

**UNITED STATES DISTRICT COURT  
DISTRICT OF MINNESOTA**

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IN RE: NATIONAL HOCKEY LEAGUE )  
PLAYERS' CONCUSSION INJURY ) MDL No. 14-2551 (SRN/BRT)  
LITIGATION )  
\_\_\_\_\_)  
)  
This Document Relates to: )  
ALL ACTIONS )  
\_\_\_\_\_)

**PLAINTIFFS' MEMORANDUM OF LAW IN OPPOSITION TO  
DEFENDANT NATIONAL HOCKEY LEAGUE'S MOTION TO  
EXCLUDE THE TESTIMONY OF STEPHEN T. CASPER, PH.D.**

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## INTRODUCTION

Dr. Stephen T. Casper is an expert in the history of medicine. He is internationally recognized as an authority on the history of neurology specifically, and the mind and brain sciences generally. Dr. Casper created perhaps the most “comprehensive ... intellectual history on the subject [of head injury research] as has ever been undertaken by any historian or clinician for the modern, post-war, and contemporary period of medicine and science.” In total, he compiled and then drew upon a bibliography of over 1,000 medical sources related to the neurological effects of head injuries spanning the years 1871-2009. Dr. Casper read and relied on each to form his conclusions.

Over the course of his nearly 150 page report, Dr. Casper details and places in context the history of head injury knowledge, head injuries in sports, the specialization of concussion-based research in sports medicine, the nomenclature of head injury sequelae, and competing views as to complications caused by head injuries both within and outside of sports arenas. Informed by his detailed and thorough review, Dr. Casper proffered opinions on the long intellectual history of head injury research, including that the “historical record of science and medicine records the association between concussive and subconcussive blows to the head and the risk of negative, long term neurological effects since the nineteenth century.”

Despite Dr. Casper’s thorough review, the NHL seeks to have his opinion excluded. The NHL’s motion is premised on its belief that a historical analysis of medical knowledge should not be performed by a historian of medicine like Dr. Casper, but rather by a “scientist.” The NHL’s position is undermined by its own experts’ – all

supposedly qualified “scientists” – cavalier treatment of the historical record, where they repeatedly quote historical passages out-of-context to support their own conclusions. Contrast the NHL’s experts’ reports with Dr. Casper’s, and it is clear none of the NHL’s experts devote comparable time and effort to reviewing and recounting the historical record, and all lack the credentials and expertise to place evidence in historical context.

Dr. Casper’s methodology and attention to detail is unmatched by the NHL’s experts. Dr. Casper devotes significant space to detailing his methodology of selecting primary sources and materials, and choosing key terms and search words. In all, Dr. Casper spent an estimated 1,200 hours collecting and reviewing resources and forming his opinion. Each of the more than 1,000 sources Dr. Casper relied on are listed in his bibliography, and are available for any of the NHL’s experts to devote comparable time to reviewing.

Dr. Casper’s extensive effort bolsters the reliability of his report. Each of Dr. Casper’s conclusions is well-supported by the historical record, and the NHL’s allusions to the contrary are baseless. Dr. Casper’s qualifications and reliable methodology merit admission of his expert opinions.

### **BACKGROUND**

Stephen T. Casper is an expert in the history of medicine, neurology, and neuroscience. (Expert Rep. of Stephen T. Casper, Ph.D. (“Casper”) ¶¶ 1-9, Dec. 8, 2016, ECF 644.) Dr. Casper graduated from University College London in 2006 with a Ph.D. studying the history of medicine. (*Id.* at ¶ 3.) He has extensively studied the history of the mind and brain sciences, and published widely on the topics, including: *The*



*Neurologists: A History of a Medical Specialty in Modern Britain, c. 1789-2000, The Neurological Patient in History, and The History of the Mind and Brain Sciences: Technique, Technology, and Therapy.* Dr. Casper's written works, articles, essays and book reviews have been published in *Bulletin of the History of Medicine, Medical History, Isis, Science in Context, Science, Brain: A Journal of Neurology, British Medical Journal, Canadian Medical Association Journal, the Canadian Bulletin of the History of Medicine, and Social History of Medicine.* (*Id.* at ¶ 5; Rebuttal Decl. of Stephen T. Casper, PH.D (“Casper Rebuttal”) 4, Jan. 23, 2018.)<sup>1</sup>

Dr. Casper's expertise in the history of neurology is well-regarded internationally by historians and physicians. In the last few years alone, he has been invited to speak on the subject by the World Congress of Neurology, Manchester University, the Autonomous University of Barcelona Cornell-Weill Medical School, the Institute for the History of Medicine at Johns Hopkins University, the University of New Hampshire, and Columbia University. (Casper Rebuttal at 3.) In May 2017, Dr. Casper gave the “Neurology Grand Rounds” at Dartmouth University Medical School. (*Id.*)

In this case, Plaintiffs retained Dr. Casper to provide a historical analysis of the medical and scientific understandings of long-term complications caused by head injuries. Dr. Casper stated his objectives at the outset of his report, namely, to analyze the “developments in scientific and medical knowledge relating to (i) head trauma, concussions and subconcussive blows; (ii) treatment of head trauma and concussions; and

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<sup>1</sup> The Rebuttal Declaration of Stephen T. Casper, Ph.D. is filed contemporaneously with this Opposition.

(iii) the association between head trauma, concussions, and subconcussive blows and prolonged permanent symptoms and permanent neurological conditions.” (Casper ¶10.)

In pursuit of this objective, Dr. Casper compiled perhaps the most “comprehensive an intellectual history on the subject [of head injury research] as has ever been undertaken by any historian or clinician for the modern, post-war, and contemporary period of medicine and science.” (Casper ¶ 36.) Dr. Casper created a “primary source chronology of the history of concussion and the sequelae of concussion” that included more than 1,000 sources. (Casper ¶ 34, Ex. A.) These sources included works from medical and scientific journals, monographs, and technical report, editorials, letters to the editor, scientific and clinical reviews, and other medical and clinical literature and journalistic sources. (*Id.* at ¶ 34.) Dr. Casper furthermore, explained his method of generating historically appropriate key search terms and subject classifications, *id.* at ¶¶37-43, selecting appropriate journals, *id.* at ¶¶ 44-47, selecting relevant published primary sources, *id.* at ¶¶48-51, selecting secondary literature, *id.* at ¶¶ 54-55, and determining sources to be excluded (limited to sources published in languages other than English), *id.* at ¶¶ 56-58.

To limit bias, Dr. Casper ignored Plaintiffs’ proposed bibliography, and ultimately relied on only about half of the studies Plaintiffs highlighted. (*Id.* at ¶ 30, Ex. C.) Dr. Casper also collected the vast majority of primary sources prior to reading them, ensuring that he was blind to their content prior to reading and analyzing them in progression. (*Id.* at ¶ 35.)

After review of his collection of sources, Dr. Casper carefully and thoroughly analyzed the historical record, documenting his findings in his nearly 150 page report.

Based upon his comprehensive review, Dr. Casper concluded, among other things:

- “The historical record presents a very clear picture of the cause, effects, and resulting associations with neurological conditions of both single and repeated concussive injuries,” (*id.* ¶ 11);
- “The definition of concussion has evolved historically, but in ways that ‘naturally extend definitions’ that were first made in the nineteenth century,” (*id.* ¶ 12);
- “The historical record indicates no meaningful distinction between blows to the head suffered in one context versus another. The risk of sequelae indicated in the historical record is not dependent upon whether a blow to the head was suffered during a hockey game, football game, boxing match, car accident, physical assault, domestic battery, military exercise, combat, or any other context,” (*id.* ¶ 14);
- “The historical record of science and medicine records the association between concussive and subconcussive blows to the head and the risk of negative, long term neurological effects since the nineteenth century, and since the nineteenth century medical authorities have observed that repeated blows to the head heighten risks of those effects,” (*id.* ¶ 15);
- “The historical record indicates that head injuries in hockey have been common since the 1920s, and that hockey players receive head injuries in a variety of ways,” (*id.* ¶ 17);
- “The historical record clearly indicates from the 1920s to the present that concussed patient – athlete or not – should be allowed a significant period of recovery from such an injury,” (*id.* ¶ 18);
- “Since 1928, there has been a clear association in the historical record between repeated blows to the head in sports and pathological changes leading to long term, permanent, life-altering and sometimes degenerative personality changes, dementia, movement disorders, and disability,” (*id.* ¶ 19);
- “The historical record is clear that voices of dissent that cast doubt on the danger and risk of concussive head injuries are rare, but frequently cited. This is likely due to the careful practice of researchers seeking to present both sides of the story in their own work and having only a small sample of dissenting citations to choose

from. This would not, however, inherently lend additional credence to their findings,” (*id.* ¶ 25).

Dr. Casper’s expertise in the history of medicine and his thorough and detailed methodology contributed to his reliable conclusions, and his testimony should be deemed admissible.

## **ARGUMENT**

### **I. The Eighth Circuit Uses a Flexible *Daubert* Standard At the Class Certification Stage.**

Federal Rule of Evidence 702 allows expert opinions into evidence when “the expert’s knowledge, skill, training, experience or education will assist a trier of fact in understanding an area involving specialized subject matter.” *United States v. Johnson*, 860 F.3d 1133, 1130 (8th Cir. 2017). The “inquiry envisioned by Rule 702 is a flexible one. Its overarching subject is the scientific validity – and thus the evidentiary relevance and reliability of the principles that underlie a proposed submission.” *Adams v. Toyota MotorCorp.*, 859 F.3d 499, 511 (8th Cir. 2017) (quoting *Daubert v. Merrell Dow Pharma., Inc.*, 509 U.S. 579, 594-95 (1993)). Indeed, “cases are legion that ... call for the liberal admission of expert testimony.” *Johnson v. Mead Johnson & Co.*, 754 F.3d 557, 562 (8th Cir. 2014); *see also Daubert*, 509 U.S. 579 (noting the “liberal thrust of the Federal Rules and their general approach of relaxing the traditional barriers to opinion testimony.”). Rule 702 “clearly is one of admissibility rather than exclusion.” *Lauzon v. Senco Prods., Inc.*, 270 F.3d 681, 686 (2001).

In a *Daubert* analysis, the district court “performs a gatekeeping function with respect to scientific evidence, ensuring that evidence submitted to the jury meets Rule

702's criteria for relevance and reliability." *Bonner v. ISP Techs., Inc.*, 259 F.3d 924, 929 (8th Cir. 2001). When a *Daubert* motion is brought at the class certification stage, the court is less concerned with improper jury persuasion. See *In re Zurn Pex Plumbing Prod. Liab. Litig.*, 644 F.3d 604, 613 (8th Cir. 2011). In such cases, the Eighth Circuit implements a lighter *Daubert* analysis. See *id.* at 613 (holding a court's *Daubert* "inquiry on a motion for class certification is 'tentative,' 'preliminary,' and 'limited.'"). As the Eighth Circuit explained:

Class certification 'is inherently tentative,'.... and [a] conclusive *Daubert* inquiry cannot be reconciled with the inherently preliminary nature of pretrial evidentiary and class certification rulings.

The main purpose of *Daubert* exclusion is to protect juries from being swayed by dubious scientific testimony. That interest is not implicated at the class certification stage where the judge is the decision maker. The district court's "gatekeeping function" under *Daubert* ensures that expert evidence "submitted to the jury" is sufficiently relevant and reliable, but "[t]here is less need for the gatekeeper to keep the gate when the gatekeeper is keeping the gate only for himself." Similar reasons support less stringent application of *Daubert* in bench trials. The "usual concerns of the [*Daubert*] rule – keeping unreliable expert testimony from the jury – are not present in such a setting.

*Id.* at 613 (internal citations omitted). Following *Zurn*, courts within the Eighth Circuit generally reject attempts to exclude experts at the class certification stage. See *e.g.*, *In re Gobal Tel\*Link Corp. ICS Litig.*, No. 5:14-CV-5275, 2016 WL 6997082, at \*5 (W.D. Ark. Nov. 29, 2016) ("This Court believes that judicial economy is poorly served, and the likelihood of prejudicial error is increased, by striking or excluding expert evidence prior to making any ruling on class certification."); *In re Target Corp. Customer Data Sec. Breach Litig.*, MDL No. 14-2522, 2015 WL 5228637, at \*2 (D. Minn. Sept. 8, 2015)

(defendant's attempt to exclude expert based on an argument that it was not possible to measure a common impact from data breaches on financial institution class members rejected); *Ascaro LLC v. NL Industries, Inc.*, 106 F. Supp.3d 1015, 1022-23 (E.D. Mo. 2015) (motion to exclude contamination expert's report at class stage due to absence of sampling locations or methodology denied in view of *Zurn* standard; questions concerning factual bases and underpinnings of such a report go to the weight of the evidence); *Ebert v. General Mills, Inc.*, No. 13-CV-3341, 2015 WL 867994, at \*3-8 (D. Minn. Feb. 27, 2015) (denying defendant's motion to exclude two experts because the "application of the *Daubert* test ... is somewhat limited at the stage of class certification.")

## **II. Dr. Casper is Extensively Qualified as a Historian of Medicine.**

The NHL challenges Dr. Casper's qualifications to perform his historical review and render conclusions on the historical understanding of head trauma, concussions and subconcussive blows and their neurological effects. Def's Mem. 5-8. The NHL claims that because Dr. Casper "is not a scientist of any sort" he is not qualified to opine on historical medical sources, nor on any issue of medical ethics. Def's Mem. 7. Given that the history of medicine has existed as an established academic discipline for almost a century, it is a remarkable claim that a scientist is better positioned than an expert in the history of medicine (specializing in neurological history) to interpret the historical record. Indeed, Dr. Casper is the only expert in this litigation on any side who is qualified to render such an opinion.

Historians are often qualified as experts under Rule 702 to review historical documents, form conclusions based on those sources, and provide historical context to those sources.<sup>2</sup> See, e.g., *Waterhouse v. R.J. Reynolds Tobacco Co.*, 368 F. Supp. 2d 432, 436 (D. Md. 2005), *aff'd*, 162 F. App'x 231 (4th Cir. 2006) (relying on the testimony of a professor of history who “examined a wide array of historical scholarship and primary sources of public knowledge about the effects of tobacco use, including the *New York Times* and other national newspapers...popular magazines, government documents, manuscript collections, scholarly histories, state and federal laws regarding tobacco and cigarette smoking, curriculum guides and school text books....religious publications, polling and survey data, movies, television programs, and other forms of popular culture.”); *New York v. Shinnecock Indian Nat’n*, 523 F. Supp. 2d 185, 261-262 (E.D.N.Y. 2007) (finding a historian to be reliable where the expert “analyzed and considered the pertinent historical documents (including deeds, patents, confirmations, and other colonial era documents) in the context of the contemporary historical understandings.”). Historians, moreover, frequently form their opinions based on extensive reviews of the historical record. See *Saginaw Chippewa Indian Tribe of Michigan v. Granholm*, 690 F. Supp. 2d 622, 636 (E.D. Mich. 2010) (allowing a historian who “focused his research, writing, and teaching more broadly” to testify on native American history because of his “well reasoned and well researched report.”); *Marvel*

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<sup>2</sup> For the perspectives of historians qualified as experts, see Richard J. Evans, *History, Memory, and the Law: The Historian as an Expert Witness*, 41 *History & Theory* 326 (Oct. 2002), and David Rosner, *Trials and Tribulations: What Happens When Historians Enter the Courtroom*, 72 *L. & Contemp. Probs.* 137 (2009).

*Characters, Inc. v. Kirby*, 726 F.3d 119, 135-136 (2d Cir. 2013) (noting that a historian’s opinion may be admitted to “helpfully synthesize dense or voluminous historical texts” and “offer background knowledge or context that illuminates or places in perspective past events.”).

Dr. Casper’s impressive experience enables him to locate, collect, and review historical sources about scientific and medical knowledge related to head trauma, concussions, subconcussive blows and their neurological consequences. See Dep. of Stephen T. Casper, Ph.D. (“Casper Dep.”) 252:7-15, Feb. 22, 2017 & Mar. 22, 2017 (Ex. 1)<sup>3</sup> (“I have spent almost my entire professional career studying the history of neurology and neuroscience[.]”). Dr. Casper holds a Bachelor of Science in Neuroscience and Biochemistry and a PhD in History of Medicine. He is a tenured professor of history at Clarkson University. Casper, Ex. B, at 1; Casper Dep. 13: 3-13. He has written extensively about the history of specialization in modern medicine and the history of neurology and neuroscience. He is the author or editor of three books on those topics, one of which addresses explicitly the experiences of neurological patients in history. Casper, Ex. B, at 2-4; Casper Dep. 15: 10-14. Dr. Casper has published articles and essays about the history of medicine and the history of neurology in *Medical History*, *Social History of Medicine*, *the Canadian Bulletin of the History of Medicine*, *the Journal of the History of Medicine and Allied Sciences*, *Isis*, and many other scientific and clinical journals, including *Science*, *the British Medical Journal*, and *the Canadian Medical Association*

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<sup>3</sup> Excerpts of the deposition transcript of Stephen T. Casper are attached as Exhibit 1 to the accompanying Declaration of David M. Cialkowski.



*Journal* Casper, Ex. B. Dr. Casper has also had many high profile invitations to speak to historians and clinicians, including, for instance, the World Congress of Neurology in Santiago, Chili, Manchester University, the Autonomous University of Barcelona, Cornell-Weill Medical School, the Institute for the History of Medicine at Johns Hopkins University, and “Neurology Grand Rounds” at Dartmouth Medical College. Casper Rebuttal at 3. His resume lists over 40 presentations on the history of medicine, with over half focused on neuroscience and neurology. Casper, Ex. B, at 8-11.

Dr. Casper is also expertly positioned to understand the historical significance of the reports and the context in which those reports were created. Despite the NHL’s contentions, a “scientist” is not trained to analyze and review the historical context in which works are made, and may not understand then-used terminology and nomenclature, and the influence of developing or established practices of the time. While physicians should make a conscious effort to understand and build upon past research and knowledge in medicine to carry out present clinical and academic work, *id.* at ¶¶ 280-81, a historian is uniquely qualified to interpret the historical record. Dr. Casper has over a decade of experience in the history of neurology and can best provide context to the research spanning the nineteenth and twentieth century. Casper Dep. 252:7-15; Casper, Ex. B.

The NHL seeks to tie Dr. Casper’s fate to another expert, Dr. Castleman, whose opinion was rejected in the asbestos litigation, and who the NHL contends was “even more qualified” than Dr. Casper to perform a historical medical history review. Def’s Mem. at 7. The NHL’s comparison is entirely off point. Dr. Castleman held a PhD in

Engineering Science and was not a historian of medicine. As such, he lacked the qualifications to perform an extensive historical review. *In re Related Asbestos Cases* made that very point: “plaintiffs conceded that Mr. Castleman would be unable to describe the reaction of the medical community to the articles at the time they were first published.” 543 F. Supp. 1142, 1149 (N.D. Cal. 1982). As the NHL admits, *Krik v. Crane Co.*, 71 F. Supp. 3d 784, 788 (N.D. Ill. 2014) actually permitted Dr. Castleman to testify on the asbestos literature he reviewed for the relevant time period, but not to comment on the accuracy of the articles’ medical conclusions, precisely the type of testimony Dr. Casper provides here.<sup>4</sup> *See also Waite v. All Acquisition Corp.*, 194 F. Supp. 3d 1298 (S.D. Fla. 2016) (“a jury could not possibly examine every single letter, note, article, and publication reviewed and analyzed by Dr. Castleman . . . Certainly, research such as that presented can serve the purpose of providing context and grounding scientific information integral to the determination of this case.”)

Unlike Dr. Castleman, Dr. Casper’s extensive credentials and long experience in the history of medicine qualifies him to review historical medical sources and provide context to their creation. Maxine D. Goodman, *Slipping Through the Gate*, 60 BAYLOR L. REV. 824, 857 (2008) (an expert historian’s task is “to choose reliable sources, to read

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<sup>4</sup> Despite the NHL’s attempts to bait Dr. Casper into rendering medical-based opinions, or to assess the validity of historical studies, Dr. Casper consistently refused to testify outside his historical expertise. Casper Dep. at 28:2-3, 164:5-7, 182:15-19, 188:6-16, 190:15-191:3, 356:1-4. As such, cases upon which the NHL relies, such as *Blue Cross & Blue Shield of New Jersey, Inc. v. Philip Morris, Inc.*, No. 98-CV-3287, 2000 WL 1880283 (E.D.N.Y. Dec. 27, 2000), are inapplicable, because the experts there were called to “assist juries in understanding the validity or invalidity of scientific assertions made in various scientific studies.” *Id.* at \*2.

them reliably, and to put them together in ways that provide a narrative about the past.” (internal quotations omitted)). Dr. Casper’s historical expertise in medicine, neurology, and neuroscience positioned him to reliably create and provide a “comprehensive [intellectual history of] of medical knowledge regarding head injuries and their neurologic sequelae. Casper ¶ 36. He is more than sufficiently qualified to provide his opinion here.

### **III. Dr. Casper’s Methodology Is Reliable**

#### **A. Dr. Casper’s Methodology Is Consistent with That of An Expert in the Field.**

An expert’s methodology is reliable when it uses the “same level of intellectual rigor that characterizes the practice of an expert in the relevant field.” *Kumho Tire Co. v. Carmichael*, 526 U.S. 137, 152 (1999). Under the “liberal admissibility standards of the Federal Rules of Evidence, exclusion of expert testimony is warranted only when the district court finds serious flaws in reasoning or methodology.” *Scott v. Chipotle Mexican Grill, Inc.*, 315 F.R.D. 33, 43 (S.D.N.Y. 2016) (internal quotations omitted); *see also In re: Zimmer Nexgen Knee Implant Prods. Liab. Litig.*, No. 11-C-5468, 2015 WL 5050214, at \*6 (N.D. Ill. Aug. 25, 2015) (admitting testimony when “the methods he used were [not] so unreliable that his testimony should be kept from the jury.”); *In re Welding Fume Prods. Liab. Litig.*, 03-CV-17000, 2010 WL 7699456, at \* (N.D. Ohio, June 4, 2010) (the expert opinion must not be “so untethered from the scientific method and from reliably collected data that his opinions are inadmissible under *Daubert*.”); *Burks v. Abbott Labs*, 917 F. Supp. 2d 902, 924 (D. Minn. 2013) (“The Court does not

find that [the expert's] opinion is so fundamentally unsupported that it can offer no assistance to the jury.” (internal quotations removed)).

In his expert report, Dr. Casper details his methodology over the course of fourteen pages. *Id.* ¶¶ 29-47. He begins by explaining the purpose and objectives of his research, including the questions he was retained to examine and the timespans he would review. *Id.* at ¶ 10, 32-33. He describes his effort to create a “primary source chronology of the history of concussions” consistent with the “tradition of historiography called intellectual history.” *Id.* at ¶ 34. Dr. Casper then lists the specific means of identifying his primary sources, which included (i) identifying historically appropriate keywords and subject areas by using the *Index Medicus* and the *Surgeons General Catalogue of the United States*, (2) identifying literature in the *Index Medicus* and the *Surgeons General's Catalogue of the United States*, (3) searching database archives using historically driven keywords and subject categories, and (4) reviewing citations by historical actors to other publications. *Id.* Almost all resources were collected prior to being read to prevent bias in selecting which sources were entered into the chronology. *Id.* at ¶ 35.

Dr. Casper spends five pages exclusively detailing his method of determining appropriate keywords, search terms, and subject categories, and describing the specific journals to be included in his review and the reason for their inclusion. *Id.* at ¶¶ 37-47. When the amount of literature was too extensive to review in full, Dr. Casper prioritized “original research and reviews” and “articles with keywords in the title.” *Id.* at ¶45. As Dr. Casper admits, given the significant volume of relevant works, his collection does not include every related historical document. *Id.* at ¶ 36. This is entirely consistent with

relevant academic standards, and indeed, was not to the sole benefit of Plaintiffs, as almost half of the studies in Plaintiffs proposed bibliography were excluded. Casper ¶ 35; Casper Rebuttal at 15-22. All of the more than 1,000 sources he reviewed are all listed in the bibliography. *Id.* at ¶ 37.

Dr. Casper's rigorous methodology is consistent with "the practice of an expert in the relevant field." *See Kumho*, 526 U.S. at 152. He conformed his historical review to the standards of intellectual history, which involves "reviewing a broad collection of representative sources that speak to each other across a whole period and that provide a clear explanatory view of the ways that medical and scientific knowledge has evolved, accumulated, and why." Casper ¶ 66. All historians must "leav[e] a clear trail for subsequent historians to follow" by providing "bibliographies and annotations (and associated institutional repositories like libraries, archives, and museums) [which] enables other historians to retrace the steps in an argument to make sure those steps are justified." *See Statement on Standards of Professional Conduct*, American Historical Association, at 2 (last visited, Jan. 16, 2017)(hereinafter, *Statement of Standards*).<sup>5</sup>

Historians also emphasize context in the interpretation of the historical record. *Id.* ("We honor the historical record, but understand that its interpretation constantly evolves as historians analyze primary documents in light of the ever-expanding body of secondary literature that places those documents in a larger context."); Casper ¶ 66 ("the social, cultural, economic, policy, and legal contexts . . . might well explain different

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<sup>5</sup> Available at <https://www.historians.org/jobs-and-professional-development/statements-standards-and-guidelines-of-the-discipline/statement-on-standards-of-professional-conduct>

anxieties and pressures with which scientists and healthcare professionals in the past (and likely in the present) contended.”). Dr. Casper repeatedly emphasizes his objective is to understand the medical history of head injury research in the context in which it was created. Casper Dep. 35:3-8 (“Historians would engage methodologically in improper behavior to define a term. What we try to do is . . . to use the term in the sense that the people we are studying used it.”); *id.* at 86:11-17 (“[S]tandards in the present day may not conform to standards in the past. And as a historian, I don’t engage in anachronism and hold people accountable to standards that they didn’t know had been invented.”); *id.* at 100:13-22-101:1-2 (“[H]istorians read the entire source. And they think about how the source can be placed into the context of other primary sources. If we are going to talk about a single line or a single sentence, the problem that I’m going to get into here is that I need to represent those sentences within the context . . . and meaning of the sources as I can understand them as a historian; and th[en] I need to try to reflect on where it is situated in the historical record.”).

Dr. Casper’s review is also completely reproducible – the NHL has Dr. Casper’s entire bibliography and can review each source to form its own conclusions. If it so wishes, it can also retrace Dr. Casper’s creation of relevant key terms and search words and perform the same database searches. *See In re Whirlpool Corp. Front-Loading Washer Prods. Liab. Litig.*, 45 F. Supp. 3d 724, 765 (N.D. Ohio 2014) (noting the plaintiff’s expert “documents and explains each step of his work, thereby laying a proper foundation for his analysis . . . [and] so thoroughly explained his methodology that [defendant’s] expert . . . reproduced [plaintiff’s expert’s] searches and obtained virtually

identical results.”); *In re Zimmer*, 2015 WL 5050214, at \*8 (“If Plaintiffs wish to challenge the validity of the reported search results or the choices to eliminate articles, they are free to repeat the searches on the databases.” (internal quotations omitted)).

The cases the NHL cites demonstrate Dr. Casper’s vastly superior methodology to those deemed unreliable and inadmissible. For example, in *Perez v. State Farm Mut. Auto Ins. Co.*, the court excluded expert testimony based on a literature review because the expert “testified that he relied largely on documents which he either had on hand or that were sent to him by plaintiffs’ counsel.” No. C 6-019362, 2012 WL 3116355, at \* (N.D. Cal. July 31, 2012). Here, Dr. Casper ignored Plaintiffs’ provided bibliography, and indeed, did not rely on almost half of the studies Plaintiffs’ suggested. Casper ¶ 35. Likewise, *In re Lipitor (Atorvastatin Calcium) Marketing, Sales Practices and Prods. Liabl. Litig.*, the proposed expert performed *no* independent review of the literature: “Plaintiffs have made no showing whatsoever that [the expert] performed any search to obtain relevant literature.” 174 F. Supp. 3d 911, 930 (D.S.C. 2016). Again, in this case, Dr. Casper created and analyzed one of, perhaps even the most, comprehensive archive of historical sources on head injury ever produced. Casper ¶ 36.

*Doe v. Ortho-Clinical Diagnostics, Inc.*, 440 F. Supp. 2d 465 (M.D.N.C. 2006), is even less relevant. There, the expert made conclusions based on studies completely unrelated to the causation question at issue and every epidemiological study available at the time contradicted his opinion. *See Id.* at 474 (“Dr. Grier’s conclusion that the peer-reviewed literature he has relied upon supports his theory that autism is caused by thimerosal is flatly contradicted by *all of the* epidemiological studies available at this time.”

(emphasis added)). By contrast, Dr. Casper's methodology produced over 1,000 relevant studies that inform and support his conclusions.

Finally, the NHL argues that Dr. Casper placed "outsized emphasis" on older articles, while not "calibrating" his research to account for the greater number of post-2000 articles related to the effects of repeated head trauma. Def's Mem. 11. This argument is grossly misplaced. Dr. Casper's analysis was historical in nature, and addresses how past medical professionals and scientists understood head trauma and their long-term effects. Casper ¶ 10 ("I was retained by the plaintiffs in this litigation to undertake a historical analysis."). It makes no sense to "calibrate" his research or to limit his emphasis on past articles because his entire analysis revolved around reviewing historical understandings of those time periods. Although the many post-2000 articles may impact the ultimate determination of causation in this case, Dr. Casper is not a causation expert. He was asked to review the historical record, and as such, his emphasis on historical documents does not render his opinion unreliable.

**B. Dr. Casper Was Not Required To Follow the Epidemiological Method.**

The NHL next asserts Dr. Casper's methodology was improper because it did not "abide by" the epidemiological method and included case reports. Def's Mem. 12-17. The NHL's characterization of the epidemiological hierarchy as a mandatory standard by which medical sources must be judged is entirely incorrect. First, the epidemiological method is a one of scientific analysis, not historical inquiry. Every case cited by the NHL in this regard involves an assessment of a *causation* expert. Dr. Casper is not a causation expert, and is not making scientific conclusions about concussions (although he does



explain how past clinicians and scientists associated head trauma and degenerative disease throughout the entirety of his declaration).

Instead, Dr. Casper's conclusions are historical in nature, reflecting the developing views of medical professionals about concussions over the twentieth century. Dr. Casper's methodology fits squarely within that assessment. *See Saginaw Chippewa Indian Tribe*, 690 F. Supp. 2d at 635-36 (accepting a historian's report based on "extensive primary source research conducted specifically in preparation for this case."); *Langbord v. United States Dept. of Treasury*, No. 6-CV -05315, 2009 WL 1312576, at \*7 (E.D. Pa. May 7, 2009) (finding expert's methodology reliable where it "consisted of reviewing thousands of historical documents, books, and articles related to the history" at issue). A historical analysis of the knowledge of medical research is entirely distinct from a causation expert who is specifically asked to opine on whether scientific evidence supports a causal link between an injury and effect.

Second, the NHL is trying to impose its own view as to the "best" method of reviewing medical literature upon an actual expert who knows better. Moreover, the NHL's generic reference to the "epidemiological method" minimizes the numerous differing views on the correct hierarchy of evidence. *See* Ross E.G. Upshur, *Are All Evidence-Based Practices Alike? Problems in Ranking Evidence*, 30 CMAJ 672, 672 ("The existence of multiple classifications for evaluating and structuring evidence and the differing interpretations of grades of recommendations on the basis of this evidence pose potential problems."). One researcher found over 80 distinct hierarchies of evidence. Christopher J. Blunt, *Hierarchies of Evidence in Evidence-Based Medicine* (Sept. 2015)

(unpublished Ph.D. thesis, London School of Economics and Political Science).<sup>6</sup> The sheer number of “best” evidentiary hierarchies allows evidentiary analyses to be “misappropriated and distorted by vested interest”.<sup>7</sup> Trisha Greenhalgh, *Evidence Based Medicine: A Movement in Crisis*, 348 *BMJ* 3725 (2014); Ross E.G. Upshur, *Legitimacy, Authority, and Hierarchy: Critical Challenges for Evidence-Based Medicine*, 4 *Brief Treatment and Crisis Intervention* 197, 200 (2004) (“It is now clear that what constitutes best evidence varies according to the hierarchy, and the hierarchies are not commensurable.”) The NHL may believe an epidemiological hierarchy is the “best” method, but what type of hierarchy is “best” is unclear. At any rate, it is not incumbent on Dr. Casper to use only the NHL’s purported “best” methodology; he need only use a reliable method. *Lentz v. Mason*, 32 F. Supp. 2d 733, 746 (D.N.J. 1999).

Finally, applying the epidemiological hierarchy here makes little sense. The epidemiological method was not pioneered until the 1990s, over a century before Dr. Casper’s historical review begins. The NHL demands Dr. Casper transpose modern and contested evidentiary principles on past research – a demand that would significantly damage and dishonor the integrity of the historical record. Casper Dep. 86:11-17

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<sup>6</sup> Available at [http://etheses.lse.ac.uk/3284/1/Blunt\\_heirachies\\_of\\_evidence.pdf](http://etheses.lse.ac.uk/3284/1/Blunt_heirachies_of_evidence.pdf)

<sup>7</sup> The NHL demands randomized, double-blind trials, which it claims is the top of the evidentiary hierarchy, but it is not always true that such studies led to more valid and acceptable results than other study designs like observational studies. See Gordon C.S. Smith & Jill P. Pell, *Parachute use to prevent death and major trauma related to gravitation challenge: systematic review of randomized controlled trials*, 327 *BMJ* 1459, 1459-60 (2003) (pointing out that randomized controlled trials for the benefits of parachute use have not been performed, and suggesting that “[i]ndividuals who insist that all interventions need to be validated by a randomized controlled trial need to come down to earth.”), available at <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC300808/pdf/32701459.pdf>.

("[S]tandards in the present day may not conform to standards in the past. And as a historian, I don't engage in anachronism and hold people accountable to standards that they didn't know had been invented."); *see also Statement of Standards* at 2 ("All historians believe in honoring the integrity of the historical record.") Clinicians in the past did not analyze their work according to the epidemiological hierarchy, and applying that hierarchy *ex post facto* only distorts the views and understandings of medical professionals at the time they were expressed. Accepting studies based purely on its rank in an epidemiological hierarchy would almost certainly require excluding important clinicians like Alois Alzheimer and James Parkinson from the history of medicine, because they published their work as a single or small series of case histories. Casper ¶ 147. Nonetheless, it appears to be the express goal of the NHL to eliminate from consideration unfavorable historical contributions to concussion-based research by demanding untenably strict scientific scrutiny. If the NHL truly believes the historical opinions and views of past medical researchers deserve less weight because they are based upon supposedly inferior study methodology, then the NHL is free to raise those issues before a jury. *See Waite*, 194 F. Supp. 3d at 1308 ("[E]vidence of limitations to the studies presented does not render the studies unreliable." (quoting Fed. Jur. Ctr., Reference Manual on Scientific Evidence 553 (3d ed. 2011))). However, it is not appropriate to demand the Court ignore the historical record because it supposedly does not conform with what the NHL considers to be the "best" modern evidentiary principles, an assertion that remains hotly contested.

**C. Dr. Casper's Conclusions Are Supported by the Historical Record.**

The NHL claims Dr. Casper's conclusions are "speculative" because he supposedly did not consider the express limitations of the studies he cites. However, the fact some evidence is contrary to Dr. Casper's conclusions does not render his methods or opinions unreliable. *Linde v. Arab Bank, PLC*, 922 F. Supp. 2d 316, 321 (E.D.N.Y. 2013) ("Rule 702 does not require that published studies or similar authority unequivocally support the expert's conclusions."); *See In re Zimmer*, 2015 WL 5050214, at \*8 ("Systematic literature reviews, by design, have some limitations, as [do] all research methodologies." (internal quotations omitted)); *Arnold v. Cargill, Inc.*, No. 01-2086 (DFW/AJB), 2006 WL 1716221, at \*7 (D. Minn. June 20, 2006) ("The court also agrees with Plaintiffs that the fact that some social-science research is inconsistent with [the expert's] testimony goes to the weight, not the admissibility."); *Smith v. BMW No. Am., Inc.*, 398 F.d 913, 919-20 (8th Cir. 2002) ("the fact that experts in other fields might also be able to form opinions . . . and would base those opinions on factors other than those used by Dr. Erickson does not disqualify Dr. Erickson from offering testimony that would be helpful to the jury.").

Despite the NHL's position, Dr. Casper consciously sought to address competing viewpoints in the literature he reviewed:

- "I also looked at the issue of how evolving knowledge, including evolving nomenclature, was utilized by the medical and scientific community, as well as the extent and nature of any dissent in the literature." Casper ¶ 10;
- "This report provides an evidence-based account of these changes over the last 145 years. It covers . . . the nature of consensus and dissent about the findings of various time periods." *Id.* at ¶ 62;

- “One guiding premise for this study is that it is the nature of science to be a provisional way of knowing . . . For this reason, it would be expected to find scientific scholarship calling attention to alternative hypotheses, hypotheses that provided wrong, contradictory data, failed predictions, or other facts that call into question the science . . . Scientific progress often reflects back and forth exchanges.” *Id.* at ¶ 63;
- “[T]here has [not] been a complete absence of competing theories, voices of dissent, or challenges to the prevailing medical consensus that had been established over decades of medical and scientific work. As reflected upon at the outset of this report – that is normal science.” *Id.* at ¶ 273;
- “From a historical view, scientific and medical work as an accumulative enterprise is only as good as the trust that can exist in its experts’ reports and foundational research. This is not to say that such records should be excluded from historical study – indeed they should be included precisely because they are a part of what was published.” *Id.* at ¶ 70.

Dr. Casper’s attempt to consider all sides of the historical conversation on head injuries is fulfilled in his report. Nevertheless, the NHL accuses Dr. Casper of improperly excluding consideration of some researchers’ opinion that “universal agreement is apparently lacking as to the definition of concussion,” even though Dr. Casper devotes significant consideration to that very statement. Casper ¶¶ 100-101 (considering the accuracy of the statement that there was “no universal agreement on the standard definition or nature of concussion.”); Def’s Mem. at 19.

The NHL also asserts Dr. Casper should have considered a 1976 *Lancet* editorial, which posits that boxing may be the only sport involving “repeated blows to the head which are intense enough to produce . . . irreversible ‘traumatic encephalopathy.’” Def’s Mem. at 19. Dr. Casper not only considered this article, he explicitly drew the NHL’s attention to it. Casper Rebuttal at 16. Again, Dr. Casper refers in his report to the exact

language the NHL quotes from the 1976 editorial. Casper ¶ 263 (noting “an editorial response . . . observed that at the same time there was no clear evidence that sports other than boxing caused irreversible ‘traumatic encephalopathy.’”) Unlike the NHL, Dr. Casper considered the editorial in its entirety and placed it in historical context, noting both the circumstances that generated its appearance in the first place, as well as the author’s observation that punch-drunk conditions have been described in soccer players, amateur rugby players, a parachute jumper, and horse jockeys. *Id.* Dr. Casper discusses competing views in the historical record at length, and the NHL’s cherry-picked phrases do not undermine his thorough examination.

**D. Dr. Casper Properly Examined the Full Spectrum of Head Injuries.**

The NHL claims Dr. Casper’s report is unreliable because it supposedly “conflates” different injuries and diseases. Specifically, the NHL takes issue with the fact Dr. Casper did not distinguish studies based on the severity of the head trauma (subconcussive versus concussive, and mild traumatic brain injury (“mTBI”) versus traumatic brain injury (“TBI”)). Def’s Mem. at 19-23. In reality, it was entirely appropriate for Dr. Casper to consider the broad spectrum of head-related injuries.

First, NHL players experience a wide variety of head-related injuries, and for Dr. Casper to review the historical understandings of the long-term complications caused by head injuries during NHL gameplay, he was likewise required to review the full spectrum of head-related injuries. The NHL points to three studies – out of the more than 1,000 sources Dr. Casper reviewed – that it believes were improperly considered. Def’s Mem. at 20-21. These three studies include subjects with severe head trauma caused by a blow

in a boxing match, a train passenger hit by a pole, and a rod that pierced the subject's brain. Notably, *none* of the subjects' head-injuries were fatal. By contrast, Bill Masterton, a former NHL player died from a terrible head injury sustained during a game in 1968. NHL players also experience non-lethal but severe head injuries through knockouts caused by checks, punches, hockey pucks and other means. Knockouts are so innumerable through professional hockey's existence that the internet is filled with "top knockout" videos.<sup>8</sup> The NHL's attempts to minimize the degree of significant head injuries in hockey cannot be taken seriously in light of the many players forced to retire due to either single, or repeated, concussions. *See NHL Careers Ended By Concussions*, Sports Illustrated (Apr. 17, 2013);<sup>9</sup> *see also* Casper n.37, n.38.

Apart from significant head trauma, NHL players regularly experience subconcussive blows. Concussive and subconcussive blows in hockey are so frequent that researchers describe hockey, as they have for contact sports generally, as a "laboratory" for research on the spectrum of head injury, from subconcussive blows to far worse. Casper ¶ 128 (quoting J.P. Kelly, *Preface*, 13 *J. Head Injury Rehabilitation* 2 (1998), which stated "[t]he sports arena serves as a laboratory setting for the advance of

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<sup>8</sup> Simply searching "NHL Knockouts" on Youtube.com revealed the following, and many others: CanucksFan27, *NHL: Knockouts*, Youtube.com (Aug. 3, 2016), [https://www.youtube.com/watch?v=NsswAP2\\_HZA](https://www.youtube.com/watch?v=NsswAP2_HZA); GHvidPro, *7 Greatest NHL Hockey Knockouts*, Youtube.com (Feb. 15, 2016), <https://www.youtube.com/watch?v=wH1CrJMvqsk&t=44s>; Sports Zone, *10 Most Shocking NHL Hockey Fights - NHL Knockout Compilation*, Youtube.com (Feb. 4, 2017), <https://www.youtube.com/watch?v=B35IMN9cWxk>; Sports Dunker, *NHL Knockouts*, Youtube.com (Oct. 6, 2017), <https://www.youtube.com/watch?v=7ZL7a0lOIBA>; Kent Murtaugh, *Top 10 Hockey Knockouts \*BEST\**, Youtube.com (Feb. 26, 2013), [https://www.youtube.com/watch?v=lyzsm0aw\\_Jk](https://www.youtube.com/watch?v=lyzsm0aw_Jk).

<sup>9</sup> Available at <https://www.si.com/nhl/photos/2013/04/17nhl-careers-ended-by-concussions#4>

athletic injury. The opportunity to learn about traumatic brain injury in this way has not been fully explored.”). The wide variety of head trauma experienced by NHL players renders it not only reasonable but necessary to examine medical professionals’ understandings of the full spectrum of head injuries.

Second, even if, the injuries in the case studies cited by the NHL were not representative of the injuries experienced in hockey, that fact would not undermine Dr. Casper’s conclusions. Dr. Casper sought to understand the historical knowledge of head injuries and their neurologic sequelae. Casper ¶ 10. These studies provided important insight for researchers about the permanent consequences of a single and repeated head injuries, which ultimately informed – and was often directly cited by – later medical professionals. The same is true for studies of punch-drunkenness in boxers. Despite the NHL’s claim that “there is no basis . . . for suggesting that clinicians working with non-boxer athletes should have extrapolated literature on boxers to the treatment of non-boxers,” Dr. Casper’s report shows clinicians did just that. Def’s Mem. at 24; Casper ¶ 230-231 (after discussing punch-drunkenness in boxers and football players, one researcher states “[i]t is probable that no head blow is taken with impunity, and that each knock-out causes definite and irreparable damage.”). And, as researchers at Boston University have recently and unsurprisingly shown, the severe consequences of head injuries exist regardless of their severity or whether they rise to the level of an actual concussion, sub-concussive blow, or something else. Casper Rebuttal n.15; *see also* Tagge, C.A., *et al.*, *Concussion, microvascular injury, and early tauopathy in young athletes after head injury and an impact concussion mouse model*, *Brain* 2, 31 (Jan. 18, 2018) (“closed-head



impact injury, independent of concussion, represents a potent insult with potential to induce enduring neurophysiological dysfunction and persistent (and possibly progressive) sequelae.”)

Finally, the NHL’s demand that Dr. Casper retroactively categorize historical head injuries reviewed by researchers would be entirely inappropriate. To start, Dr. Casper is not a medical professional, and does not have the qualifications to perform such a *post hoc* categorization. Moreover, importantly, Dr. Casper set out to establish how definitions changed overtime. The NHL’s own experts admit, for example, that the comparatively recent distinction between TBI and mTBI is “vaguely defined,” and that the definition of subconcussive impacts is “still in its infancy and evolving.” Def’s Mem. at 22-23. If current experts in the field differ as to the distinctions between these types of hits now, then demanding Dr. Casper apply them to an era where these terms did not exist is not only nonsensical, it would require an ahistorical approach to a historical record that reflected an evolution of categories and definitions across more than a century of time. Casper Dep. 47:1-5 (“[T]he language of MTBI and TBI showed up relatively late in the historical record, and . . . those definitions reflected the cumulative transformation of the definition overtime.”) Dr. Casper establishes that past clinicians and scientists, while admitting that the nomenclature was imperfect, also confidently used it in their own writing and research, and routinely cited the work of others without concern that they might be describing different things, suggesting the existence of a robust understanding of the nature of these injuries. Casper ¶ 94 (“After the mid-twentieth century, major medical journals and bodies have provided consensus definitions of closed head injuries

that clearly reflect strong family resemblances but were updated to reflect new information and sometimes new nomenclature preferences.”); *see also id.* at ¶¶ 132-134, n.102.

The better approach is to understand historical sources within the context in which they were created, and the historical consensus is that repeated head trauma, whether concussive or subconcussive, leads to lasting neurological complications. Casper ¶ 163 (quoting a 1901 report stating “[c]oncussion of the brain may be followed by all sorts of lasting disturbances, by changes in temper and disposition, by impairment in mental power and physical endurance.”), ¶ 181 (citing one study that found “178 patients with cerebral concussion, [with] several . . . still showing either minor symptoms, some disability, or complete disability one year after receiving the injury), ¶ 183 (“some patients with seemingly insignificant periods of unconsciousness or posttraumatic amnesia may evidence considerable postconcussive impairment.”), ¶ 186 (finding that “a single mild head injury in college football caused noteworthy psychological symptoms which tended towards recovery, albeit perhaps incomplete recovery.”), ¶ 203 (noting that in “1927 two neurologists hypothesize that what they call postconcussion neuroses are symptomatic evidence of the structural pathological changes.”, ¶ 203 (describing neurologists in 1957 who “understood . . . a form of chronic traumatic encephalopathy, hypothesized to have resulted from multiple minor cerebral contusions.”); *see also* Casper ¶¶ 244, 217, 219, 230-31, 166-67.

**E. Dr. Casper's Conclusions Were Formed Based on His Thorough Review of the Thousands of Sources He Collected Related To Head Hits and Their Long-Term Effects.**

The NHL makes the baseless claim that Dr. Casper reasoned backward from a pre-determined conclusion. To support its assertion, the NHL cites its own factual disagreements as to Dr. Casper's conclusions, and argues that Dr. Casper should have accorded more weight to certain studies. "As a general rule, the factual basis of an expert opinion goes to the credibility, not the admissibility, and it is up to the opposing party to examine the factual basis for the opinion in cross examination." *Rockwood Retaining Walls, Inc. v. Patterson, Thuente, Skaar & Christensen, P.A.*, No. Civ. 09-2493, 2011 WL 2845529, at \*3 (D. Minn. July 18, 2011). Rule 702 "does not require that published studies or similar authority unequivocally support the expert's conclusions." *Linde*, 922 F. Supp. 2d at 321. Despite the NHL's disagreement as to Dr. Casper's conclusions, each are supported by the historical record, to which Dr. Casper extensively cites.

The NHL believes Dr. Casper's use of the word 'dissent' proves he reasoned backward from a desired conclusion. It is hard to imagine after reviewing over one-thousand sources that Dr. Casper could not reasonably conclude which views were "prevailing" and which were "dissenting." However, in total, Dr. Casper only uses the word "dissent" in four paragraphs, hardly indicative of a predetermined position. Moreover, Dr Casper shows that the nature of dissent changed substantially across the twentieth century. Freudians, for example, routinely argued that the symptoms of head trauma were caused by unconscious drives and motives. *See Casper* at ¶¶ 132, 134, 143, 198, 227. Dr. Casper notes that several authorities in the 1930s pushed back against

those claims on the grounds that brain lesions could also produce such symptoms. *Id.* at 227. More generally, based on his review, Dr. Casper concluded that the overwhelming weight of authority showed a clear clinical understanding and concern that there was a connection between hits to the head and the development of long term neurological consequences, even as quite unremarkably there were a few who dissented for a variety of reasons from that observation. *Id.* at ¶¶ 15-16, 25-26.

The NHL also argues that debates in the early 2000s about the specific issue of a causal link between CTE and football undermine Dr. Casper's more general conclusion that the historical record has reflected for decades the medical knowledge that head trauma causes long-term neurological complications. Whether very recent CTE-specific studies bear on Dr. Casper's more general conclusions is a factual question for the jury. At any rate, Dr. Casper's failure to cite to certain of those studies does not render his methodology unreliable. Dr. Casper's report entails both the prevailing and contrasting views of medical professionals, both of which Dr. Casper took into consideration when forming his opinions.

The NHL next argues that Dr. Casper's opinion was predetermined because he supposedly dismisses the effect of genetics on neurological complications. Here, the NHL misrepresents Dr. Casper's testimony, stating he describes inquiries into the genetic causes of neurocognitive illnesses as "dehumanizing," when Dr. Casper clearly used those terms to describe a 1941 article asserting boxers who develop punch drunkenness "are defective[] to begin with." Casper ¶ 35. Dr. Casper never suggested the illegitimacy of genetic effects on neurocognitive issues but he expressed concern that they were

being overdetermined for rhetorical distraction. Dr. Casper acknowledge that in “the 1980s, the influence of genetics led to studies of the association of genetic markers with long-term neurological consequences.” *Id.* at ¶ 199.

Likewise, the NHL casts Dr. Casper’s discussion of the specialization of sports medicine entirely out of context. Def’s Mem.at 28. In fact, Dr. Casper explains that only a small cohort of sports medicine researchers “claim[ed] the difference between sport concussion and brain concussion as great enough to make longstanding and ongoing findings in concussion research elsewhere in medicine potentially distinguishable to sport concussion injuries.” Casper ¶ 126. Dr. Casper notes the majority of researchers believed longstanding concussion research should inform sport-related concussion research. Even so, he emphasizes that “*in no way* does this report suggest that any authors . . . were engaged in any kind of . . . deception” and “there appears to have been no obvious intention to mislead behind the emergence and growth in popularity of the notion of distinct ‘sports concussion.’” *Id.* at 130 (emphasis in original).

#### **IV. Dr. Casper’s Conclusions are Supported By the Historical Record**

The NHL argues Dr. Casper offers personal subjective opinions in his testimony. This claim is baseless, and the supposed examples the NHL provides demonstrate that each of Dr. Casper’s conclusions are well-supported by the historical record. Under Rule 702’s liberal admissibility standards, expert testimony is permitted when “supported by data, methodology or studies,” unless “there is simply too great an analytical gap between the data and the opinion proffered.” *Linde v. Arab Bank, PLC*, 922 F. Supp. 2d 316, 321 (E.D.N.Y. 2013).

The NHL claims Dr. Casper subjectively concluded medical doctors are ethically bound to “apprise themselves of modern medical standards.” Def’s Mem. at 30. Dr. Casper’s statement is not “subjective” at all, as he cites for support both the American Medical Association’s (“AMA”) guidelines and the Hippocratic Oath. Casper ¶ 280. The AMA’s guidelines stated as far back as 1957 that “[p]hysicians should strive continually to improve medical knowledge,” and later iterations emphasized “physician[s] shall continue to study, apply, and advance scientific knowledge.” *Id.*

Dr. Casper states NHL clinicians were obligated to study and know developments in medicine and scientific literature, and that literature supported the conclusion that “concussions and repeated concussions are dangerous.” *Id.* at 280-282. Dr. Casper is not required to blind himself to the many instances where NHL players “return[ed] to the same game after a loss of consciousness, and to play in games while still symptomatic from earlier concussions.” Casper ¶ 84-86. That type of treatment would not occur outside of a sporting arena, and Dr. Casper’s position that it demonstrated a “discrepancy” with the normal treatment of concussion is supported, a fact sometimes testified to by doctors themselves in newspaper reports. *Id.* at ¶¶ 77, 75, 86, n.40

Finally, the NHL asserts Dr. Casper suggests NHL fans are “ethically bankrupt,” a meritless and false accusation. *See* Casper ¶ 277 (noting “it is probably . . . true that especially in the context of sports, audiences engage in a suspension of disbelief because of the incredible prowess of talent of the athletes.”) That fans probably do not appreciate the harm caused to athletes by head injuries does not imply fans are ethically bankrupt.

The NHL's distortions of Dr. Casper's testimony are no basis for undermining his reliable conclusions and methodology.

**V. Dr. Casper's Testimony Fits Rule 702 and Does Not Usurp the Role of the Jury.**

Finally, the NHL claims Dr. Casper's testimony usurps the role of the jury because he summarizes the contents of literature of documents that jurors can evaluate for themselves. Def's Mem at 31. Putting aside whether a jury could possibly review over 1,000 sources during trial, experts frequently "synthesize and integrate the available relevant literature within a field to answer some clinical question posed at the outset." *In re Zimmer*, 2015 WL 5050214, at \*3; *see also Marvel*, 726 F.3d at 135 (noting historians may be permitted to "helpfully synthesize dense or voluminous historical texts" or "offer background knowledge or context that illuminates or places in perspective past events."); *Waite*, 194 F. Supp. 3d at 1311 ("A jury could not possibly examine every single letter, note, article, and publication reviewed and analyzed by" the expert."). At any rate, jurors do not share Dr. Casper's extensive experience as a historian of medicine, and would not understand the context in which these studies were made or how they relate to each other across time. Dr. Casper's expertise as a historian of medicine specializing in the history of neurology positions him to best analyze and understand the historical record, and to convey that information to the jury.

**CONCLUSION**

For the foregoing reasons, the Court should deny the NHL's motion to exclude the expert opinions of Dr. Stephen Casper.

DATED: February 9, 2018

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**UNITED STATES DISTRICT COURT  
DISTRICT OF MINNESOTA**

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IN RE: NATIONAL HOCKEY LEAGUE  
PLAYERS' CONCUSSION INJURY  
LITIGATION

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This Document Relates To:  
ALL ACTIONS

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)  
) MDL No. 14-2551 (SRN/JSM)  
)  
) **LOCAL RULE 7.1(f) WORD**  
) **COUNT COMPLIANCE**  
) **CERTIFICATE REGARDING**  
) **PLAINTIFFS' MEMORANDUM**  
) **OF LAW IN OPPOSITION TO**  
) **DEFENDANT NATIONAL**  
) **HOCKEY LEAGUE'S MOTION**  
) **TO EXCLUDE THE TESTIMONY**  
) **OF STEPHEN T. CASPER PH.D.**  
)

I, Charles S. Zimmerman, certify that Plaintiffs' Plaintiffs' Memorandum of Law in Opposition to Defendant National Hockey League's Motion to Exclude Stephen T. Casper, Ph.D. complies with Local Rule 7.1(f).

I further certify that, in preparation of this memorandum, I used Microsoft Office Word 2010, and that this word processing program has been applied specifically to include all text, including headings, footnotes, and quotations in the following word count.

I further certify that the above referenced memorandum contains 9,327 words in 13-point Times New Roman font.

Dated: February 9, 2018

*s/ Charles S. Zimmerman*

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