

IN THE SUPERIOR COURT OF THE STATE OF DELAWARE

IN AND FOR NEW CASTLE COUNTY

CORRINE A. LONG, individually and as)
Administratrix of the Estate of JOSEPH F.)
LONG, Deceased, and as Next Friend and)
Guardian Ad Litem to JOSEPH F. LONG,)
JR., a minor,)

Plaintiffs,)

v.)

C.A. No. 00C-12-249 MMJ

WEIDER NUTRITION GROUP, INC., a)
Utah corporation, SPORTS)
SUPPLEMENTS SOUTH, INC., a)
Virginia corporation, GNC)
FRANCHISING, INC., a Pennsylvania)
corporation, B. TETI CORPORATION)
and TECCA CORPORATION,)

Defendants.)

Submitted: June 21, 2004

Decided: June 25, 2004

*Defendants' Joint Motion to Exclude Opinions of Plaintiffs'
Experts on Causation Issues*

DENIED

MEMORANDUM OPINION

Bartholomew J. Dalton, Esquire, Laura J. Simon, Esquire, Dalton & Associates, P.A.,
Wilmington, Delaware; Patrick A. Malone, Esquire, Stein, Mitchell & Mezines
(argued), Attorney for Plaintiffs

Neal C. Glenn, Esquire, Kelly Jasons McGuire & Spinelli LLP, Wilmington,
Delaware, Attorney for Defendants

JOHNSTON, Judge

Defendants filed a Joint Motion for Order Excluding the Opinions of Plaintiffs' Experts on Causation Issues. Defendants contend that Plaintiffs' experts have issued opinions on general and specific causation that are based upon methodologies that are unreliable, unscientific, and not generally accepted. Therefore, Defendants argue that the opinions are inadmissible under the standards set forth in *Daubert v. Merrell Dow Pharmaceuticals, Inc.*,¹ and Delaware case law adopting the *Daubert* standard.

FACTUAL SUMMARY

For purposes of determining Defendants' motion, the following facts are undisputed. Joseph F. Long suffered sudden cardiac death ("SCD") on November 4, 1999. The report of Adrienne Sekula-Perelman, M.D., Deputy Chief Medical Examiner, listed the cause of death as "CARDIAC HYPERTROPHY COMPLICATED BY ADVERSE REACTION TO EPHEDRINE."

Long was diagnosed in 1981 with congenital aortic stenosis, which is a narrowing of the valve through which blood flows from the heart's left ventricle into the aorta, the major artery that delivers blood to the rest of the body. At the age of 14, Long had a surgical procedure called a valvulotomy. Although Long

¹509 U.S. 579 (1993).

was essentially symptom-free, Long was advised to avoid strenuous and competitive activities.

In April 1983, an echocardiogram demonstrated that Long had concentric hypertrophy (enlargement of the heart muscle) with wall thickness of approximately 1.1 centimeters, and a bicuspid valve (two leaflets instead of the usual three), which appeared to open well. Long's aortic stenosis was stable and under control for 13 years. In 1992, Long's left ventricular wall thickness was measured at 1.22 centimeters, consistent with moderate stenosis. In 1997, Long was evaluated by Dr. Judith Rippert, a cardiologist. The cardiogram at that time showed moderate aortic stenosis and the left ventricular wall thickness was 1.2 centimeters, which is within the upper range of normal.

On June 17, 1998, Long was involved in a one-car accident where he had either fallen asleep or passed out at the wheel of his car. The parties dispute whether this incident was an episode of syncope (fainting due to insufficient blood supply to the brain), a symptom of aortic stenosis.

Long also was treated beginning in 1992 for anxiety and was taking prescription Effexor at the time of his death. The morning he died, Long smoked marijuana. The parties have acknowledged a dispute concerning Long's past use of amphetamines and cocaine.

Long worked as a pipe fitter. Long's wife customarily packed his lunch and included a bottle of "Ripped Force," a dietary supplement containing ephedrine and caffeine. Ripped Force was manufactured or distributed or sold by Defendants. Long's practice was to drink a bottle of Ripped Force during his morning work break and a second bottle after work before he exercised at the gym. Plaintiffs will present testimony that Long consumed two bottles of Ripped Force four to six times a week for a period of approximately six months. The toxicology report in Long's autopsy states that at the time of death, Long had approximately 490 ng/ml of ephedrine in his blood. The drug screen was positive for cannabinoids.

PLAINTIFFS' EXPERT OPINIONS

Christine A. Haller, M.D.

Dr. Christine A. Haller is presented by Plaintiffs as an expert in pathology and toxicology. Dr. Haller's expertise in these fields generally is not disputed. Dr. Haller's expert opinion is regarding the association between the use of an ephedrine-alkaloid product (Ripped Force) and Long's death. Dr. Haller conducted National Institute of Health-funded research on dietary supplements containing ephedra. In 2000, she published in the New England Journal of Medicine the first large case series of adverse cardiovascular events associated

with supplements containing ephedra. Dr. Haller subsequently conducted three human clinical studies in healthy human volunteers on the pharmacology of ephedra and ephedrine, including two randomized, double-blinded placebo-controlled studies. This research has been subject to peer review on several occasions. On the issue of general causation, Dr. Haller concluded:

Our studies have shown that moderate doses of ephedra and caffeine produce significant increases in heart rate and systolic blood pressure in healthy people without underlying risk factors or obesity. These studies further confirm ephedra's potential to cause serious or fatal adverse cardiovascular effects, particularly in susceptible individuals.²

Dr. Haller has cited recent studies by other scientists supporting her findings linking ephedra in dietary supplements to cardiovascular stimulant effects resulting in serious health problems or death.³ Dr. Haller concedes, however, that “there have been no large-scale placebo-controlled human clinical trials that have established with 100% certainty that ephedra can cause cardiac hypertrophy.”⁴

On the issue of specific causation, Dr. Haller stated:

After careful evaluation of the information provided to me as well as thorough review of the medical literature, and based on my

²Affidavit of Christine A. Haller, M.D., ¶ 5 (May 20, 2004).

³*Id.* at ¶¶ 7, 11-14.

⁴*Id.* at ¶ 10.

experience as a medical toxicologist with expertise in the area of ephedra alkaloids, I concluded that use of Ripped Force over a period of approximately 6 months was the primary causal factor in development of left ventricular hypertrophy, which led to development of lethal cardiac arrhythmia and the sudden death of Mr. Long. I assert this expert opinion to a reasonable degree of medical certainty.⁵

As part of her differential diagnosis, Dr. Haller opined that neither marijuana nor Effexor “played any significant role in Mr. Long’s demise.”⁶ Dr. Haller also rejected Long’s previous episode of losing consciousness while driving as being related to Long’s death.⁷

Colin M. Bloor, M.D.

Dr. Colin M. Bloor’s credentials as an expert in pathology have not been challenged for purposes of Defendants’ motion. On the issue of specific causation, Dr. Bloor considered Long’s history of congenital aortic stenosis and treatment of that condition by various physicians. Dr. Bloor concluded that Long’s cardiac enlargement occurred between 1998 and the time of death in 1999.

The further increase in cardiac hypertrophy seen at autopsy is not related to the aortic valve disease for it is not described as being significantly stenotic at autopsy....However, the continued use of

⁵*Id.* at ¶ 16.

⁶*Id.* at ¶¶ 17-19.

⁷Opinion of Christine A. Haller, M.D., p. 3 (June 11, 2002).

adrenergic-sympathomimetic agents over time can sustain an increased workload on the heart that will induce cardiac hypertrophy. It is my opinion that the use of such an agent was a contributing factor to the further increase in cardiac hypertrophy seen at autopsy....Thus, it is my opinion that the use of such an agent did contribute to the cause of death in the decedent, Joseph Long.⁸

James H. O'Keefe, M.D.

Dr. James H. O'Keefe is a cardiologist. His expert credentials have not been disputed. Dr. O'Keefe submitted the following opinion on specific causation with a reasonable certainty:

In summary, Mr. Joseph Long had a chronic, stable cardiac condition (bicuspid aortic valve with mild to moderate aortic stenosis). He began to consume 1-2 bottles of a product that was high in ephedrine and caffeine. This is likely to have caused elevation of his systolic blood pressure, prolongation of his QT interval, and thickening of his heart muscle. These changes set the stage for development of a lethal ventricular arrhythmia (probably torsades de pointes, which degenerated ventricular fibrillation). Had this 32-year-old not used the ephedrine-caffeine containing product, he probably would not have developed the milieu for this lethal rhythm and would most likely be alive today.⁹

Dr. O'Keefe also considered Long's use of marijuana and Effexor.

Although Dr. O'Keefe recognized that both agents can have mild cardiovascular effects, they are not associated with the development of ventricular hypertrophy,

⁸Opinion of Colin M. Bloor, M.D. (June 26, 2002).

⁹Opinion of James H. O'Keefe, M.D. (May 6, 2004).

QT prolongation, or sudden cardiac death. Therefore, Dr. O’Keefe concluded that neither Effexor nor marijuana was likely to have played a role in Long’s death.

DEFENDANTS’ EXPERT OPINIONS

M. Donald Whorton, M.D., M.P.H.

Dr. M. Donald Whorton is an expert epidemiologist. Dr. Whorton conducted an epidemiology assessment of ephedra/ephedrine data and the uses of ephedra/ephedrine products.¹⁰ Epidemiology is the branch of medical science that studies the distribution and determinants of health-related states and events in populations. The following is Dr. Whorton’s summary of his findings:

1. No epidemiological study or studies have shown acute and severe side effects associated with the use of products containing ephedra-ephedrine with or without caffeine.
2. The case reports, like those from the FDA Adverse Reports of Metabolife customer complaints, cannot be used to establish causation in acute and severe side effects, such [as] the death in this case.
3. Case reports can be used to develop hypotheses for testing by designed epidemiologic studies.
4. A hypothesis-testing study, like a case-control study, is required to assess the relative risks of acute, severe side-effects associated with use of ephedra/ephedrine with and without caffeine products.

¹⁰Opinion of M. Donald Whorton, M.D., M.P.H. (Nov. 18, 2003).

5. No one can opine, based on the current epidemiological data, that Mr. Long's death was caused by his use of ephedra and caffeine sports drinks.
6. Assessment of Mr. Long's sudden death must include the comorbidities such as congenital [sic] heart disease, marijuana usage, weight-lifting, etc.

Jack W. Snyder, M.D., J.D., Ph.D.

Dr. Jack W. Snyder is a toxicologist and was is presented by Defendants as an expert on epidemiology. Plaintiffs have not agreed that Dr. Snyder is an epidemiology expert. Dr. Snyder reviewed the reports of Plaintiffs' experts, as well as deposition testimony, Long's medical and employment records, the autopsy report, and certain scientific studies concerning ephedrine, caffeine, and prescription medication. Dr. Snyder also considered Long's marijuana use and Effexor prescription. Dr. Snyder opined that Plaintiffs' "proposed causal connection between Mr. Long's use of Ripped Force and his sudden death cannot withstand medical, scientific, and industrial hygiene scrutiny."¹¹

Dr. Snyder listed several reasons for his conclusion. He expanded upon those reasons during his testimony at the hearing on Defendants' motion. Dr. Snyder disputed Plaintiffs' position on general causation because Plaintiff failed to present any epidemiological studies demonstrating a causal connection between

¹¹Opinion of Jack W. Snyder, M.D., J.D., Ph.D. (Oct. 24, 2003).

ephedra/caffeine and cardiac enlargement and/or sudden cardiac death. In layman's terms, Dr. Snyder cited the lack of any scientific study, using generally-recognized epidemiological methodology, that shows what percentage of the general population has any adverse reaction after using a dietary supplement containing ephedra and caffeine. Additionally, there are no epidemiological studies statistically linking a certain percentage of persons with congenital aortic stenosis, who use ephedra/caffeine products, with sudden cardiac death. Dr. Snyder's opinion and testimony criticize Dr. Haller's opinion in specific detail.

Grover M. Hutchins, M.D.

Dr. Grover M. Hutchins is a pathologist and expert on the causes of aortic stenosis. After review of Long's medical records and the autopsy report and histologic slides, Dr. Hutchins found:

Mr. Long had well-documented and severe aortic valve disease due to his congenital bicuspid aortic valve. The marked cardiac enlargement and the histologic changes in the heart and lung are consistent with the obstructive process at the aortic valve. His prior syncopal episode and his sudden death are entirely attributable to his aortic stenosis. There is no discernable role of Ripped Force consumption in his death.¹²

¹²Opinion of Grover M. Hutchins, M.D. (March 17, 2004).

Barry J. Maron, M.D.

Dr. Barry J. Maron is a cardiologist with experience in the cardiovascular causes of sudden death in young people. Dr. Maron reviewed Long's medical history, and Plaintiffs' experts' reports and depositions, and the autopsy report. Dr. Maron found that Long's sudden death "was most probably due to pre-existing, long-standing and clinically and hemodynamically significant aortic valvular stenosis." Dr. Maron based his opinion in part on Long's syncopal episode 15 months prior to death. Dr. Maron concluded:

There is no reason to hypothesize that the ephedrine-containing drink Mr. Long consumed as an exercise supplement contributed in any measurable or important way to his eventual demise or the substantial left ventricular hypertrophy demonstrable at autopsy (which is clearly a consequence of the aortic valve obstruction). Indeed, the echocardiogram obtained 6/18/98, 17 months before death and 5 months before the alleged consumption of "Ripped Force" began showed a left ventricular thickness similar to that reported at autopsy. The argument presented by plaintiff experts that Mr. Long's sudden death was due to ephedrine intoxication is, in my opinion, scientifically unreliable.¹³

ANALYSIS

Defendants argue that the opinions of Plaintiffs' experts on general and specific causation are flawed because they are not based upon reliable, scientific,

¹³Opinion of Barry J. Maron, M.D. (Oct. 2, 2003).

and generally-accepted methodologies as required by the *Daubert*¹⁴ standard. *Daubert* has been adopted by the Delaware Supreme Court. In *Eskin v. Carden*,¹⁵ The Court outlined the five-part test for the admissibility of expert testimony: (i) the witness is “qualified as an expert by knowledge, skill, experience, training or education;” (ii) the evidence is relevant and reliable; (iii) the expert’s opinion is based upon information “reasonably relied upon by experts in the particular field;” (iv) the expert testimony will “assist the trier of fact to understand the evidence or to determine a fact in issue;” and (v) the expert testimony will not create unfair prejudice or confuse or mislead the jury.¹⁶

There are four nonexclusive factors that the trial court may consider in assessing the reliability of expert opinions: (1) whether the opinion at issue is susceptible to testing and has been subjected to such testing; (2) whether the opinion has been subjected to peer review; (3) whether there is a known or potential rate of error associated with the methodology used and whether there are standards controlling the technique’s operation; and (4) whether the theory has

¹⁴*Daubert v. Merrill Dow Pharmaceuticals, Inc.*, 509 U.S. 579 (1993).

¹⁵842 A.2d 1222 (Del. 2004).

¹⁶*Id.* at 1227, quoting *Cunningham v. McDonald*, 689 A.2d 1190, 1193 (Del. 1997).

been accepted in the scientific community.¹⁷ This list, however, is not exclusive. The trial court has broad discretion to consider a variety of other factors.¹⁸ The court's function as the gatekeeper – to insure the reliability and relevancy of expert testimony – must be tied to the facts of a particular case.¹⁹

For purposes of Defendants' motion to exclude the testimony of Plaintiffs' experts, the dispositive issue is whether in the absence of epidemiological studies, Plaintiffs' experts can demonstrate: (1) general causation between ephedra/caffeine use and adverse cardiac results; and (2) specific causation between Long's use of Ripped Force, a dietary supplement containing ephedra and caffeine, and Long's sudden cardiac death. It is undisputed that to date, there have been no large-scale placebo-controlled human clinical trials that have established to 100% certainty that ephedra can cause cardiac hypertrophy and sudden cardiac death.

Plaintiffs' experts have relied upon factors other than the type of epidemiological studies that would have been conducted if Ripped Force were a prescription medication instead of a dietary supplement. For example, attached as

¹⁷*Daubert*, 509 U.S. at 590.

¹⁸*Kumho Tire Co., Ltd. v. Carmichael*, 526 U.S. 137, 150 (1999).

¹⁹*Id.* at 150-52.

exhibits to Dr. Haller's Affidavit are numerous recent scientific studies supporting findings that ephedra in sports products and dietary supplements produces cardiovascular stimulant effects and can result in stroke, sudden death, and acute myocardial infarction temporarily associated with the use of ephedra. Ephedrine and related alkaloids also are known as "sympathomimetics". Plaintiffs have supplied several studies finding that ephedrine and other sympathomimetics can produce acute cardiac arrhythmias and can sometimes lead to death. Dr. Haller opined that there is no scientific basis to presume that ephedrine taken as a dietary supplement would have different clinical effects than ephedra in prescription drug form. Case studies compiled by Plaintiffs' experts and others have associated cardiac hypertrophy with ephedra.

On December 30, 2003, the United States Food and Drug Administration ("FDA") announced its decision to ban sales of all ephedra products finding that the benefits were outweighed by risks of adverse cardiovascular effects. The FDA, however, noted that the risk of side effects had not been precisely quantified. The FDA's decision is consistent with the position of numerous national organizations that have recognized a connection between the use of ephedra products and adverse results, such as cardiovascular problems and death. These organizations include the American Medical Association, American Heart Association,

American Society for Clinical Pharmacology and Therapeutics, American Society of Health-System Pharmacists, American Academy of Family Physicians, Health Canada, National Collegiate Athletic Association, U.S. Navy, U.S. Olympic Committee, Marine Corps, and National Football League.

Although there is a split of authority, other jurisdictions have found that epidemiological studies are not necessary as a threshold for admitting an expert's opinion on causation.²⁰ As a matter of public policy, courts should not be hampered in the search for truth by the rigid proposition that no expert, however qualified, can reliably opine on the causal link between a toxic substance and injury without epidemiological studies conducted according to strict guidelines.

The first several victims of a new toxic tort should not be barred from having their day in court simply because the medical literature, which will eventually show the connection between the victims' condition and the toxic substance, has not yet been completed. If a properly qualified medical expert performs a reliable differential diagnosis through which, to a reasonable degree of medical certainty, all other

²⁰See, e.g., *Westberry v. Gislaved Gummi AB*, 178 F.3d 257, 262 (4th Cir. 1999) (expert opinion based on differential diagnosis and temporal relationship to chemical exposure found to be reliable, even though no peer-reviewed published studies, no laboratory data, and no epidemiological studies); *Heller v. Shaw Industries*, 167 F.3d 146, 154-55 (3rd Cir. 1999) (expert not required to rely upon definitive published studies before concluding particular substance was most likely cause of plaintiff's illness); *Kennedy v. Collagen Corp.*, 161 F.3d 1226, 1229 (9th Cir. 1998) (trial court abused its discretion by excluding expert testimony based on reliable methodology simply because there were no epidemiological studies).

possible causes of the victims' condition can be eliminated, leaving only the toxic substance as the cause, a causation opinion based on that differential diagnosis should be admitted.²¹

In determining the reliability of expert testimony, it is within the discretion of the trial court to exclude evidence of causation based solely on the expert's evaluation of case reports and differential diagnoses.²² Nevertheless, courts have admitted expert testimony when a differential diagnosis is supported by scientific and clinical studies linking the allegedly dangerous substance to harmful effects.²³

All three of Plaintiffs' experts considered other possible causes of Long's death. Each specifically outlined the reasons for ruling out Long's marijuana use, Effexor prescription, and medical history. Clearly, Defendants' experts

²¹*Turner v. Iowa Fire Equipment Co.*, 229 F.3d 1202, 1208-209 (8th Cir. 2000).

²²Differential diagnosis is the process by which physicians rule in all scientifically plausible causes of injury and then rule out the least plausible causes of injury until the most likely cause remains. *Glastetter v. Novartis Pharmaceuticals*, 252 F.3d 986, 989 (8th Cir. 2001).

²³*Hollander v. Sandoz Pharmaceuticals Corp.*, 289 F.2d 1193, 1210-11 (10th Cir. 2002); *see, e.g., Zuchowicz v. United States*, 140 F.3d 381, 385-87 (2d Cir. 1998)(affirming admission of differential diagnosis based in part on scientific articles regarding the effects of a drug); *Kennedy v. Collagen Corp.*, 161 F.3d 1226, 1228-30 (9th Cir. 1998) (holding that the district court abused its discretion in excluding expert opinion based on differential diagnosis when the diagnosis was supported by scientific and clinical studies regarding the connection between collagen and autoimmune disorders).

categorically disagree with Plaintiffs' experts' opinions. As to the issue of general and specific causation, this case presents a classic battle of the experts.

CONCLUSION

Under the *Daubert* standard and Delaware cases elaborating on that standard, Plaintiffs' experts are qualified in their scientific specialties, and present relevant and reliable opinions that will assist the trier of fact without unfair prejudice or confusion for the jury. On the issue of general causation, Plaintiffs' have presented expert testimony based upon scientific studies, including case studies, from numerous well-established and credible sources, some of which have been subject to peer review. Epidemiological studies are not required in every case as a threshold for the admission of an expert opinion as to the general causal relationship between an allegedly toxic substance and a plaintiff's injury or death. Plaintiffs' expert opinions on specific causation are based upon accepted scientific methodology.

THEREFORE, Defendants Joint Motion for Order Excluding the Opinions of Plaintiffs' Experts on Causation Issues is hereby **DENIED**.

IT IS SO ORDERED.

The Honorable Mary M. Johnston