IN THE SUPREME COURT, STATE OF WYOMING

2004 WY 73

APRIL TERM, A.D. 2004

June 24, 2003

JEFF EASUM and LYNN EASUM, Appellants (Plaintiffs), v. CLAY MILLER, d/b/a PRIME POWER & COMMUNICATIONS, LLC, Appellee (Defendant).	)	No. 02-242

Appeal from the District Court of Park County
The Honorable Dan Spangler, Retired, Judge

Representing Appellant:
John R. Hursh of Central Wyoming Law Associates, P.C., Riverton, Wyoming

Representing Appellee:
Judith Studer of Schwartz, Bon, Walker & Studer, LLC, Casper, Wyoming

Before HILL, C.J., and GOLDEN, LEHMAN, KITE, and VOIGT, JJ.

GOLDEN, Justice.

[¶1] The primary issue in this appeal is the reliability of the differential diagnosis technique for determining general and specific causation in a general negligence action. Differential diagnosis determined that the severe illness suffered by Appellant Jeff Easum (Easum) was caused by numerous electrical shocks that he received while working on his family-owned dairy. In a summary judgment ruling, the trial court determined that this particular differential diagnosis was inadmissible because it was unreliable.

[¶2] Easum began suffering severe illness shortly after Appellee Clay Miller's company, Prime Power and Communications, LLC, (Prime Power) replaced a transformer near Easum's family-owned dairy. An unconnected neutral line was determined to be the cause of stray voltage found throughout the dairy that was administering shocks to Easum as he worked at the dairy. After the neutral line was properly connected, the stray voltage and shocks ceased; however, Easum continued to suffer from his symptoms and was ultimately diagnosed with reflex sympathetic dystrophy (RSD) caused by electrical injury. Easum and his wife (Easums) brought suit against Prime Power for personal injury and property damages.

[¶3] Prime Power settled with Easums for property damages; however, it moved for summary judgment on other damages. Easums' suit was dismissed by grant of summary judgment based upon a determination that their expert's testimony regarding specific causation was inadmissible as unreliable. The trial court ruled that the expert's differential diagnosis technique insufficiently satisfied reliability standards because the scientific methodology used to determine that low level electric current could cause RSD was inadequate. We reverse and remand for trial.

ISSUES

[¶4] Easums present the following statement of the issues:

> 1. Did the trial court err in rejecting the Appellants' treating physician's opinions relating to medical causation resulting from their properly performed differential diagnosis as insufficient to satisfy the reliable scientific methodology requirements of *Daubert v. Merrill Dow Pharmaceuticals*, 509 U.S. 579, 113 S.Ct. 2786, 125 L.Ed.2d 469 (1993) (hereinafter *Daubert*) and *Bunting v. Jamieson*, 984 P.2d 467 (Wy. 1999) (hereinafter *Bunting*).
>
> 2. Did the trial court err by redefining medical causation to require general causation based peer reviewed medical literature in addition to the medical causation derived from a differential diagnosis before treating physician testimony will be allowed?

> 3. In a case when the Appellants' treating physicians' opinions on causation were challenged by the Appellee's forensic experts on their credibility and upon the degree or level of electrical exposures required to cause neurological injury, was it proper for the Trial Court to find that there were no disputed material facts for jury determination and enter a Summary Judgment in this matter?

Appellees Miller and Prime Power state the issues as:

> 1. Did the district court properly grant summary judgment to the defendant on the basis that plaintiffs could not prove that defendant's conduct was the proximate cause of Plaintiff Jeff Easum's injuries?
>
> > (a) Did the district court properly find that plaintiffs' expert opinion that exposure to low levels of electricity causes reflex sympathetic dystrophy ("RSD"), to be based on speculation and contrary to well accepted science?
> >
> > (b) Is a medical doctor allowed to testify as to causation based on exposure to electricity when he lacks a basic understanding of the physiological effect of electricity on the human body and such conclusion is not based on sound methodology or good science?
> >
> > (c) Is a causation opinion by a medical doctor exempted from the basic requirements of *Daubert v. Merrell Dow Pharmaceuticals*, 509 U.S. 571 (1993) and *Bunting v. Jamieson*, 984 P.2d 467 (Wyo. 1999) when there exists no sound scientific or medical basis as to the cause of his differential diagnosis?

FACTS

[¶5] As required by our standard of review for summary judgment, we view the record, and the reasonable factual inferences drawn from it, in the light most favorable to the Easums as the non-moving party. *Roussalis v. Wyoming Medical Center, Inc.*, 4 P.3d 209, 216 (Wyo. 2000).

[¶6] Easum works and lives at his family-owned dairy. After the dairy decided to upgrade its electrical service, the utility company contracted with Prime Power, a local electrical

contractor, to upgrade the transformer that serviced the dairy. On February 26, 1999, Prime Power performed electrical work and hung a transformer on an electrical pole near the ranch. Prime Power admits failing to connect the neutral line to the transformer. Before that failure was discovered, however, the dairy cattle were observed reacting in a manner consistent with animals receiving electrical shocks, such as not eating, not wanting to return to the barn, and not cooperating. Easum also experienced numerous shocks. On March 16, 1999, another electrical contracting firm began investigating the problem and discovered the failure to connect the neutral wire. Prime Power returned to the ranch and, after that connection was made, no further electrical shocks were experienced by Easum or observed to be affecting cattle.

[¶7] Easum first experienced shocks in the dairy on or about March 1, 1999. Between that date and March 17, 1999, Easum experienced numerous shocks while in the dairy milking stalls, the sinks and the tanks. He received the worst shocks when his hands were in water. On March 12, 1999, Easum developed symptoms of nausea, tremors, headache, and extreme fatigue. His illness caused him to stay home the next day, and his symptoms subsided. He returned to the dairy on March 15, 1999, and was again shocked causing his symptoms to reappear immediately. After the electricians connected the neutral wire, the electric shocks were no longer experienced; however, Easum's symptoms continued and worsened.

[¶8] Before receiving the shocks, thirty-year-old Easum's only known health problem was slightly elevated blood pressure. When his symptoms did not subside, his wife called their family physician, Dr. Wurzel, on March 26, 1999, to discuss whether the effects of electrical shock might be long-term or even permanent. Easum saw Dr. Wurzel on May 21, 1999, and the doctor noted numerous symptoms including fatigue, lack of ambition, tremors, difficulties with fine motor skills, vision blurring, lack of libido, weakness, and increased blood pressure. Later, Easum returned with these symptoms and headaches and swollen, painful hands. Laboratory tests were conducted which indicated some abnormalities. Dr. Wurzel referred Easum to Dr. Norris, a board certified rehabilitative medicine physician and psychiatrist.

[¶9] Dr. Norris noted that these many symptoms occurred after repeated low voltage electrical shocking over a twenty-day period and prepared an extensive medical report. He ordered an EMG and MRI. The EMG returned abnormal, and the MRI indicated a brain cyst. Easum was referred to another specialist who determined that the brain cyst was not causing his symptoms. This specialist also noted that the onset of symptoms occurred soon after exposure to low level electric shocks.

[¶10] Easum was then referred to a rheumatologist, who again did extensive diagnostic testing and was able to rule out rheumatoid arthritis, which had been suspected as the cause of the laboratory test abnormalities. After the extensive reports of these specialists were discussed with the Easums by Dr. Norris and Dr. Wurzel, Easum was referred to Dr. Hooshmand, a neurologist in Florida, specializing in electrical injury type cases. Dr. Hooshmand has identified electrical injury in thirteen other dairy farmers from different parts of the country suffering similar symptoms as Easum and concluded in all that "stray voltage" was the cause of their medical condition.

[¶11] Under the direction of Dr. Hooshmand, Easum underwent fourteen days of extensive diagnostic testing, including qualitative sensory testing, infrared thermography imaging on two occasions, electroencephlography tests, visual evolved response tests, brain mapping tests, brain stem evoke response tests and neuropsychometric testing. The electroencephlogram test was abnormal, and another specialist, Dr. Weise, reported it to be consistent with electrical injury. The thermography test was also abnormal and determined consistent with tissue responses to electrical injury. From the use of differential diagnosis technique, Dr. Hooshmand concluded that Easum was suffering from Reflex Sympathetic Dystrophy (RSD) and an immune system dysfunction. Doctors Norris and Wurzel concurred in that diagnosis. Easum was prescribed treatment that is administered and monitored by the latter two doctors and, while he has shown improvement, continues to be afflicted by many of his symptoms.

[¶12] Dr. Hooshmand concluded that the cause of Easum's RSD was his exposure to low levels of electrical current; however, RSD has no known etiology other than heredity and repetitive strain injury. Easum, nevertheless, filed suit against Appellees and presented Dr. Hooshmand as his expert on causation. Appellees moved for summary judgment on the basis that the technique of differential diagnosis is unreliable for determining general causation and contended that this technique was too unreliable to admit regarding the specific causation because it has not been scientifically proved that RSD can result from low levels of electrical current.

[¶13] The trial court determined that the technique of differential diagnosis is reliable only if the remaining cause is one that is scientifically established and then concluded that the basic research had not been conducted in this case. The trial court stated:

> The scientific method consists of 4 steps: gathering information, classifying those data, forming a theory or prediction of behavior, and testing that theory. Dr. Hooshmand skipped the first two steps and arrived at a conclusion based upon the common fallacy in reasoning known as "after this, therefore, because of this."
>
> Dr. Hooshmand has treated 13 dairy farmers with similar symptoms. Even with this limited sample, there has been no rigorous collection of data. We are not told the medical histories of the patients, the durations and intensities of electrical exposure, the reactions of others who were exposed, and the incidence of this condition among the general population compared to the incidence among dairy farmers or some other group exposed to low levels of electricity.

[¶14] The trial court dismissed Easums' case authority supporting the differential diagnosis as distinguishable either because causation was not an issue in those cases or because the causation diagnosis was supported by medical literature, peer-reviewed articles, clinical

trials, and product studies. The trial court concluded that the claim of injury from exposure to low levels of electrical current was not based upon science but was only a matter of speculation. Summary judgment was granted for Appellees, and this appeal followed.

DISCUSSION

Standard of Review

[¶15] Summary judgment is appropriate when "the pleadings, depositions, answers to interrogatories, and admissions on file, together with the affidavits, if any, show that there is no genuine issue as to any material fact and that the moving party is entitled to a judgment as a matter of law." *Roussalis*, 4 P.3d at 228. In reviewing a summary judgment, we do not accord any deference to the district court's decisions on issues of law, and we examine de novo the entire record--the parties' submissions of evidence--in the light most favorable to the parties who opposed the motion. *Id.* at 229. We give the Easums "the benefit of every reasonable inference and every doubt," which may be drawn from the materials either supporting or opposing the motion. *Id.* (quoting *Fiscus v. Atlantic Richfield*, 773 P.2d 158, 161 (Wyo. 1989)).

Standard for Admission of Expert Opinion

[¶16] A qualified expert witness may testify about scientific, technical, or specialized knowledge if such testimony will help the jury understand the case. W.R.E. 702. When determining the admissibility of expert testimony, the district court's gatekeeping function requires it to determine whether the methodology or technique used by the expert to reach his conclusions is reliable and, if so, the court must then determine whether the proposed testimony "fits" the facts of the particular case. *Bunting v. Jamieson*, 984 P.2d 467, 471-72 (Wyo. 1999) (citing *Daubert v. Merrell Dow Pharmaceuticals, Inc.*, 509 U.S. 579, 591-93, 113 S.Ct. 2786, 2796, 125 L.Ed.2d 469 (1993)).

[¶17] *Daubert* provided a non-exclusive list of four criteria to be used to guide the trial court's assessment of reliability:

> 1) whether the theory or technique in question can be and has been tested;
> 2) whether it has been subjected to peer review and publication;
> 3) its known or potential rate of error along with the existence and maintenance of standards controlling the technique's operation; and
> 4) the degree of acceptance within the relevant scientific community.

Bunting, 984 P.2d at 472. Because these criteria cannot be applied in every case, "[t]he initial step in reviewing the admissibility of expert testimony is the determination whether the *Daubert* factors apply to the specific testimony at issue. Where they are reasonable measures of reliability, these factors should be considered." *Id.* at 475.

[¶18] It cannot be overemphasized that methodology should be distinguished from the conclusion of the expert. A trial judge need not and should not determine the scientific validity of the conclusions offered by an expert witness. Rather, to decide admissibility, the trial judge should only consider the soundness of the general scientific principles or reasoning on which the expert relies and the propriety of the methodology applying those principles to the specific facts of the case. *Id*. at 472-73.

[¶19] In *Kumho Tire Co., Ltd. v. Carmichael*, 526 U.S. 137, 119 S.Ct. 1167, 143 L.Ed.2d 238 (1999), the United States Supreme Court further clarified the scope of *Daubert* and discussed additional factors that may be used by a trial court in fulfilling its gatekeeping function. *Bunting*, 984 P.2d at 471. *Bunting* then considered specific factors, including:

> 1) The experience and specialized expertise of the proffered expert;
> 2) Whether or not that expert is testifying about matters occurring "naturally and directly" out of research conducted independent of litigation; and
> 3) Any "non-judicial" utilization of the expert methodology in question.

Id. at 472 (citing *Ambrosini v. Labarraque*, 101 F.3d 129, 140 (D.C. Cir. 1996); *Daubert*, 43 F.3d 1311, 1317 (9th Cir.) (on remand), *cert. denied*, 516 U.S. 869 (1995); and *In re Paoli R.R. Yard PCB Litigation*, 35 F.3d 717, 742 n.8 (3d Cir. 1994)).

[¶20] The United States Supreme Court favored admission of evidence on the borderline. "Vigorous cross-examination, presentation of contrary evidence, and careful instruction on the burden of proof are the traditional, and appropriate means of attacking shaky but admissible evidence." *Daubert*, 509 U.S. at 596, 113 S.Ct. at 2798. At the same time, the Court recognized the significant difference between "the quest for truth in the courtroom and the quest for truth in the laboratory." *Id.* at 596-97, 113 S.Ct. at 2798. Scientific inquiry must necessarily be broad and far-reaching, with the reliability of theories under continuous study and revision. Resolution of a legal dispute, on the other hand, involves binding, final judgments that cannot be based on conjecture. Consequently, there may well be "authentic insights and innovations" of science that are nonetheless inadmissible in a court of law. *Id.* at 597, 113 S.Ct. at 2798-99.

[¶21] We review de novo the question whether the district court performed its gatekeeper role and applied the proper legal standard in admitting or excluding an expert's testimony. We then review for an abuse of discretion a district court's decision to admit or reject expert testimony. *Seivewright v. State*, 7 P.3d 24, 29 (Wyo. 2000); *Springfield v. State*, 860 P.2d

435, 438-39 (Wyo. 1993); *Betzle v. State*, 847 P.2d 1010, 1022 (Wyo. 1993). We agree with *Kumho Tire Co.* that the trial court's broad discretion applies both in deciding how to assess an expert's reliability, including what procedures to use in making that assessment, as well as in making the ultimate determination of reliability. *Kumho Tire Co.*, 526 U.S. at 152, 119 S.Ct. at 1176. Accordingly, we will not disturb the district court's ruling unless it has failed to exercise sound judgment with regard to what is right under the circumstances or has acted arbitrarily or capriciously. *Vaughn v. State*, 962 P.2d 149, 151 (Wyo. 1998).

Electrical Current

[¶22] Creating an electric circuit is a function of force which is measured in voltage, current which is measured in amperes, and resistance which is measured in ohms.[1] Simply stated, electricity involves the flow of energy (electrons) along the path of least resistance toward a natural ground. *See Schlader v. Interstate Power Co.*, 591 N.W.2d 10, 12 (Iowa 1999); *see also* W.B. Saunders, Nave & Nave *Physics For the Health Sciences, Electric Shock Hazards* ch. 14 (3d ed. 1985). All objects are either resistors or conductors. The electric current is the most important physiological variable for determining the severity of an electric shock. However, this current is in turn determined by the driving voltage and the resistance of the path that the current follows through the body. A voltage that produces only a mild tingling sensation under one circumstance can be a lethal shock hazard under other conditions. This uncertainty is caused because although the skin acts as a natural resistor to flow, *i.e.*, normal skin has a resistance of 25,000 ohms and calloused skin has a resistance of 2,000,000 ohms, wet skin has a resistance of only 1,500 ohms. One hundred and twenty volts delivered to a calloused finger would probably cause a tingling sensation, that voltage delivered to dry skin would cause a painful shock, but that same voltage to wet skin could prove to be a lethal shock. *Id.*

[¶23] The record shows that when electricians measured voltage in the areas where Easum was working, their readings were consistently between thirty and fifty volts, with the highest reading at sixty-seven volts. The resistance is unknown as is the level of current; however, Easum stood in water and placed his hands in water so presumably resistance was low. As we have already seen, the margin between a minor shock with no effect and electrocution is very narrow. The issue of stray voltage in connection with dairies and the effect on dairy herds is not new to courts and is explained as follows:

> All electricity leaving an electrical substation must return to that substation in order to complete a circuit. Unless that circuit is completed, electricity will not flow. The current leaves the

[1] "The word 'amp' is a household word. A French physicist named Andre Ampere (1775-1836) is credited with describing the flow of electrical current; his name became attached to the description of electrical flow and the word 'ampere' is the standard measure of electric current everywhere. An ampere is equivalent to a flow of one coulomb per second or to the steady current produced by one **volt** applied across a resistance of one **ohm** (Webster's 7th New Collegiate Dictionary, 1967)." *Amp, Inc. v. Foy*, 379 F.Supp. 105, 108 (W.D.N.C. 1974) (emphasis added).

> substation on a high voltage line which eventually connects to some electrical 'appliance.' After exiting the 'appliance' that current must return to the substation. The neutral-grounded network provides the returning current two choices. Either it can return via the neutral line, which accounts for the second wire on our electrical poles, or it can return through the ground. These two pathways comprise the grounded-neutral network. Electricity flows through the path of lowest resistance. If there exists more resistance in the neutral line than in the ground, the current will flow through the ground to return to the substation. Neutral-to-earth voltage or stray voltage will occur when current moves from either the neutral line to the ground or from the ground to the neutral line. It uses a cow as a pathway if that animal happens to bridge the gap between the two. A cow's hooves provide an excellent contact to the earth while standing on wet concrete or mud, while at the same time the cow is contacting the grounded-neutral system consisting of items such as metal stanchions, stalls, feeders, milkers, and waterers. The current simply uses the cow as a pathway in its eventual return to the substation. Apparently very slight voltages can affect cattle. Evidence [has] suggested anything greater than one volt can be catastrophic to a dairy farm.

Kaech v. Lewis County Public Util. Dist., 23 P.3d 529, 533 n.3 (Wash. App. 2001).

Reflex Sympathetic Dystrophy

[¶24] Reflex sympathetic dystrophy was first described by medical authorities in 1864 and, until recently, was considered a disorder of the sympathetic nervous system. This network of nerves, located alongside the spinal cord, controls certain functions in our bodies, such as the opening and closing of blood vessels and sweat glands. The disorder is difficult to diagnose because it has many variations, often follows minor injury, and evolves and spreads over time. The disorder is unique in that it simultaneously affects the nerves, skin, muscles, blood vessels, and bones and is characterized by a devastating amount of pain, swelling, discoloration, and stiffness. Robert J. Schwartzman, M.D., *New Treatments for Reflex Sympathetic Dystrophy*, New Eng. J. Med., Vol. 343, No. 9 (Aug. 31, 2000).

[¶25] A new name, the complex regional pain syndrome, is gaining recognition because the role of the sympathetic nervous system in many aspects of the illness is not clear, and dystrophy may not occur in all patients. The two types of complex regional pain syndrome are distinguished by whether a definable nerve injury is present. In the early stages of reflex sympathetic dystrophy, the pain is more severe than would be expected for the degree of tissue damage, and the pain spreads progressively from a nerve to a regional distribution. The cause of RSD is unknown. As the illness evolves, pain becomes intense and chronic; nails,

hair, skin and bone change; and weakness, swelling, tremors, sleep disruptions, anxiety and depression may be experienced. *Id.*

Differential Diagnosis

[¶26] Dr. Hooshmand presented a medical opinion that Easum's condition was caused by receiving a significant number of electrical shocks over a sustained period of time. Dr. Hooshmand's research in this case was not "conducted independent of the litigation," and was developed "expressly for purposes of testifying." Also, his research was not "subjected to normal scientific scrutiny through peer review and publication." Ordinarily, these *Daubert* factors would indicate unreliability unless good reason existed to explain the absence of independence, peer review and publication. *Clausen v. M/V New Carissa*, 339 F.3d 1049, 1056 (9th Cir. 2003). In the case of Dr. Hooshmand, the trial court found it significant that his causation diagnosis was unsupported by medical literature, peer-reviewed articles, clinical trials, and product studies.

[¶27] Here, medical ethical rules do not permit conducting clinical testing that administers low levels of sustained electrical current to humans to see if RSD results. Dr. Hooshmand examined and treated a patient complaining of symptoms consistent with RSD following sustained exposure to electric shock and, later, that patient filed suit. Similarly, there may exist good reason why an expert's research may not have been published. *Id.* In this case, the apparent reason is that Dr. Hooshmand's research involving the phenomenon of electrical injury to dairy farmers is both recent and singular.

[¶28] In the absence of these reliability factors, an expert may use an objective source to show that the scientific evidence method has been followed by at least a recognized minority of experts in their field. *Id.* Objective sources may include "a learned treatise, the policy statement of a professional association, a published article in a reputable scientific journal or the like." *Id.* Here, Dr. Hooshmand followed a differential diagnosis method to determine the cause of Easum's condition.

[¶29] "'Differential diagnosis' refers to the process by which a physician 'rules in' all scientifically plausible causes of the plaintiff's injury. The physician then 'rules out' the least plausible causes of injury until the most likely cause remains. The remaining cause is the expert's conclusion."[2] *Hollander v. Sandoz Pharmaceuticals*, 289 F.3d 1193, 1209 (10th Cir. 2002) (citation omitted). The Fourth Circuit describes it this way:

> Differential diagnosis, or differential etiology, is a standard scientific technique of identifying the cause of a medical

[2] This definition was provided in the context of a product liability claim. The federal courts appear to be in dispute whether the "rule in before rule out" method applies in all types of claims and some apply the rule differently depending on whether the claim is products liability, toxic torts, or general negligence. *Hollander*, 289 F.3d at 1210.

> problem by eliminating the likely causes until the most probable one is isolated. A reliable differential diagnosis typically, though not invariably, is performed after physical examinations, the taking of medical histories, and the review of clinical tests, including laboratory tests, and generally is accomplished by determining the possible causes for the patient's symptoms and then eliminating each of these potential causes until reaching one that cannot be ruled out or determining which of those that cannot be excluded is the most likely.

Westberry v. Gislaved Gummi AB, 178 F.3d 257, 262 (4th Cir. 1999) (internal quotation marks omitted). Most physicians use the term differential diagnosis to describe the process of determining which of several diseases is causing a patient's symptoms while courts use the term more generally to describe the process by which causes of the patient's condition are identified. *Clausen*, 339 F.3d at 1057 n.4; *see, e.g., Westberry*, 178 F.3d at 262.

[¶30] In general terms, the reliability of differential diagnoses is easily resolved. "Most circuits have held that a reliable differential diagnosis satisfies *Daubert* and provides a valid foundation for admitting an expert opinion. The circuits reason that a differential diagnosis is a tested methodology, has been subjected to peer review/publication, does not frequently lead to incorrect results, and is generally accepted in the medical community." *Turner v. Iowa Fire Equip. Co.*, 229 F.3d 1202, 1208 (8th Cir. 2000); s*ee Westberry*, 178 F.3d at 262-63. Physicians routinely determine medical causation by this technique, and we have previously determined that the technique of differential diagnosis for establishing causation can be reliable under *Daubert*. *See Reichert v. Phipps*, 2004 WY 7, ¶18, 84 P.3d 353, ¶18 (Wyo. 2004).

[¶31] Although courts have reached contrasting conclusions about reliability under *Daubert*, the *Daubert* reliability inquiry is case-specific, and, in general terms, the reliability of a *proper* differential diagnoses need not be addressed. *Hollander*, 289 F.3d at 1210 (citing *Kumho Tire Co.*, 526 U.S. at 150, 119 S.Ct. at 1175); *see also Carlson v. Okerstrom*, 675 N.W.2d 89, 105 (Neb. 2004). Our task is only to decide whether the trial court abused its discretion by characterizing the specific diagnosis at issue here as unreliable. *Hollander*, 289 F.3d at 1210. "A fundamental assumption underlying this method is that the final, suspected 'cause' remaining after this process [differential diagnosis] of elimination must actually be capable of causing injury. That is, the expert must 'rule in' the other suspected cause as well as 'rule out' other possible causes. And, of course, expert opinion on this issue of general causation must be derived from scientifically valid methodology." *Id.* at 1211 (quoting *Siharath v. Sandoz Pharmaceuticals*, 131 F.Supp.2d 1347, 1362-63 (N.D. Ga. 2001).

[¶32] Reliable differential diagnosis alone may provide a valid foundation for a causation opinion, even when no epidemiological studies, peer-reviewed published studies, animal studies, or laboratory data are offered in support of the opinion. *Hollander*, 289 F.3d at 1212 (citing *Westberry*, 178 F.3d at 262). As the Eighth Circuit has written:

> We do not believe that a medical expert must always cite published studies on general causation in order to reliably conclude that a particular object caused a particular illness. 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 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.

Hollander, 289 F.3d at 1212 (quoting *Turner*, 229 F.3d at 1209).

[¶33] "Even with all the advances of medical science, the practice of medicine remains an art. A properly conducted and explained differential diagnosis is not 'junk science.' If a differential diagnosis provides a sufficient basis on which to prescribe medical treatment with potential life-or-death consequences, it should be considered reliable enough to assist a fact finder in understanding certain evidence or determining certain fact issues." *Coastal Tankships, U.S.A., Inc.. v. Anderson*, 87 S.W.3d 591, 604-05 (Tex. App. 2002). Courts that accept the differential diagnosis as reliable will permit it to establish legal causation when applied to an illness with some unknown causes. "Such a bright-line rule would be unduly restrictive in a world in which many things are not or cannot be known with absolute certainty." *Id.* at 605 n.25; *see Westberry*, 178 F.3d at 265; *c.f.*, *Cooper v. Smith & Nephew, Inc.*, 259 F.3d 194, 202 (4th Cir. 2001) (outside toxic-tort context, relying on *Westberry* for same). "A differential diagnosis that fails to take serious account of other potential causes may be so lacking that it cannot provide a reliable basis for an opinion on causation. However, a medical expert's causation conclusion [based on a differential diagnosis] should not be excluded because he or she has failed to rule out every possible alternative cause of a plaintiff's illness. The alternative causes suggested by a defendant affect the weight that the jury should give the expert's testimony and not the admissibility of that testimony." *Westberry*, 178 F.3d at 265 (citation and internal quotation marks omitted); *see also Cooper*, 259 F.3d at 202.

[¶34] Depending on how the injury occurred, a tort action involves either general negligence, product liability or a toxic tort. Most of the law that we have recited above involved either product liability or toxic tort actions prosecuted in federal courts where federal courts require that proof of causation be produced for two components, general and specific.[3] A. A. White, *The Admissibility of Differential Diagnosis Testimony to Prove*

[3] General causation deals with whether the substance at issue, *e.g.*, silicone, can cause diseases or disorders in people in general. Specific causation focuses upon whether the substance, *e.g.*, silicone, was in fact the cause of the ailments or symptoms in the particular patient. Claims must provide admissible evidence of both general and specific causation for these two types of claims. White, *supra*, at 110.

Causation in Toxic Tort Cases: The Interplay of Adjective and Substantive Law, 64 Law & Contemp. Probs. 107, 110 (2001). We have previously held that electricity is not a product and plainly this case does not involve toxic tort allegations. *Wyrulec Co. v. Schutt*, 866 P.2d 756, 760 (Wyo. 1993). Easum's injuries present a general tort claim; however, we believe that this case requires that we determine both general and specific causation.

Reliability of Dr. Hooshmand's Differential Diagnosis

[¶35] Dr. Hooshmand's conclusions established both general and specific causation. He established general causation with evidence that electrical shock can cause harm to humans receiving them and established specific causation by evidence that the electrical shocks received by Easum did in fact cause the onset of his RSD. As our previous discussion indicates, the harm produced on dairy farms by stray voltage is well-established. For many years, Dr. Hooshmand has studied the effects of electrical injury on human patients and concluded that electrical injury can produce disease or disorders in patients. Among his patients were a number of dairy farmers, all of whom received electrical shocks of varying degrees and later suffered illnesses. Dr. Hooshmand believed that the shocks caused the illnesses in those particular patients. Studies show that electric shock can cause trauma to nerve and tissue, and animal studies, usually involving dairy herds, show that very low voltages can have devastating physical effects upon cattle. Dr. Hooshmand properly relied upon studies finding that electrical voltage can seriously harm dairy herds and his own studies as support for the general proposition that electricity, even at low levels, can harm humans. Whether his conclusion is sound presents a jury question; however, reliance upon these studies is not an improper methodology.

[¶36] Dr. Hooshmand determined that Easum had suffered illness as the result of harm caused by sustained incidences of electric shock and further concluded that Easum suffered from RSD. From this conclusion, the district court determined that no reliable scientific methodology established that low levels of electric current will cause RSD. These last two conclusions, however shaky, present jury questions. The district court's proper focus should have been the reliability of Dr. Hooshmand's opinion that Easum's condition was caused by sustained incidences of electric shock. To make that determination, the focus must be on whether Dr. Hooshmand properly used the technique of differential diagnosis to decide that sustained electric shocks produced illness in Easum.

[¶37] A differential diagnosis is properly performed when objective tests are used to rule out as many causes as possible. Easum's medical history indicated that he had no symptoms before experiencing shocks and began experiencing symptoms while receiving shocks over a sustained period. Several doctors and Dr. Hooshmand performed numerous objective tests that ruled out other causes of injury and confirmed physical injury consistent with electrical shock. Dr. Hooshmand reviewed Easum's medical history, conducted days of physical examination and testing, relied upon this testing and that of other specialists to eliminate other possible diagnoses, and reviewed electrical injury information and medical studies. Dr. Hooshmand properly evaluated and diagnosed Easum using standard medical procedure and

his methodology was based upon valid scientific method. Although the district court believed that the timing between Easum's electrical shocks and the onset of his symptoms discredited Dr. Hooshmand's diagnosis, a temporal relationship remains a factor that can support Dr. Hooshmand's conclusion.

[¶38] Even though science remains unsure how RSD develops, Dr. Hooshmand has personally conducted research in this area and has had numerous patients with this condition. Dr. Hooshmand does not believe that Easum's condition is unique to dairy farmers and has researched this particular injury to this particular group of patients. Dr. Hooshmand's conclusions may indeed be wrong; however, his methodology is reliable and the accuracy of his conclusions presents a jury question that must be presented at trial.

[¶39] The district court's order is reversed, and this case is remanded for trial.