains the muscle, nerves, and blood vessels in the compartment. Both defence experts agreed that a full circumferential cast may aggravate (Dr. Taylor) or exacerbate (Dr. Athwal) the compartment syndrome by making it worse and by speeding up the development process.

485 Dr. Taylor did not testify that, had the circumferential cast not been applied, the plaintiff's compartment syndrome would have developed anyway. This case may be distinguished from Dr. Taylor's one experience with upper limb compartment syndrome. In Dr. Taylor's case, the symptoms fortunately abated after he removed the cast. A fasciotomy was not necessary.

486 Dr. Athwal testified that, once the underlying injury causes compartment syndrome to develop, the "dye is cast." The condition would continue to progress and the only treatment is a fasciotomy. I do not accept his conclusion. I accept as a fact that, regardless of the cause of the compartment syndrome, with or without a cast, at some point the condition becomes irreversible. In that sense, the "dye is cast." Dr. Athwal's statement does not assist in determining what role, if any, the application of a full circumferential cast played in causing the development of compartment syndrome.

487 I find that neither Dr. Taylor nor Dr. Athwal understood the legal test for causation. Neither appeared to understand that there could be more than one "but for" cause. Both Dr. Taylor and Dr. Athwal appeared to think

causation involved one cause, and one cause only, that is the underlying injury. Dr. Athwal used the words "etiology is actually the trauma, the first eliciting event" (emphasis added).

488 Applying the "but for" test, the plaintiff need not prove that the defendant's negligence was the sole cause or the predominant cause of the plaintiff's injury. The defendant's negligence must only be a cause, not the cause. Causation may be multi-faceted. There may be multiple "but for" tortious and non-tortious causes of the injury. As long as the defendant is a necessary cause of the injury, the defendant is liable, even though his act alone was not sufficient to create the injury: *Clements*, at para. 8; *Blackwater*, at para. 78; and *Athey*, at para. 17.

489 In this case, there is no dispute that the underlying injury is one of the "but for" causes of the plaintiff's compartment syndrome. If the underlying injury had not occurred, there would be no fracture, no swelling, no need to apply a cast, and no compartment syndrome. This does not assist in determining the role, if any, of the application of a rigid, plaster cast in the development of the plaintiff's condition.

490 I note that Dr. Athwal's opinions on causation are problematic quite apart from his view that causation is limited to one cause. Dr. Athwal understands causation in this lawsuit to mean scientific causation - i.e., "causation statistically speaking" with proven correlations. Dr. Athwal stated, "I don't know what causation is in a legal sense. I know what it is in a medical sense. So, when I refer to a medical sense -- when I refer to causation, I am referring to it as a medical sense." Dr. Athwal's insistence on scientific proof, and his refusal to accept propositions in standard textbooks that tight casts can cause compartment syndrome, undermine the reliability of his evidence.

491 Plaintiffs are not required to meet a standard of scientific proof to be able to prove causation: *Clements*, at para. 9. A gold standard of scientific proof of a single cause would be impossibly high.

492 I conclude, contrary to Dr. Athwal's views, that reputable medical literature confirms that a tight cast applied to an underlying high impact injury may cause the development of compartment syndrome.

493 The defence experts acknowledged that the cast aggravated or exacerbated the compartment syndrome. It was not clearly argued by plaintiff's counsel that the evidence of the defence experts alone is sufficient to prove causation. It appears that these admissions, without considering Dr. Richards' evidence, support a finding of causation in this case.

494 The caselaw confirms that a plaintiff can prove causation by showing that a defendant's negligence aggravated or exacerbated an existing injury or condition: see e.g. *Price v. Milawski*, [1976] O.J. No. 228 (H. Ct. J.), aff'd (1977) 18 O.R. (2d) 113 (Sup. Ct. App.); *Wood v. Cobourg District General Hospital* (1999), 125 O.A.C. 370 (C.A.); *Johal v. Conron*, 2013 BCSC 1924, [2013] B.C.J. No. 2318; see also *Snell*, at p. 331; *Athey*; and Erik S. Knutsen, "Clarifying Causation in Tort" (2010) 33 Dal. L.J. 153.

495 The textbook, Lewis N. Klar, *Tort Law*, 5th ed. (Toronto: Thomson Reuters, 2012), was published after the Supreme Court's decision in *Clements* and cites *Clements* in its discussion of causation. At 485, the author confirms that a defendant is liable for the "exacerbation of a manifest, on-going pre-existing injury, or the acceleration of an existing degenerative process."

496 Cases where a defendant's negligence aggravates a plaintiff's pre-existing injury or condition are sometimes referred to as "crumbling skull" cases. The crumbling skull doctrine is relevant to assessing damages. In *McCulloch v. Isaac*, 2013 BCSC 1319, [2013] B.C.J. No. 1626, at para. 94, the court cites a past case, *Pavlovic v. Shields*, 2009 BCSC 345, [2009] B.C.J. No. 502, at para. 56, with approval: "A 'crumbling skull' injury is ... one where there is a pre-existing condition, but [the condition] is active or likely to become active regardless of the accident. If the injury is proven to be of a crumbling skull nature, then the plaintiff is liable only to the extent that the accident caused an aggravation to the pre-existing condition."

497 The crumbling skull doctrine does not apply in this case. Prior to the defendant's negligence, there was no pre-existing compartment syndrome in the plaintiff's right arm that was active, or likely to become active, to cause

damage to the plaintiff's right arm. The compartment syndrome started to develop after the defendant applied a full circumferential cast to the plaintiff's high impact injury.

498 Dr. Taylor recognized that by 2:00 p.m. the process of the developing compartment syndrome had become irreversible. He testified that, at 2:00 p.m. on November 13, 2005, when the cast was removed "what you're left with is that the compartment syndrome has progressed to the point where it requires surgical treatment. It's ... a true compartment syndrome, you have the self-perpetuating escalating process that goes on and it can only be stopped by surgical treatment and incising the fascia and reducing the pressure by increasing the volume of the muscles."

499 When the cast was removed it was no longer of any relevance as an aggravating factor as the evidence establishes that by that time, the damage by the cast had already been done. By then, the compartment syndrome was significant, established, and was irreversible.

500 It appears that the defence admissions confirm that the plaintiff has met the onus of proof for causation.

Dr. Richards' evidence

501 I accept Dr. Richards' evidence on causation. Adding Dr. Richards' evidence to the defence concessions makes proof of causation very clear.

502 Dr. Richards' opinion makes sense and is based upon the evidence. He relied upon the facts of the case as provided by the plaintiff, Dr. Tanzer's observations, and Dr. Orsini's surgical notes and records.

503 Dr. Richards testified that a full circumferential cast applied to the plaintiff's injury on a balance of probabilities caused the development of compartment syndrome. The underlying injury results in swelling within the muscle compartment that cannot be accommodated by the rigid plaster cast. The cast applies pressure to the muscles of the compartment, which in turn causes increased swelling.

504 The plaintiff in this case had swelling at the time of the injury, as documented by the paramedic and the defendant's "+ swollen." After the partially successful closed reduction, the lunate facet was located in the joint and further swelling was to be anticipated.

505 The plaintiff experienced pain and significant swelling after the cast was applied. He was unable to feel the cast when he left the hospital, as there was too much pain. The plaintiff complained of numbness, tingling, and significant pain; these symptoms did not subside after the reduction and cast application. The plaintiff was "alarmed" about his symptoms. The defendant told him that pain and swelling were normal for two to three days.

506 Before discharge from Scarborough General the plaintiff was exhibiting significant symptoms of pain, swelling, and loss of sensation consistent with the risk of developing compartment syndrome.

507 Dr. Tanzer recognized and made the working diagnosis immediately that the plaintiff had compartment syndrome when he saw him. His eyes lit up when he saw the full cast. For reasons I have outlined, I accept this evidence. He hoped that by splitting what he observed to be a tight cast, the muscles in the compartment could recover their blood supply and the process of the developing compartment syndrome would stop.

508 Unfortunately, in the plaintiff's case by the time the cast was removed shortly after 1:44 p.m. on November 13, 2005, the compartment syndrome had become irreversible. The pain and swelling did not abate. The cast had to be split, but splitting the cast could not retard the process. The only remedy was a fasciotomy. Dr. Tanzer called Dr. Orsini to report the plaintiff's compartment syndrome requiring urgent care.

509 I accept Dr. Richards' evidence that a full circumferential cast can cause the development of compartment syndrome when applied to a high impact injury, as the anticipated swelling cannot be accommodated.

510 I accept Dr. Richards' evidence that "I think the likelihood is that if he [the plaintiff] had the fracture and no treatment at all, he would probably not have got the compartment syndrome, but [would have] had a crooked arm." I also accept his evidence that, "if [the plaintiff] had had the fracture and the fracture reduced and put in a splint or a bivalved cast, he probably wouldn't have got the compartment syndrome."

511 I accept Dr. Richards' evidence expressed in simple words that, on a balance of probabilities based on the facts of this case, but for the application of a full circumferential cast to the plaintiff's high impact injury, the compartment syndrome would not have developed.

512 For these reasons, I find that the plaintiff has met the onus of proof of causation applying the "but for" test to the facts of this case.

Summary of Conclusions

Admissibility of Dr. Orsini's medical report

513 I ruled at the commencement of the trial that the content of Dr. Orsini's reports outlining the facts and his observations were admissible for their truth. Both parties relied on this factual content throughout the trial. This factual content supplements the hospital records admitted into evidence, and they appear to be admissible under s. 52 of the *Evidence Act*. The defence did not object to this ruling, and reflects their alternative argument on the preliminary motion.

514 I ruled that Dr. Orsini's opinions on negligence and causation expressed in his reports were not admissible for their truth as necessity had not been met. Dr. Orsini was not available for cross-examination. The plaintiff had another qualified expert, Dr. Richards, available to testify on negligence and causation.

515 The various expert reports comment on Dr. Orsini's opinion, as well as his surgical notes and observations. I concluded that Dr. Orsini's opinions on negligence and causation expressed in his reports are admissible as part of the *res gestae* and background, but not for their truth.

Scope of admissible evidence of treating emergency room physicians

516 I concluded that Dr. Tanzer as the treating emergency room physician must be able to give evidence about the steps he took, his observations, and his diagnosis at the time. His observations that the cast was tight and therefore he split the cast are admissible facts for their truth. His working diagnosis of compartment syndrome is an admissible fact.

517 Dr. Richards relies on Dr. Tanzer's observations and actions as reflected in Dr. Orsini's notes as some of the facts underpinning his opinion on causation.

518 Dr. Tanzer did not serve a report pursuant to Rule 53.03 of the *Rules of Civil Procedure*. Therefore, he cannot testify directly on issues of standard of care or causation: *Westerhof*.

Whether it is appropriate for counsel to review experts' draft reports

519 Defence counsel reviewed Dr. Taylor's draft report during a one-and-a-half-hour telephone conference call.

520 The purpose of Rule 53.03 of the *Rules of Civil Procedure* is to ensure the independence and integrity of the expert witness. The expert's primary duty is to the court. In light of this change in the role of the expert witness under the new rule, I conclude that counsel's practice of reviewing draft reports should stop. There should be full disclosure in writing of any changes to an expert's final report as a result of counsel's corrections, suggestions, or clarifications, to ensure transparency in the process and to ensure that the expert witness is neutral.

Defence objections limiting the scope of the plaintiff's expert evidence

521 Defence counsel took a restrictive view of Rule 53.03 of the *Rules of Civil Procedure* objecting to all evidence not specifically covered in Dr. Richards' report. I do not accept defence counsel's approach as the proper or intended interpretation of Rule 53.03. Defence counsel limited the expert's testimony to what is directly contained in his report, even if the substance of the testimony was latent in the report. However, in light of plaintiff counsel's concession, Dr. Richards' answers in chief were limited to the content of his reports. He was not permitted to comment on trial evidence, or any issues arising from the evidence, unless they were referred to in his reports.

522 I note that defence counsel did not follow the same set of strict rules when questioning her experts. I allowed the expanded questioning of the defence experts with respect to the evidence in this case, notwithstanding the defence counsel's rigid approach limiting Dr. Richards' evidence.

523 It would have been helpful to me as the trier of fact to have counsel present to each of the expert witnesses the agreed upon and the disputed facts, to fairly test whether the facts of the case impact upon their opinions contained in their expert reports. In light of the defence objections, this approach was not taken.

524 As well, defence counsel objected to the written reports being admitted for their truth into evidence. Copies of the reports were available to me as an aide to assist in following the evidence, but not admitted into evidence. The oral evidence was not necessarily as clear as the experts' written reports. This made my task of fairly summarizing each expert's evidence more challenging.

525 In light of the defence submissions, I have not considered the experts' reports for their truth. However, I conclude that the common law rule, that an expert has the option of filing his report or testifying at the trial, does not make practical sense after the amendments to Rule 53.03 of the *Rules of Civil Procedure*. I suggest that experts should be entitled to rely upon their written reports as part of their evidence-in-chief. This approach would both streamline the trial process and assist the trier of fact in understanding and assessing expert evidence. This is a matter for a higher court, or the Civil Rules Committee.

Standard of Care

526 I have concluded that the defendant did not meet the standard of care of a reasonably prudent general orthopedic surgeon in 2005 in a community hospital in Ontario in applying a full circumferential cast in the facts of this case. I accept Dr. Richards' evidence on this issue, and do not accept the evidence of the defence experts.

527 To meet the standard of care, the defendant should have applied either a splint or a bivalved cast cut to the skin.

528 Before discharging the plaintiff, the defendant failed to adequately educate or warn the plaintiff of the risk of developing compartment syndrome, and he treated this injury as routine. He did not meet the standard of care of an orthopedic surgeon in a community hospital in 2005 by failing to adequately educate the plaintiff about the risks and symptoms of compartment syndrome. In spite of this omission, the plaintiff attended at the hospital the next day. Therefore, this omission did not impact the issue of causation.

Causation

529 The plaintiff bears the onus of proof on a balance of probabilities to show that the closed circumferential cast in this case caused the compartment syndrome to develop, applying the legal test for causation.

530 The defence experts' admissions that the cast aggravated, or exacerbated, the underlying injury and the development of compartment syndrome appear to support the conclusion that causation has been proved.

531 I accept Dr. Richards' evidence that a full circumferential cast can cause the development of compartment syndrome when applied to a high impact injury, as the anticipated swelling cannot be accommodated.

532 Further, I accept Dr. Richards' evidence expressed in simple words that, on a balance of probabilities based on the facts of this case, but for the application of a full circumferential cast to the plaintiff's high impact injury the compartment syndrome would not have developed.

533 I find that the plaintiff has met the onus of proof of causation in the facts of this case.

Costs

534 If the parties are unable to agree on appropriate costs, the parties may file written submissions within 30 days of the release of these reasons. The plaintiff shall file a consolidated brief containing the submissions of both parties.

J.M. WILSON J.

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- 1** (Paper presented at the Superior Court of Justice (Ontario) Fall Education Seminar, 31 October 2013) [unpublished].
 - 2** "In the Opinion of the Treating Doctor: Adducing Opinion Evidence from Fact Witness Physicians" (2013) 32 Advocates' Soc. J. 14.
 - 3** In developing this list of criteria, I was guided by the comments made by Justice George Strathy in his presentation delivered at the Superior Court of Justice (Ontario) Fall Education Seminar, 31 October 2013, "Dealing with Expert Qualifications, the Scope of the Expert's Testimony and the Bias of the Expert".
 - 4** M.M. McQueen, P. Gaston, & C.M. Court-Brown, "Acute Compartment Syndrome. Who is at Risk?" (1999) 82 The Journal of Bone & Joint Surgery 200 at 202.
 - 5** N.S. Simpson & J.B. Jupiter, "Delayed onset of forearm compartment syndrome: a complication of distal radius fracture in young adults" (1995) 9 Journal of Orthopedic Trauma 411.
 - 6** "Complications of Distal Radius Fractures" (2007) 38 Orthopedic Clinics of North America 217.
 - 7** *Ibid*, at 87.
 - 8** McQueen, Gaston, & Court-Brown, *supra* note 4, at 200.
 - 9** *Ibid*, at 202.
 - 10** Simpson & Jupiter, *supra* note 5.
 - 11** Athwal, Turner, & Faber, *supra* note 6.
 - 12** Bucholz & Heckman, eds., 5th ed. (Philadelphia: Lippincott Williams & Wilkins, 2001).
 - 13** Simpson & Jupiter, *supra* note 5, at 417.