RENDERED: July 13, 2001; 2:00 p.m.
NOT TO BE PUBLISHED

Commonwealth Of Kentucky

Court Of Appeals

NO. 2000-CA-001331-MR

CURTIS ELDRIDGE, AS ADMINISTRATOR
OF THE ESTATE OF SANDRA L. ELDRIDGE;
AND BARBARA JEAN ELDRIDGE, AS NEXT
FRIEND AND LIMITED GUARDIAN OF
APRIL DANIELLE SMITH, AN INFANT — APPELLANTS

v.

APPEAL FROM KENTON CIRCUIT COURT
HONORABLE DOUGLAS M. STEPHENS, JUDGE
ACTION NO. 98-CI-01120

GEORGE E. MILLER, M.D. — APPELLEE

OPINION
REVERSING AND REMANDING
** ** ** ** **

BEFORE: GUDGEL, CHIEF JUDGE, EMBERTON, AND SCHRODER, JUDGES.

SCHRODER, JUDGE: This is an appeal from a judgment in favor of Dr. George A. Miller in a medical malpractice case. Having determined that the trial court erred in admitting the testimony of an expert witness, we reverse and remand for a new trial.

In 1990, Sandy Eldridge's left iliac artery was injured during disc surgery performed by another physician. Dr. Miller was called in to repair the injury with a graft, after which Sandy did not have any further significant problems with the artery until 1997. On May 12, 1997, Sandy returned to Dr.

Miller, who evaluated her symptoms and advised her that he believed her left iliac artery had occluded, and that she would require a diagnostic angiography with possible angioplasty and stent. Dr. Miller further advised her that if stent placement was not feasible, a bypass might be necessary.

On June 4, 1997, Dr. Miller performed the diagnostic angiography. In performing this procedure, Dr. Miller passed a guidewire through Sandy's left femoral artery and through the occluded segment of the left iliac artery. A angiographic catheter was then passed over, and exchanged for, the guidewire. Dr. Miller then performed the diagnostic angiogram by hand injecting dye through the catheter three times. After the angiography was completed, Dr. Miller performed a right iliac to left femoral bypass procedure, which was completed at approximately 4:30 p.m. At approximately 8:00 p.m., the nurses noted that Sandy was unresponsive. An MRI revealed a large pontine infarction (death of tissue in the brain) with occlusion of the basilar artery. In light of a hopeless prognosis, the decision was made to discontinue life support and Sandy passed away on June 6, 1997.

On June 10, 1998, appellants filed a medical malpractice action against Dr. Miller and others. The opinion of appellant's expert, Dr. Clay Skinner, a vascular surgeon, was that the occlusion in Sandy’s basilar artery was caused by Dr. Miller's negligence in performing the angiography. Specifically, Dr. Skinner opined that Dr. Miller's punching through the clot in Sandy's left iliac artery with the guidewire caused the clot to

break up. Dr. Skinner further opined that when Dr. Miller passed the catheter through the clot, the hollow catheter tip filled up with matter from the clot, and when Dr. Miller forcefully injected the contrast material through the catheter, a shower of emboli was propelled retrograde in Sandy's bloodstream. The emboli then traveled from the distal aorta to her left subclavian artery, a distance of about ten inches, after which emboli traveled to her basilar artery, causing the occlusion in her brain which resulted in her death.

Among the expert witnesses retained by Dr. Miller to rebut the testimony of Dr. Skinner was Bruce Taylor, Ph.D. Taylor is not a physician, but a biomedical engineer who specializes in the field of blood flow. Taylor developed computer models based on principles of physics to predict mathematically the distance emboli could have traveled retrograde in Sandy's bloodstream under the circumstances of the angiography. Taylor then constructed physical models (referred to as the "benchtop models") to validate the computer models, and which he planned to use to demonstrate his theories to the jury. The benchtop models consisted of various setups of plastic tubing and water. Based on his computer models, Taylor calculated that under the circumstances of the angiogram, emboli could not have traveled against the blood flow more than one or two centimeters, with approximately two inches as an absolute maximum. Thus, Taylor concluded that Dr. Skinner's theory that emboli traveled approximately ten to twelve inches from the aortic bifurcation to the subclavian artery, was impossible.

After receiving Taylor's report, on September 1, 1999, appellants filed a motion in limine to preclude Taylor from testifying unless a hearing pursuant to Daubert v. Merrell Dow Pharmaceuticals, Inc., 509 U.S. 579, 113 S. Ct. 2786, 125 L. Ed. 2d 469 (1993) was first held. The court ruled that appellants were to proceed with taking Taylor's deposition and elicit all testimony necessary for a Daubert hearing at that time. Taylor was deposed on January 27, 2000. On February 24, 2000, appellants moved the court to preclude Taylor from testifying, on grounds that his proffered testimony could not properly be applied to the facts at issue in the case. A Daubert hearing was held on March 8, 2000, and, in an order entered March 23, 2000, the court ruled that Taylor could testify, but would not be permitted to present his benchtop models to the jury. A jury trial commenced on March 22, 2000, with the jury finding in favor of Dr. Miller. The court entered its order and judgment on April 24, 2000 in accordance with the jury's verdict. This appeal followed.

On appeal, appellants argue that the trial court erred in permitting Taylor to testify as an expert witness for Dr. Miller, as his testimony did not meet the admissibility requirements of Daubert. Appellants contend that Taylor's testimony did not meet the "fit" requirement of Daubert, as his abstract and theoretical methodology could not be applied to the complex circumstances of Sandy Eldridge's operation. Further, appellants contend that Taylor's testimony was unreliable, as his

conclusions were based on the simple benchtop experiments which were excluded as unreliable by the trial court.

KRE 702 states:

> If scientific, technical, or other specialized knowledge will assist the trier of fact to understand the evidence or to determine a fact in issue, a witness qualified as an expert by knowledge, skill, experience, training, or education, may testify thereto in the form of an opinion or otherwise.

In Mitchell v. Commonwealth, Ky., 908 S.W.2d 100 (1995), overruled on other grounds, Fugate v. Commonwealth, Ky., 993 S.W.2d 931 (1999), the Kentucky Supreme Court adopted the standard of review set forth in Daubert v. Merrell Dow Pharmaceuticals, Inc., 509 U.S. 579, 113 S. Ct. 2786, 125 L. Ed. 2d 469 (1993) regarding the admissibility of expert scientific testimony. The Court held that "[w]hen '[f]aced with a proffer of expert, scientific testimony,' the trial judge must determine at [a preliminary hearing] 'whether the expert is proposing to testify to (1) scientific knowledge that (2) will assist the trier of fact to understand or determine a fact in issue.'" Mitchell, 908 S.W.2d at 101, quoting Daubert, 509 U.S. at 592, 113 S. Ct. at 2796. In order to meet the above standard, such expert testimony must be both relevant and reliable. Goodyear Tire and Rubber Co. v. Thompson, Ky., 11 S.W.3d 575, 578 (2000).

"The consideration of relevance has been described as one of 'fit'", which depends on whether the reasoning or methodology will assist the trier of fact. Id.; Daubert, 509 U.S. at 591, 113 S. Ct. at 2796. "The consideration of reliability entails an assessment into the validity of the

reasoning and the methodology upon which the expert testimony is based." Goodyear, 11 S.W.3d at 578.

Factors to be considered by the trial court in determining reliability include (1) whether the theory or technique can be tested and has been tested; (2) whether the theory or technique has been subjected to peer review and publication; (3) whether, with respect to a particular technique, there is a high known or potential rate of error; and (4) whether the theory or technique has general acceptance in the relevant community. Id. at 578-579, citing Daubert, 509 U.S. at 592-594, 113 S. Ct. at 2796-97; Mitchell, 908 S.W.2d at 102. In Goodyear Tire and Rubber Company v. Thompson, Ky., 11 S.W.3d 575 (2000), the Kentucky Supreme Court, adopting the reasoning of the United States Supreme Court in Kumho Tire Company v. Carmichael, 526 U.S. 137, 119 S. Ct. 1167, 143 L. Ed. 2d 238 (1999), held that Daubert and Mitchell apply not only to testimony based on "scientific" knowledge, but also to testimony based on "technical" and "other specialized knowledge" as well, and hence the trial judge may consider the Daubert factors in performing its "gatekeeping" role in screening expert testimony based on "technical" or "other specialized knowledge."

Taylor's report indicates that his conclusions as to specifically how far emboli could have traveled retrograde are based on the results of his computer models and benchtop experiments. The trial court excluded the benchtop models, but made no express findings in its order. The record does not contain the Daubert hearing nor Taylor's January 27, 1999

deposition testimony, but does include Taylor's report and trial testimony. With regard to the "fit" requirement of Daubert, Taylor's report indicates that his methodology did not take into account the complexities of the human circulatory system, nor account for circumstances which occurred or may have occurred during Sandy Eldridge's surgery. With regard to reliability, we believe Taylor's methodology fails to satisfy any of the four Daubert factors. Taylor's methodology, as applied to calculating retrograde emboli travel distance in the circulatory system, has never been tested in a human being. Taylor was not aware of any studies or literature discussing the possibility or impossibility of retrograde embolization, and had not previously performed such a study himself, hence there has been no opportunity for peer review of his methodology. The third factor is difficult to apply, as Taylor's methods are not an accepted "technique" (the record indicates no such technique exists) for calculating maximum retrograde travel of an embolus in the circulatory system. Although we do not dispute Taylor's concepts in the abstract, it is clear that significant potential for error exists in Taylor's methodology as applied to the facts of this case. For example, Taylor's computations required him to make assumptions and approximations for unknown values including size, composition, and initial velocity of the embolus, Sandy's blood velocity, and velocity of contrast dye leaving the catheter. We acknowledge that Taylor did attempt to model situations which would allow for maximum migration of a particle. However, it is unclear, particularly in light of the fact that his methodology

is untested, what cumulative effect the use of assumed and estimated values, combined with disregard of the complexities of the human circulatory system and conditions specific to Sandy and the procedures performed upon her, would have on the accuracy of Taylor's mathematical and experimental predictions. With regard to the fourth factor, from his trial testimony it appears no such technique or studies exist for calculating retrograde emboli travel distance, and hence there is no "general acceptance" in the community.

A trial court's ruling on the admission of expert testimony is reviewed under an abuse of discretion standard. Goodyear, 11 S.W.3d at 577-578. Having concluded that Taylor's methodology in its entirety failed to satisfy either the fit or reliability requirements of Daubert, we believe the trial court abused its discretion in admitting Taylor's testimony. We must next determine whether such error was harmful. CR 61.01.

In his trial testimony (presented by way of videotape deposition), Taylor repeatedly asserted that, based on the physical principles of blood flow, Dr. Skinner's theory that emboli traveled ten inches against the blood flow was impossible and preposterous. Taylor opined that under the circumstances, the maximum distance a particle shot out of the catheter could travel retrograde, or be propelled retrograde by the injection of the contrast media, in the blood stream would be approximately one or two centimeters, and about two inches at the absolute maximum. Taylor offered no explanation of where these figures came from. However, our review of the record indicates these

figures came from Taylor's report utilizing the methodology we concluded inadmissible per Daubert. As a central issue in this case was whether emboli could travel the approximately ten-inch distance from the aortic bifurcation to the aortic arch (from where they could have traveled to the subclavian artery and subsequently lodged in the basilar artery), we cannot say that the admission of Taylor's testimony was harmless error.

For the aforementioned reasons, the judgment of the Kenton Circuit Court is reversed and the case remanded for a new trial.

ALL CONCUR.

BRIEF FOR APPELLANTS:

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