The Judicial Admission of Faulty Scientific Expert Evidence Informing Wrongful Convictions

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The Judicial Admission of Faulty Scientific Expert Evidence Informing Wrongful Convictions

Abstract
The failure of a judge to properly conduct a *voir dire* to ensure an expert is sufficiently qualified to give evidence in a particular area may give rise to a wrongful conviction. Considering Recommendation 130 from the Goudge Inquiry, that “trial judges should be vigilant in exercising their gatekeeping role with respect to the admissibility of [expert] evidence”, it is essential to examine recent shortcomings of judicial vigilance in admitting expert evidence and to consider how to remedy similar errors in future cases.

The major shortcoming of judicial gatekeepers in admitting expert evidence is the improper application of case law regarding the test in *R v Mohan* and consideration of the factors in *Daubert*. Systemic patterns of judicial error are demonstrated through the repeated admission of expert evidence given by Doctors Charles Smith and Gideon Koren. By analyzing the flaws in Dr. Smith’s admitted testimony in the context of the *Mohan* test, and the misapplication of the *Daubert* factors to Dr. Koren’s evidence, it is clear that the gatekeeper’s acceptance of unqualified or underqualified expert evidence can be avoided by holding fulsome *voire dires* and adopting techniques utilized in other jurisdictions to reduce the potential of wrongful convictions.

Keywords
wrongful convictions, judicial gatekeeper, gatekeeper, Mohan, Daubert, evidence, admissibility, expert evidence, Goudge Inquiry

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THE JUDICIAL ADMISSION OF FLAWED EXPERT OPINION EVIDENCE INFORMING WRONGFUL CONVICTIONS

Alexandra Derwin*

INTRODUCTION

Trial judges function as the gatekeepers of evidence. In discharging this role, they determine whether evidence may be admitted into court and considered by the trier of fact. The gatekeeping function of trial judges is an integral feature of our justice system and is particularly important in the realm of expert opinion evidence. As the outcomes of criminal trials increasingly rely on complex forensic science, expert opinion evidence has come to play a vital role in the administration of justice.

In some cases, the misapplication of the relevant legal tests can lead to the inappropriate admission of expert opinion evidence. The outcomes of the *R v Broomfield*¹ and *R v Mullins-Johnson*² trials provide live examples of this problem. The wrongful convictions that occurred in these trials appear to have been largely informed by the flawed opinion evidence provided by Dr. Charles Smith and Dr. Gideon Koren.

This paper will explore the issue of flawed expert opinion evidence informing wrongful convictions in three parts. First, it will consider the relevant legal tests that govern the admissibility of expert opinion evidence. Second, this paper will attempt to explain how the wrongful convictions that resulted from the *Mullins-Johnson* and *Broomfield* trials might have been avoided had these legal tests been rigorously applied. Finally, this paper will end by considering some of the procedural practices employed in other common law jurisdictions to mitigate against admission of flawed expert opinion evidence. In short, this paper aims to demonstrate that wrongful convictions that arise from flawed expert opinion evidence may be prevented in Canada through rigorous application of the relevant legal tests and by incorporating practices from other jurisdictions into Canadian criminal procedure.

I. THE LAW GOVERNING THE ADMISSION OF EXPERT OPINION EVIDENCE

Opinion evidence is, as a general rule, inadmissible in a court of law. Witness testimony is typically limited to facts within the witness’s knowledge, observation, or

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¹ 2010 ONSC 3808 [*Broomfield*].

² The trial decision of this case is unreported. The Court of Appeal citation for this case is *R v M(W)*, 31 OR (3d) 660 [*R v M(W)*].
experience. However, expert opinion evidence is an exception to this general exclusionary rule. An expert’s opinion may be required to assist the trier-of-fact in forming a correct judgment on a fact in issue that is beyond the scope of knowledge of an ordinary person. In other words, expert opinion may provide the trier of fact with a “ready-made inference” that they would otherwise be unable to form given the technical nature of the subject matter.

Procedurally, a trial judge must hold a voir dire to determine the admissibility of expert opinion evidence. This is done to ensure that an individual proffered as an expert in a particular area has legitimate qualifications and expertise applicable to the case at hand. The determination of the admissibility of expert opinion evidence at the voir dire is completed by conducting an analysis known as the Mohan test. This test was established by the Supreme Court of Canada in R v Mohan. The Mohan test requires the trial judge to scrutinize the proffered expert opinion evidence based on four criteria assessed on a balance of probabilities:

(a) the relevance of the expert opinion to a fact-in-issue;
(b) the necessity of the expert opinion in assisting the trier of fact;
(c) the absence of any exclusionary rule; and
(d) whether the witness is a properly qualified expert.

First, relevance is a threshold requirement decided by a judge as a question of law. Typically, evidence is considered relevant if it is “so related to a fact in issue that it tends to establish it.” However, the Mohan test requires further inquiry into the relevance of the proffered expert opinion evidence than is typically required. In particular, the Mohan test requires trial judges to consider whether the prejudicial effect of the evidence outweighs its probative value. If this is the case, evidence that is “logically relevant” could be misused, distort fact-finding, or confuse a jury. Expert evidence has the potential to distort the fact-finding process by using scientific language unfamiliar to the judge or jury that may be accepted as infallible or having more weight than it
It is for these reasons that the Mohan test requires greater scrutiny of the relevance of expert opinion evidence.

Under the second factor of the Mohan test, the trial judge will consider the necessity of the expert opinion evidence. The expert opinion should be admitted if the inference proffered by the expert is necessary for the trier of fact to receive information outside of their own experience and knowledge. Here again, any expert testimony must be assessed based on its ability to distort the fact-finding process.

Third, the expert opinion may be excluded if it is subject to another exclusionary rule. For example, there are exclusionary rules that prohibit hearsay, illegally obtained evidence, and character evidence in various circumstances.

Finally, the expert must be properly qualified. That is, the expert must be a person “who is shown to have acquired special or peculiar knowledge through study or experience in respect of the matters on which he or she undertakes to testify.” R v Igor Kresco illustrates how this factor of the Mohan test works in practice. In this case, a detective provided a court with expert opinion evidence on accident reconstruction and vehicle speed analysis. The court examined the officer’s background, work experience, and training in the particular area of collision reconstruction. Notably, in holding that the officer was a qualified expert, the court affirmed that expert skills may be “derived from specific studies or practical training.”

If the expert opinion evidence meets the criteria set out in the Mohan test, the trial judge must then make a determination with respect to the threshold reliability of the evidence. The proffered evidence will meet the threshold of reliability if it is “essential in the sense that the trier of fact will be unable to come to a satisfactory conclusion without the assistance of the expert.”

In the context of scientific evidence, the trial judge will employ the “reliable foundation test” to determine the threshold reliability of the evidence. This test was formulated by the Supreme Court of the United States in Daubert v Merrell-Dow Pharmaceuticals Inc. and later endorsed by the Supreme Court of Canada in R v J-L.J. The reliable foundation test, otherwise known as the Daubert factors, outlines criteria for

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13 Ibid at para 23.
14 Ibid at para 26.
15 Ibid at para 27.
16 Ibid at para 30.
17 Ibid at para 31.
18 2012 ONSC 4548.
19 Ibid at para 8.
20 Ibid at para 6.
21 Mohan, supra note 7 at para 32.
22 509 US 579 (1993) [Daubert].
23 2000 SCC 51.
determining whether a scientific theory or technique is reliable. Pursuant to this test, a trial judge is asked to consider

(1) whether the theory or technique has been tested and found subject to falsification;

(2) whether it has been subject to peer review and publication;

(3) its known or potential error rate and the existence and maintenance of standards controlling its operation; and

(4) whether the theory or technique has general acceptance within the relevant scientific community.\textsuperscript{24}

In the case of novel scientific expert evidence, the threshold of reliability should be applied particularly stringently to accommodate the constantly evolving nature of science.\textsuperscript{25}

In \textit{R v Abbey},\textsuperscript{26} the Ontario Court of Appeal built on the \textit{Mohan} test by suggesting a two-part test for determining the admissibility of expert opinion evidence.\textsuperscript{27} Under the first step, the “party proffering the evidence must demonstrate the existence of certain preconditions to the admissibility of expert evidence.”\textsuperscript{28} In other words, the party proffering the evidence must satisfy the trial judge that the evidence passes the \textit{Mohan} test. If this is the case, then at the second step the trial judge must consider whether the expert opinion evidence is sufficiently beneficial to the trial process despite the potential harm that may flow from its admission.\textsuperscript{29} That is, the trial judge must weigh the strength or cogency of the expert opinion against its potential prejudice or “costs” to ensure that the admission of the evidence does not distort the fact-finding process. The costs associated with the admission of the expert opinion could include its use by the trier of fact for an impermissible purpose or the possibility it could confuse or mislead the trier of fact.\textsuperscript{30} The second step is referred to as the “gatekeeping” component and requires the use of judicial discretion.

The current leading case on the admissibility of expert opinion evidence is \textit{White Burgess Langille Inman v Abbott and Haliburton Co.}\textsuperscript{31} This case further develops the standard set out in \textit{Abbey} by adding four considerations to the second stage of the cost-benefit analysis. At this stage, the trial judge may consider concerns regarding the

\textsuperscript{24} Daubert, \textit{supra} note 22 at 584.
\textsuperscript{25} Ontario, Ministry of the Attorney General, \textit{Inquiry into Pediatric Forensic Pathology in Ontario: The Role of the Court}, vol 3 (Toronto: Queen’s Printer for Ontario, 2008) at 487 [Inquiry vol 3].
\textsuperscript{26} 2009 ONCA 624.
\textsuperscript{27} \textit{Ibid} at para 76.
\textsuperscript{28} \textit{Ibid}.
\textsuperscript{29} \textit{Ibid}.
\textsuperscript{30} \textit{The Law of Evidence, supra} note 3 at 814.
\textsuperscript{31} 2015 SCC 23 [\textit{White Burgess}].
impartiality of the expert testimony by assessing “relevance, necessity, reliability, and absence of bias.” Should the court determine that an expert is not independent or impartial, this finding goes to the admissibility of the evidence and the weight given to it if it is admitted. Though White Burgess sets out the most recent test governing the admissibility of expert opinion evidence, the Mohan test remains a crucial component of this broader test.

In summary, the law provides judges with various tools to assist them in performing their gatekeeping function with respect to expert opinion evidence. In the voir dire, a judge is armed with the tests from Mohan and Daubert to determine the admissibility of the evidence. Judges must also engage in a final balancing of the benefits of admitting the evidence with the potential risks associated with its admission. When applied correctly, this analysis can weed out expert opinions that are either incorrect or outside the scope of an expert’s expertise. A complete and vigorous analysis is vital, given that the admission of faulty evidence may result in wrongful convictions.

II. CASE STUDIES ON THE ADMISSION OF FAULTY EXPERT EVIDENCE

The law canvassed in the previous section is not always stringently applied. The Mullins-Johnson and Broomfield cases both illustrate how trial judges can be fallible to admitting flawed expert opinion evidence. Notably, the Mullins-Johnson trial occurred before the Supreme Court formally outlined the requirements of a “properly qualified expert” in Mohan and before the Supreme Court endorsed the Daubert factors. However, the Mullins-Johnson case still provides an illustrative example of the importance of scrutinizing expert opinion evidence using all available legal tools. In contrast, the Daubert factors were well-established at the time of the Broomfield trial, but it does not appear that they were rigorously applied in this case. Both of these cases, therefore, serve to demonstrate the importance of proper application of the applicable law governing the admission of expert opinion evidence.

Dr. Charles Smith (Expert Witness in R v Mullins-Johnson)

Qualifications

Dr. Charles Smith was a pediatric pathologist with no formal training or education in forensic pathology. Despite this, he was appointed as the Director of the Ontario Pediatric Forensic Pathology Unit (OPFPU), where he became Ontario’s leading expert in pediatric forensic pathology. Dr. Smith himself confessed that his qualifications were

32 Ibid at para 54.
33 Ibid at para 45.
34 Ontario, Ministry of the Attorney General, Inquiry into Pediatric Forensic Pathology in Ontario, vol 2 (Toronto: Queen’s Printer of Ontario, 2008) at 117 [Inquiry vol 2].
“woefully inadequate” and that this contributed substantially to his errors.35 The gap between Dr. Smith’s actual and professed qualifications may be attributed to the lack of speciality training and qualifications for forensic pathology in Canada during the 1990s. This forced Canadian forensic pathologists to be self-taught, to engage in self-directed informal training, and in some cases to seek formal training in the United States or the United Kingdom.36

During Dr. Smith’s medical residency and fellowship, he performed some autopsies; however, few were performed in a criminal context.37 This lack of exposure to criminal autopsies proved to be a serious limitation to his professed expertise as a forensic pathologist. After the completion of his training, he began performing more autopsies simply out of curiosity and without any formal forensic pathology education.38 By the 1990s, the bulk of Dr. Smith’s work involved forensic pathology, despite the fact that he lacked any credible forensic pathology training. He began lecturing on the role of forensic pathology as it relates to the criminal justice system and became well known in the justice system through his speaking engagements at Crown and police training sessions.39 Dr. Smith became widely regarded in Ontario as the authority for pediatric forensic pathology based on his seemingly stellar reputation and his appointment as director of the OPFPU.40

Though the Mullins-Johnson trial occurred the year before the Supreme Court of Canada established the Mohan test, this case provides an instructive example of the importance of the gatekeeping role of judges. It is possible that Dr. Smith’s problematic testimony would have been excluded, had the Mohan test and the Daubert factors existed in Canadian law and been properly applied during the Mullins-Johnson trial.

R v Mullins-Johnson

Dr. Smith was consulted for a second opinion in 1993 regarding a sexual assault case.41 Due to his lack of training, Dr. Smith was unaware that normal post-mortem changes in a body can include neck bruising and dilation of the anus.42 The presence of these two elements formed the basis upon which Dr. Smith established the incorrect belief that the victim was strangled and sexually assaulted.43 Due to Dr. Smith’s testimony and a lack of adequate instructions to the jury on the role of expert evidence, William Mullins-Johnson was wrongfully convicted and spent over twelve years in prison.44

35 Ibid at 119.
36 Ibid at 117.
37 Ibid at 118–19.
38 Ibid.
39 Ibid.
40 Ibid at 119.
41 Ibid at 120.
42 Ibid.
43 Ibid.
44 Ibid.
Of the five doctors who testified in the trial, Dr. Smith was the only one who said that the victim had been sexually assaulted within 45 minutes of death. He provided this testimony despite only having reviewed photographs of the victim’s condition post-mortem.\textsuperscript{45} Dr. Smith also asserted that the victim had died of asphyxia, while another doctor claimed that it was likely a “mechanical obstruction to the nose or mouth, or neck or upper chest” had caused the victim’s death.\textsuperscript{46} The contrast between Dr. Smith’s testimony and the testimony provided by other doctors was stark.

It seems possible that the wrongful conviction of Mullins-Johnson could have been avoided had the \textit{Mohan} test existed at the time and been properly applied. Generally speaking, Dr. Smith ventured beyond his realm of expertise by testifying about matters he was unqualified to address and by speculating about matters not supported by existing evidence in the field of forensic pathology.\textsuperscript{47} The trial judge was unsuccessful in recognizing these errors during Dr. Smith’s testimony. Since the time of the \textit{Mullins-Johnson} trial, the \textit{Mohan} test, when properly applied, has served to prevent such problematic testimony from being admitted into court.

Dr. Smith’s evidence would likely have met the first three requirements of the \textit{Mohan} test. The evidence he provided was relevant, necessary, and would not have been excluded by another exclusionary rule. The contested prong of the \textit{Mohan} test is whether Dr. Smith was properly qualified to give the expert opinion evidence that he provided.

With respect to this prong of the \textit{Mohan} test, it appears quite clear that Dr. Smith lacked the required special “knowledge through study or experience.”\textsuperscript{48} It was later recognized that certain elements of the victim’s death, such as assault, were elements that Dr. Smith was not familiar with, since he “had never before been involved in a post-mortem examination of a sexually abused child.”\textsuperscript{49} Furthermore, Dr. Smith had no experience determining post-mortem changes in bodies, nor did he have knowledge of what evidence of sexual assault post-mortem looked like. It is therefore unsurprising that his testimony was inaccurate, since he was not properly qualified in the relevant area of pathology. Though it is uncommon for experts to lie and exaggerate about their expertise, in this circumstance, lawyers and judges alike failed to expose Dr. Smith’s lack of proper qualifications. To prevent similar instances of experts providing testimony that is beyond the scope of their expertise, it is vital that judges properly apply the \textit{Mohan} test, which has since been developed, and not defer to the professional judgment of so-called experts. In fact, Recommendation 129 of the Goudge Inquiry suggests that “the court should clearly define the subject area of a witness’s expertise and vigorously confine the

\textsuperscript{45} \textit{R v M(W)}, \textit{supra} note 2 at para 25.

\textsuperscript{46} \textit{Ibid} at para 27.

\textsuperscript{47} \textit{Inquiry} vol 3, \textit{supra} note 25 at 472.

\textsuperscript{48} \textit{Mohan}, \textit{supra} note 7 at 27.

\textsuperscript{49} \textit{Inquiry} vol 2, \textit{supra} note 34 at 120.
witness’s testimony to it.” \(^{50}\) The court had the potential to confine Dr. Smith’s testimony to areas in which he was an expert, such as pediatric pathology. It is possible that judicial narrowing of Dr. Smith’s testimony, based on his shortcomings as an expert in the particular circumstances of the case, may have prevented him from testifying about issues outside his scope of training.

Though the *Daubert* factors had not yet been incorporated into Canadian law at the time of the *Mullins-Johnson* trial, had these factors been properly applied, they likely would have also called for exclusion of Dr. Smith’s testimony. Recall that this test requires the court to assess the reliability of expert evidence based on whether a technique has been tested, has been peer reviewed, has published error rates and standards, and has general acceptance within the scientific community. \(^{51}\)

The *Daubert* factors would have required the judge to inquire whether or not Dr. Smith’s conclusion about the victim’s head injury as the cause of death was based on scientific standards. During his testimony, Dr. Smith reasoned that “in the absence of a credible explanation […] the post-mortem findings are regarded as resulting from non-accidental injury.” \(^{52}\) This reasoning is non-scientific because it puts the onus on other experts to exclude Dr. Smith’s findings of “non accidental injury.” \(^{53}\) It is clear that Dr. Smith’s findings were not based on tests, peer reviewed procedures, or a general acceptance of the scientific community, as is required by the *Daubert* factors. Rather, his expert opinion was simply based on his inability to find any “credible explanation.” \(^{54}\) Pure speculation about the cause of death based on a lack of information cannot withstand the reliable foundation test, and it would have been excluded if the trial judge had properly applied the test. Since the finding of guilt appears to have hinged largely on Dr. Smith’s opinion, it is possible that exclusion of this evidence would have left the trier of fact with a reasonable doubt about whether Mullins-Johnson had committed the alleged act.

The role of the gatekeeper judge now requires a thorough analysis of expert opinion evidence through the legal tests established by *Mohan* and *Daubert*. It is possible that Dr. Smith’s problematic testimony would have been excluded if these tests had been available to the trial judge during the *Mullins-Johnson* trial. This could have prevented the wrongful conviction of Williams Mullins-Johnson.

**Dr. Gideon Koren (Expert Witness in *R v Broomfield*)**

Dr. Gideon Koren served as the former head of Motherisk Drug Testing Laboratory. He was a clinical toxicologist who lacked formal training in forensic

\(^{50}\) Inquiry vol 3, *supra* note 25 at 475.

\(^{51}\) *Daubert*, *supra* note 22 at 593–4.

\(^{52}\) Inquiry vol 2, *supra* note 34 at 157.

\(^{53}\) Ibid at 157.

\(^{54}\) Ibid at 216.
toxicology and used hair-analysis techniques in an unaccredited lab.\textsuperscript{55} He testified as a forensic expert in a multitude of criminal and family matters. It has since been acknowledged that unreliable hair-strand analysis technique for drug and alcohol testing led to 16,000 questionable child apprehensions and at least six criminal wrongful convictions.\textsuperscript{56} In hindsight, Dr. Koren’s hair-strand tests were inadequate for forensic purposes and should not have been admitted in court. The admission of expert evidence based on an unreliable scientific technique signals an inadequacy in the application of the \textit{Daubert} factors by the trial judge.

\textit{Qualifications and Hair-Strand Analysis Technique}

In 1985, Dr. Koren founded the Motherisk program at Toronto’s Hospital for Sick Children. The aim of this program was to provide counselling and care for women who take illicit substances during their pregnancy.\textsuperscript{57} Dr. Koren was well-respected within the scientific community; he won a Career Scientist Award from the Ontario Ministry of Health and became recognized as an international expert in pharmacology and toxicology.\textsuperscript{58} Shortly thereafter, he was appointed Chair in Molecular Toxicology at Western University. In this role he oversaw a national program in human toxicology. It appears that Dr. Koren’s positions and professional accolades made it difficult for judges to believe he was unqualified in the field of forensic pathology. The Motherisk lab closed after the Goudge Inquiry shed light on Dr. Koren and Motherisk’s missteps. In Ontario, where the Motherisk Drug Testing Lab (MDTL) was located, accreditation was not a requirement for laboratories providing forensic services if they “adhere[d] to internationally recognized forensic standards.”\textsuperscript{59} MDTL was never accredited as a forensic laboratory despite the fact that many organizations within Canada were capable of making this determination. Though not required, the lack of accreditation meant that no external body had the opportunity to assess the procedures of MDTL.\textsuperscript{60} In 2011 and 2014, MDTL was clinically accredited. Despite this, no body evaluated its compliance with forensic standards; this still left the lab’s reliability with respect to forensic testing open to question.\textsuperscript{61} Judges were not thorough in questioning Dr. Koren about the accreditation and limitations of the methods of the MDTL lab. Notably, they allowed “no

\textsuperscript{55} Inquiry vol 3, \textit{supra} note 25 at 289 and 360.
\textsuperscript{58} “Gideon Koren”, \textit{Upclosed}, online: <https://upclosed.com/people/gideon-koren/>.
\textsuperscript{60} \textit{Ibid} at 180.
\textsuperscript{61} \textit{Ibid} at 183–4.
evidence... adduced at trial to challenge the methodology” at issue.62 In fact, his testimony was viewed by judges at the time as “compelling” and “unshaken.”63

Judicial acceptance of Dr. Koren’s hair-strand analysis methods led to the apprehension of thousands of children from their families and to multiple criminal charges being laid based on an inaccurate scientific foundation.64 Some of these charges led to wrongful convictions.65 One of the first uses of Dr. Koren’s testimony and faulty hair-strand analysis resulted in a wrongful conviction in the Broomfield trial.

R v Broomfield

In 2005, Tamara Broomfield brought her child into the SickKids hospital after the child experienced seizures. During the testing that followed, MDTL used hair-strand analysis to determine that the child had ingested “substantial amounts” of cocaine within the fourteen months prior to the testing.66 This evidence was accepted by the trial judge, and Broomfield was subsequently convicted of several offences, including administering a noxious substance to a child, assault causing bodily harm, failing to provide the necessities of life, and aggravated assault.67 Her cocaine-related convictions were later overturned by the Court of Appeal, which acknowledged the genuine controversy surrounding the hair-strand analysis that MDTL employed.68 Since Broomfield had already served a 49-month sentence, no new trial was ordered in the interest of justice.69

The Daubert factors clearly indicate that Dr. Koren’s scientific methods were not reliable. The judge appears to have accepted exaggerations made by Dr. Koren with respect to the trustworthiness of hair-strand analysis. In particular, the trial judge did not adequately assess the whether the hair-strand analysis had been tested and subject to falsification, whether it had general acceptance within the scientific community, and whether there were clear standards controlling its technique.

First, with respect to the testing of Dr. Koren’s techniques, it appears that in the Broomfield trial, Dr. Koren’s expert opinion evidence was admitted based on the misunderstanding that his evidence had been accepted in criminal proceedings in other jurisdictions and subject to appropriate scrutiny in other cases. During the voir dire, the trial judge was informed that Dr. Koren’s expertise had been accepted in both Canadian

62 Ibid at 227.
63 Ibid at 225.
65 Motherisk Independent Review, supra note 59 at 239.
66 Ibid at 22–3.
68 Ibid at para 12.
courts and by a court in Colorado. However, news sources were unable to find a Colorado criminal proceeding where Motherisk’s evidence had been accepted. A court in Colorado had, in fact, deemed Dr. Koren’s evidence inadmissible due to its lack of general acceptance, testing, peer review, and controlling standards. Deliberate attempts by Dr. Koren to mislead the courts about the acceptance of his techniques could have been mitigated by further inquiries into which specific court had accepted the hair-strand analysis, and for what specific purpose.

Second, Dr. Koren’s evidence fell short of the standard of general acceptance within the scientific community. Though judges presume that an expert “know[s] his or her professional limitations,” Dr. Koren did not recognize or acknowledge the limitations of his technique. Motherisk’s technique of not washing hair samples prior to analysis was inconsistent with internationally recognized standards; however, Dr. Koren framed Motherisk’s technique as being widely accepted. The trial judge could have engaged in questioning based on the Daubert factors, which may have uncovered the shortcomings of Dr. Koren’s expert evidence in this respect. For instance, requesting other experts to speak on MDTL’s techniques regarding their peer review, error rate, and general acceptance may have mitigated the admissibility of Dr. Koren’s evidence or diminished its weight at trial. Unfortunately, “no evidence was adduced at trial to challenge the methodology used by the Crown’s expert,” which led to the trial judge admitting the expert evidence based on a lack of awareness about the controversial techniques.

To assist in determining whether Dr. Koren’s evidence was generally accepted, the trial judge could have requested corroborating evidence about whether hair-analysis technique of MDTL had been accepted by other forensic experts. This would have minimally affected the financial resources and time pressures of the criminal justice system.

Finally, the trial judge should have been more critical of the standards controlling the operation of MDTL’s hair-strand analysis and its known error rates. No evidence was adduced at trial to challenge the methodology used by Dr. Koren against Broomfield. The trial judge made her decision “unaware of the genuine controversy among the experts about the use of the testing methods relied upon by the Crown expert.” Between 2005 and 2015, MDTL hair-strand testing was determined to be inadequate, unreliable, and not

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71 Ibid.
72 Ibid.
73 Motherisk Independent Review, supra note 59 at 5.
75 Motherisk Independent Review, supra note 59 at 156–9.
76 Ibid at 108.
77 Ibid at 227.
78 Ibid.
in keeping with international forensic standards. Though Dr. Koren made deliberate attempts to mislead the trial judge about the acceptance of MDLT’s procedures by stating that MDTL “tests are used all over the world” and had “quality assurance protocols,” it is possible that more thorough questioning of Dr. Koren, or of a third party familiar with forensic standards, may have raised doubt about the hair-strand testing and prevented the hair-strand analysis from being admitted. For instance, the hair-strand testing kit itself had a specific caution about requiring a confirmation test. The fact that confirmation tests were rarely completed at MDTL should have raised flags with respect to the accuracy of the proffered hair-strand analysis. However, during the trial nobody engaged in questioning regarding the standards of the laboratory.

The Daubert factors were incorporated into Canadian law at the time of the Broomfield trial. A rigorous application of the Daubert factors would have revealed the shortcomings in Dr. Koren’s hair-strand analysis technique. Further inquiry into hair-strand analysis would have shown that Dr. Koren’s expert opinion evidence, based on hair-strand analysis, lacked general acceptance within the scientific community and clear standards controlling the technique. Had these deficiencies been uncovered, the evidence would likely have been inadmissible. Again, the wrongful conviction that resulted in this case illustrates that importance of judges rigorously applying the tools available to them to weed out flawed expert opinion evidence.

In response to the tragic wrongful convictions that occurred in the Mullins-Johnson and Broomfield trials, the reports of the Goudge Inquiry and the Motherisk Hair Analysis Independent Review provided suggestions on how to improve the judiciary’s ability to discharge its gatekeeping function. The majority of research generally focuses on the shortcomings of experts in properly articulating their expertise or in skewing the accuracy of their findings without adequately discussing the responsibilities of judges in preventing the admission of faulty expert evidence. Though lawyers and experts should be held to particular standards when it comes to submitting accurate information to the courts, the judge is the final gatekeeper who determines admissibility and must therefore rigorously apply the relevant legal tests.

### III. REMEDIES TO THE ADMISSION OF FLAWED EXPERT OPINION EVIDENCE

The risk of wrongful convictions based on faulty expert opinion evidence is not unique to Canadian jurisdictions. Canadian courts may adopt new methods to mitigate the admission of unreliable expert evidence by looking to the procedural practices employed in other common law jurisdictions. Some promising practices include the use

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79 Ibid at 4.
80 Ibid at 225.
81 Ibid at 88.
of court-appointed experts, jointly appointed experts, “hot tubbing,” and the use of recommendations for best practice. All of these techniques may aid judges in discharging their gatekeeping function by providing them with additional tools to weed out flawed expert opinion evidence. This, in turn, may have a direct impact on reducing wrongful convictions.

Court-Appointed Experts

In Canada, lawyers are free to choose experts based on their own discretion, typically without intervention from the courts. In contrast, in Sweden, court-appointed experts may be used to deter experts from misleading the court and feeling allegiance to either the prosecution or the defence. Though party-appointed experts may be used, research conducted in Sweden has indicated that the court-appointed experts have a greater perceived degree of trustworthiness. The Swedish general court, which handles criminal matters, utilizes court-appointed experts in approximately five per cent of cases.

Court-appointed experts in Sweden are examined and cross-examined at a pre-trial hearing in a way that is similar to the Canadian voir dire. The primary difference with Swedish court-appointed experts is that they have already been screened for relevant experience, competence, and reputation in the required field.

The adoption of court-appointed experts may overcome concerns associated with unqualified experts and faulty techniques by providing an enhanced screening mechanism. One issue that may arise from the use of court-appointed experts is that judges may place too much confidence in court-appointed expert’s testimony and qualifications. A study conducted by Eva Priis and Karsten Astrom indicates that judge’s attitudes toward party- and court-appointed experts are both generally positive, but that court-appointed experts are viewed by judges as generally more trustworthy. As such, court-appointed expert should be examined by courts with the same scrutiny and thoroughness as if the expert had been appointed jointly or by a single party.

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83 Ibid.
85 Friss, supra note 82.
**Jointly Appointed Experts**

Several other jurisdictions utilize jointly appointed experts. For example, Rule 35.7 of the United Kingdom’s Civil Procedure Rules allows parties to appoint a single joint expert to give evidence. The parties may choose the expert together, and if they are unable to agree, the court may appoint one.

In 1996, Lord Woolf produced *Access to Justice: Final Report* in which he advocated for widespread use of jointly appointed experts. He wrote that such an expert should be “concerned with a substantially established area of knowledge and [employed] where it is not necessary for the court to directly sample a range of options.” If parties decide that a jointly appointed expert is not appropriate, the parties and judge must indicate why not. This recommendation was affirmed in 2000 in the case *Daniels v Walker*, where the court stated that it “hoped that in the majority of cases” the appointment of a joint expert “will not only be the first step but the last step” in acquiring expert opinion evidence.

Following Lord Woolf’s recommendations, there was a dramatic rise in the use of jointly appointed experts between 1999 and 2001, from three to twelve instructions a year. In 2015, the use of jointly appointed experts dropped to eight per year from fifteen per year in 2005. Though their use is declining, jointly appointed experts may serve to reduce costs and increase access to justice for the parties involved. Justice Jackson affirmed the efficiency of jointly appointed experts in *Quarmby Electrical Limited v John Trant t/a Trant Construction* by stating that their appointment often “leads to the settlement of the whole litigation.” Additionally, the use of jointly appointed experts may serve to decrease the inclination of experts to align with a particular party, as well as to increase impartiality. Though these rules apply only to the civil context in the United Kingdom, the use of jointly appointed experts may serve to enhance the criminal justice

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89 Ibid at 137–52.
90 Ibid.
91 [2000] 1 WLR, 1382.
92 Ibid at para 28.
94 Ibid.
95 *Quarmby Electrical Limited v John Trant t/a Trant Construction*, [2005] EWHC 608 (TCC).
96 Ibid at para 55.
system reducing costs, increasing access to justice, and increasing the impartiality of experts.

Canada’s *Federal Court Rules* allow parties to jointly name an expert witness so long as all the parties consent. However, the BC *Supreme Court Civil Rules* amended this rule such that a judge may order a “jointly-instructed expert” in a case conference. This approach expands the functions of the judicial gatekeeper to include the potential appointment of experts. Though a jointly appointed expert may not fully assist in providing clarity on contentious issues, they may serve as a helpful tool for the trier of fact to hear a party-neutral expert’s opinion on scientific methods, techniques, or general information.

Again, the use of jointly appointed experts create some issues. The fact that the parties agree on one expert may promote a relaxed application of the *Mohan* and *Daubert*. It is possible that judges may not engage in a serious application of the relevant legal tests if both parties agree on the qualifications of the expert. However, it is likely that parties will only agree on an expert after having engaged in rigorous questioning and examination of the qualifications and positions of the expert. Therefore, the use of jointly appointed experts on the whole may serve to mitigate some existing shortcomings of party appointed experts.

**Hot Tubbing**

When multiple expert witnesses provide testimony in criminal proceedings, they typically testify consecutively. The judge will often hear all of the experts speak before making a decision about what evidence is admissible. In contrast, Australia utilizes a method known as hot tubbing, where experts are organized into a panel so that judges may hear their evidence concurrently. One at a time, the experts may provide their opinion on the fact in issue that is in question. Each expert may question the other experts to “narrow the issues in dispute between parties.”

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97 SOR 98-1-6.
98 Arnold, *supra* note 87.
99 *Court Rules Act*, BC Reg 168/2009 [BC *Supreme Court Civil Rules*].
100 *Ibid*, s 5-3(1)(k).
experts may serve to reduce misunderstandings of what the expert is trying to communicate. Afterwards, counsel may cross-examine any, all, or one of the experts.\textsuperscript{104} Hot tubbing is generally limited in Australia to civil proceedings, but it may be used in criminal trials before a judge alone, at a voir dire, or before magistrates, provided that both parties consent.\textsuperscript{105}

Experts have acknowledged that there are several benefits to hot tubbing. Hot tubbing allows experts to discuss the issues generally, express differences of opinion, question other experts, and narrow in on the key issues in dispute.\textsuperscript{106} These discussions serve the additional purpose of allowing the judge, lawyer, or listener to better understand what the experts are saying.\textsuperscript{107} This, in turn, could conserve court time and expenses by allowing those involved in the trial to process and understand the issues more quickly.\textsuperscript{108} These benefits overall serve to “reduce the chance of the first expert obfuscating in an answer” and allow co-experts to provide clarification on testimony when needed.\textsuperscript{109}

Hot tubbing is a unique solution, but it may also give rise to some issues. For example, experts may still be able to exaggerate the scope of their knowledge, and expertise and dominant personalities may take over the panel. Despite this drawback, hot tubbing has the potential to quickly reveal areas in which experts disagree, in addition to conserving court time by allowing lawyers to question multiple experts at once.

Hot tubbing has already been adopted as a practice in Canada in some contexts. Ontario and Quebec allow hot tubbing in the pretrial phase to settle key issues of debate.\textsuperscript{110} Rule 282.2 of the \textit{Federal Court Rules} allows for expert witnesses to “comment on the views of other panel members” and “pose questions to other panel members.”\textsuperscript{111} The \textit{Canada Evidence Act} allows a maximum of five witnesses for either party in any trial or other proceeding.\textsuperscript{112} Despite the fact that hot tubbing appears to be an acceptable practice in Canadian criminal proceedings, there are no records indicating its use in Canadian trials in practice. Especially in circumstances where multiple witnesses are used

\textsuperscript{104} van Rijn, \textit{supra} note 101.
\textsuperscript{107} Rares, \textit{supra} note 105 at para 4.
\textsuperscript{108} Brand, \textit{supra} note 106 at 105–6.
\textsuperscript{109} Rares, \textit{supra} note 105 at para 27.
\textsuperscript{111} \textit{Federal Court Rules}, SOR/98-106, s 282.2.
\textsuperscript{112} \textit{Canada Evidence Act}, RSC 1985, c C-5, s 7 [CEA].
in Canadian courts, the adoption of hot tubbing may benefit the court by conserving resources and prompting the questioning and admission of expert evidence with a critical eye.

**Recommendations for Best Practice**

In England and Wales, there are best practice recommendations that address a number of issues not addressed by Canadian procedure. These recommendations are provided by The Academy of Experts. This organization provides accreditation of expert witnesses as well as workshops for developing skills as an expert. These best practice recommendations, though not directly targeted at assisting the judge in their gatekeeping role, may assist in deterring experts from stretching facts, relying on untested methods, or testifying outside of the scope of their expertise.

One requirement in the best practice recommendations that exist in England and Wales is a Statement of Truth. This statement must be enclosed in an expert’s report. It affirms that the expert is “liable to the prosecution if [they] have willfully stated anything which [they] know to be false or… do not believe to be true.” The Statement of Truth ensures that an expert fully understands the duty they are undertaking when they submit their report to the court. It therefore serves to bolster the credibility of their testimony prior to taking the oath or affirmation in court. The Statement of Truth for civil matters outlines thirteen points that an expert must read prior to a report’s submission. These address bias, the exercise of reasonable care, and the role of the report in court. A similar, less comprehensive rule exists in Rule 11-2 of the British Columbia’s Supreme Court Rules, which provides that the expert must not be “an advocate for either party” and that all reports and testimony will be consistent with that duty. The BC Supreme Court Civil Rules are narrower than the broader Statement of Truth that exists in England and Wales, but they may serve as a reminder to experts and the judiciary about testimonial expectations.

Second, a Model Form of Report is a standardized form which outlines what written information experts must provide to the courts. Judges may review the written statements of experts to determine whether the information is expert and merit based, or whether it is contaminated with personal opinion. Having a written report may assist the judiciary in keeping experts accountable for prior statements, thereby preventing experts from providing exaggerated testimony and from speaking outside of the scope of their expertise.

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115 Ibid.
116 BC Supreme Court Civil Rules, supra note 99, s 38.05.
knowledge while on the stand. In Canada, the *Canada Evidence Act* states that a copy of the expert report should be given to the parties, or, if there is no report, that a “summary of the opinion anticipated to be given” should be provided, but it does not specify the requirements of the contents of the report.118 The judge may still review the report to ensure it is merit based, but the lack of formal requirements may prevent judges from coming to an informed decision with respect to the admissibility of expert testimony.

Finally, the Code of Practice for Experts explicitly outlines “minimum standards of practice that should be maintained by all Experts.”119 There is no equivalent type of code for experts testifying in Canada. The development of a comprehensive list of rules, requirements, and standards may assist experts when testifying, which would in turn bolster the quality of evidence and testimony and aid the judge in holding the expert to more explicit standards. In Canada, there is no national equivalent commissioned by the courts. In an attempt to better prepare members to provide expert testimony, some professions have created their own internal guidelines for use in court120

A possible danger that could arise from adopting similar standards in Canada might be that placing stringent requirements on experts would diminish the diligence of judges as additional protections to increase the reliability of expert evidence are put into effect. This danger is unlikely to hold much merit, since the requirements present in England and Wales help to ensure that both the expert and judge are aware of the requirements and expectations of providing expert opinion evidence. These standards enhance the role of the gatekeeper by providing clearer protections against the admission of improper expert opinion evidence.

**CONCLUSION**

The role of judges as the gatekeepers of evidence is one that is riddled with challenges. The wrongful convictions associated with Dr. Charles Smith and Dr. Gideon Koren illustrate why judges must examine expert opinion evidence, especially evidence derived from novel techniques, with a critical eye. Above all, it is crucial that judges properly apply the *Mohan* test and the *Daubert* factors. As the *Mullins-Johnson* and *Broomfield* cases demonstrate, these tests are important tools that can help to shed light on flawed expert opinion evidence. In addition to proper application of the appropriate legal tests, Canadian courts could be well served by looking to some of the procedural practices employed in other common law jurisdictions. It is possible that the adoption of

118 *CEA*, *supra* note 112 at 657.3(3)(b).
these methods could increase the reliability of expert opinion evidence and provide more safeguards against the admission of flawed expert opinion evidence. To reduce the possibility of wrongful convictions, judges must examine proposed expert evidence using all available laws, tools, and procedures permitted in court.