IN THE COURT OF APPEALS OF THE STATE OF MISSISSIPPI

NO. 2009-CA-01037

ATRAVIUS COLEMAN BY AND THROUGH HIS MOTHER AND NEXT FRIEND, ANGELIA PATTERSON ON BEHALF OF THE WRONGFUL DEATH BENEFICIARIES AND AS ADMINISTRATRIX OF THE ESTATE OF ATRAVIUS COLEMAN, DECEASED — **PLAINTIFFS/APPELLANTS**

VS.

BOB TIBBS, M.D. AND WILLIAM McARTHUR, M.D. — **APPELLEES/DEFENDANTS**

AND

ATRAVIUS COLEMAN BY AND THROUGH HIS MOTHER AND NEXT FRIEND, ANGELIA PATTERSON ON BEHALF OF THE WRONGFUL DEATH BENEFICIARIES AND AS ADMINISTRATRIX OF THE ESTATE OF ATRAVIUS COLEMAN, DECEASED — **PLAINTIFFS/APPELLANTS**

VS.

BOLIVAR MEDICAL CENTER — **APPELLEES/DEFENDANTS**

APPEAL FROM THE CIRCUIT COURT
OF BOLIVAR COUNTY, MISSISSIPPI

CIVIL ACTION NOS. 2002-150 and 2002-151

REPLY BRIEF OF APPELLANTS

OF COUNSEL:
GEORGE F. HOLLOWELL, JR.
Mississippi Bar No. [redacted]
Post Office Drawer 1407
Greenville, Mississippi 38702-1407
(662) 378-3103
(662) 378-3420(fax)
ATTORNEY FOR APPELLANT

ORAL ARGUMENT REQUESTED

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I. The Focus of the Review of the Trial Court's Ruling for Abuse of Discretion Is on the Trial Court's Reasoning and Whether It Is Based on or Embodies an Error of Law

The Circuit Court's opinion makes it clear that Dr. Shukan's and Dr. Hayne's causation testimony was excluded for only one reason. The trial Court believed it was impossible to determine pre-death levels of Demerol (Meperidine) in a neonate by the process of back extrapolation with the degree of scientific certainty required by *Daubert v. Merrell Dow Pharms., Inc.*, 509 U.S. 579, 113 S. Ct. 2786, 125 L. Ed. 2d 469 (1993)

> due to the limited scientific studies gauging the half-life of Meperidine in the body of a *neonate* ... and the scientific and/or medical literature offered describing ... [such wide] ranges of half lives of Meperidine and norMeperidine in a *neonate* ... .

(R. 1219). The Circuit Court made it very clear it did not question the scientific fact that drugs, including Meperidine, are eliminated from the human body according to the principle of half lives. It also made it clear it did not question the validity and acceptance of the methodology of back extrapolation to calculate an amount of a drug in a body at an earlier point in time based on a measurement of the amount of the drug in the body at a later point in time using the principles behind the half lives of drugs. The Circuit Court was clear that these parts of the principles and methodology Dr. Shukan and Dr. Hayne based their opinions on passed muster under *Daubert*.

> To be clear, the Court does not question the process of back extrapolation. Rather, the Court's reservations in this case grow from what the Court finds to be a lack of scientific agreement and/or specificity as concerns the half life of Meperidine in a neonate.

(R. 1218). The only point where the Circuit Court held that their opinions did not pass muster under *Daubert* was on the half life for Meperidine in a neonate, and the only reason that part did not pass the *Daubert* hurdle according to the Circuit Court was because there were not sufficient studies specifically on the half life of this particular drug specifically in neonates to establish scientific agreement on a specific half life for this particular drug in a newborn. (R. 1218-1219)

Thus, the evidentiary question before this Court is whether the *Daubert* standard requires a sufficient number of large studies to produce scientific agreement on the precise half life for

metabolism of Meperidine specifically in neonates before pediatricians or forensic pathologists can an express an opinion that the death of a newborn infant was caused by a failure to respond appropriately to metabolic acidosis resulting from a toxic level of Meperidine based on the levels of Meperidine and its metabolite found in the body at an autopsy in combination with the course of progress of symptoms and various lab tests documented in the medical records. The three Appellee Briefs repeatedly attempt to draw the Court's attention away from this focus. Instead, they attempt to persuade this Court that they challenged the reliability of Plaintiff's expert's opinions and in response Plaintiff's experts provided no evidence of the reliability of their methodology and opinions because Plaintiff's response was not presented through testimony of Dr. Shukan and Dr. Hayne presenting peer reviewed literature which they relied upon for the half life figures they used. Later in this Reply Brief, Plaintiffs will demonstrate they responded with appropriate means of demonstrating scientific evidence supporting the reliability of their expert's methods and opinions. However, it is crucial to bring the focus back to the Appellate Case Law on the *Daubert* standard for expert causation evidence in medical or toxic substance exposure cases first. That case law demonstrates the flaw in the Circuit Court's reasoning and the flaws in the arguments in all three Appellee Briefs.

II. Daubert Does Not Require a Sufficient Number of Published Studies on the Exact Drug in the Exact Same Patient Population as the Case Before the Court to Produce Scientific Agreement on the Precise Values and Data to be Used in Applying a Known Methodology to Forming Opinions Concerning the Situation Before the Court

The Circuit Court in this case set the *Daubert* bar too high. It required greater certainty and more specificity than the law requires. Scientific agreement is not required. Scientific specificity or scientific precision is not required either. *Ruiz-Troche v. Pepsi Cola of P.R. Bottling Co.*, 161 F.3d 77, 83-86 (1st Cir. 1998); *Heller v. Shaw Indus., Inc.*, 167 F.3d 146, 155 (3d Cir. 1999); *Knight v. Kirby Inland Marine, Inc.*, 482 F.3d 347, 351(5th Cir. 2007); *Bonner v. ISP Technologies, Inc*, 259 F.3d 924, 929 (8th Cir. 2001); *National Bank of Commerce v. Associated Milk Prods. Inc.*, 191 F.3d 858, 862 (8th Cir. 1999); *Poole v. Avara*, 908 So. 2d 716,

724 (Miss. 2005); *Teston v. State,* No. 2007-KA-00353-COA, 2008 Miss. App. LEXIS 681, ¶¶ 35-42 (Nov. 18, 2008).

Ruiz-Troche held a District Court abused its discretion in excluding an expert's testimony concerning the approximate time and amount of Cocaine ingested based on back extrapolation using half lives because the published studies showed the half life of Cocaine varied significantly between individuals. The District Court and the party opposing the evidence took the position that because the half-life varies a great deal from individual to individual, it could not be used to determine initial dosage ingested with any accuracy and therefore expert testimony based on back extrapolation was too unreliable to be admitted under *Daubert*. The First Circuit rejected that reasoning as setting the bar higher than required by *Daubert*, saying:

> We think that the plaintiffs (and the District Court) set the bar too high. Although the statements that they assemble cast doubt on Dr. O'Donnell's position -- for example, those statements suggest that the half-life technique for calculating dosage has an uncertain rate of error -- no single factor disposes of a reliability inquiry. See *Daubert,* 509 U.S. at 592-95. Dr. O'Donnell's technique has been subjected to, and survived, the rigors of testing, publication, and peer review, and it appears to have won significant (if not universal) acceptance within the scientific community. *Daubert* does not require that a party who proffers expert testimony carry the burden of proving to the judge that the expert's assessment of the situation is correct. As long as an expert's scientific testimony rests upon "good grounds, based on what is known," *Daubert*, 509 U.S. at 590 (internal quotation marks omitted), it should be tested by the adversary process -- competing expert testimony and active cross-examination -- rather than excluded from jurors' scrutiny for fear that they will not grasp its complexities or satisfactorily weigh its inadequacies, see id. at 596. In short, *Daubert* neither requires nor empowers trial Courts to determine which of several competing scientific theories has the best provenance. It demands only that the proponent of the evidence show that the expert's conclusion has been arrived at in a scientifically sound and methodologically reliable fashion. See *Kannankeril v. Terminix Int'l, Inc.*, 128 F.3d 802, 806 (3d Cir. 1997); *In re Paoli R.R. Yard PCB Litig.*, 35 F.3d 717, 744 (3d Cir. 1994).
>
> On balance, we find that Dr. O'Donnell's dosage opinion, incorporating a range of time in which he believed Ruiz took the Cocaine, satisfies this standard. The opinion was premised on an accepted technique, embodied a methodology that has significant support in the relevant universe of scientific literature, and was expressed to a reasonable degree of pharmacological certainty. While the literature does not irrefutably prove the accuracy of Dr. O'Donnell's dosage conclusions, it furnishes a sufficient underpinning for those conclusions to forfend preclusion of his testimony as unreliable. Thus, the District Court's refusal to entertain Dr. O'Donnell's dosage opinion constituted an abuse of discretion. ...
>
> To compound this error, the Court applied a standard of scientific certainty to the impairment testimony beyond that which *Daubert* envisions. The Court

> imposed a threshold requirement that science be able to declare that a precise quantity of Cocaine in the bloodstream produces an equally precise degree of impairment. This requirement solicits a level of assurance that science realistically cannot achieve and that Daubert does not demand. See *Daubert*, 509 U.S. at 590 (commenting that "arguably, there are no certainties in science"). The adoption of such a standard impermissibly changes the Trial Judge's role under *Daubert* from that of gatekeeper to that of armed guard. That mistaken application of the law likewise constitutes an abuse of discretion.

Id.

Both Mississippi's Appellate Courts and the Federal Courts have repeatedly held that the *Daubert* standard does not require the proponent of expert testimony to demonstrate scientific agreement in order for the testimony to be admissible. They have also repeatedly held that *Daubert* does not require our Courts to exclude expert evidence in areas of science which have not been studied extensively enough to produce scientific certainty or agreement, or even any scientific publications, on the precise point at issue in our Courts. See e.g., *Poole*, 908 So. 2d at 724; *Teston* at ¶¶ 35-42 (finding testimony on back extrapolation of Hydrocodone satisfied *Daubert* despite lack of studies on the subject and extremely small size of study (only 5 men) used for dose relation to peak levels of Hydrocodone in blood); *Watts v. Radiator Specialty Co.*, 990 So. 2d 143, ¶ 18 (Miss. 2008); *Knight,* 482 F.3d at 351 ("[I]n epidemiology hardly any study is ever conclusive, and we do not suggest that an expert must back his or her opinion with published studies that unequivocally support his or her conclusions.") (citations omitted); *Bonner,* 259 F.3d at 929 (8th Cir. 2001) ("[T]here is no requirement that published epidemiological studies supporting an expert's opinion exist in order for the opinion to be admissible."); *Heller*, 167 F.3d at 155 (same); see also *National Bank of Commerce*, 191 F.3d at 862 (8th Cir. 1999) citing *Daubert*, 509 U.S. at 593-594.

To the contrary, requiring sufficient scientific studies on the precise point at issue in a case to produce scientific agreement on that point would effectively result in reinstatement of the *Frye* test rejected by *Daubert.*

> Given the liberal thrust of the Federal Rules of Evidence, the flexible nature of the Daubert inquiry, and the proper roles of the judge and the jury in evaluating the ultimate credibility of an expert's opinion, 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. *Cf. McCullock v. H.B. Fuller Co.*, 61 F.3d 1038, 1043 (2d Cir. 1995) (affirming admission of treating doctor's testimony despite the fact that he "could not point to a single piece of medical literature that says glue fumes cause throat polyps"). To so hold would doom from the outset all cases in which the state of research on the specific ailment or on the alleged causal agent was in its early stages, and would effectively resurrect a *Frye*-like bright-line standard, not by requiring that a methodology be "generally accepted," but by excluding expert testimony not backed by published (and presumably peer-reviewed) studies.

Heller, 167 F.3d at 155.

The Mississippi Supreme Court has similarly held that a lack of published studies on the effect of a specific substance on humans providing precise data from which a precise level at which the substance is toxic to humans can be calculated does not render causation testimony by experts so unreliable as to be inadmissible under the *Daubert* standard. In *Franklin Corp. v. Tedford*, 18 So. 3d 215 (Miss. 2009), the defense questioned the reliability of the testimony of Plaintiffs' experts that the Plaintiffs' injuries were caused by exposure to 1-BP based on a lack of peer reviewed literature establishing the levels at which 1-BP becomes harmful to humans. The experts also admitted that they did not know the precise amount of 1-BP to which the Plaintiffs were exposed. The available scientific literature consisted of one or two case reports about an individual's exposure to 1-BP and several studies involving problems in rats exposed to 1-BP. One expert testified that few studies have been done on the effect of 1-BP on humans. Based upon her own cases, she testified "[w]e know that my patients had neurologic damage at . . . [108 ppm]. . . . We don't know how long it takes, . . . how many weeks, months, days, hours of exposure it takes." Another expert, whom both sides accepted as the leading expert on 1-BP toxicity testified that "we . . . believe if exposure level is higher than some levels, . . . such overexposure to [1-BP] can cause neurological damage in humans even [if] we don't know the . . . very precise relationship of the dose response." *Tedford* at ¶¶ 37-46.

The Mississippi Supreme Court held the experts' opinions were admissible because the opinions were based upon reliable methodologies even though the field was a relatively new one with limited reliable methodology.

> [A]s Dr. Majersik noted, determining the exact lower level of 1-BP exposure which causes neurologic injury in humans is challenging, given appropriate, ethical constraints. At best, nondefinitive determinations have been rendered via relevant case reports, MSDSs, and organizational recommendations. This Court finds such sources to be sufficient. "[I]t would be unreasonable to conclude that the subject of scientific testimony must be 'known' to a certainty." *Daubert*, 509 U.S. at 590. ... Similarly, this Court finds that the absence of data on the exact exposure level at which humans suffer neurologic injury ought not preclude the Plaintiffs' experts from testifying. ... The collective case reports, MSDS', and organizational recommendations, paired with the direct and circumstantial evidence in the case *sub judice*, support a causal connection between the Plaintiffs' exposure to 1-BP and their injuries.

Tedford at ¶ 45. Similarly, the lack of data on the precise half life of Meperidine in neonates or the wide range of reported half lives for Meperidine in infants ought not to preclude Dr. Shukan's and Dr. Hayne's causation testimony. The available scientific information on the pharmacological properties of Meperidine, coupled with the documented used of Demerol during labor; the discrepancies between the records on the amount of Demerol taken from the pharmacy, the amount used during labor, and the amount wasted leaving 100 mg of Demerol unaccounted for; the amounts of Meperidine and Normeperidine found in Atravius Coleman's body at autopsy; the timing and severity of the symptoms documented for Atravius Coleman up to his death; the test results and vital sign readings documented prior to Atravius Coleman's death; and the delays in utilizing standard treatments for acidosis support a causal connection between Atravius Coleman's death and the failure to treat or the delay in treating acidosis caused by exposure to Meperidine and a finding that Dr. Hayne's and Dr. Shukan's opinions are sufficiently reliable to satisfy the *Daubert* standard.

The Trial Court here made the same error of law the Trial Court made in *Ruiz-Troche*, setting the bar of admissibility far higher than required by *Daubert/McLemore* or the Rules of Evidence. By requiring scientific agreement on the precise half-life of Meperidine in neonates as a prerequisite to admissibility of Dr. Shukan's and Dr. Hayne's causation opinions, the Trial Court effectively reinstated the *Frye* general acceptance standard of admissibility which has been overruled and rejected by *Daubert*, *McLemore*, and the latest versions of Rules 702 and 703.

III. Rules 702 and 703 and *Daubert/McLemore* Allow Experts to Base Their Opinions on Data Drawn From Sources Other Than Studies Reported in Peer Reviewed Literature

and

IV. When the Reliability of Particular Expert Testimony Is Challenged, the Challenged Party is Not Restricted to Meeting the Challenge with Peer Reviewed Literature Presented Through the Challenged Expert's Own Testimony. The Full Range of Indicia of Reliability Contemplated by Rules 702 and 703 and Daubert/ McLemore is Available to Meet a Reliability Challenge.

All three Appellee Briefs take the position that Dr. Shukan's and Dr. Hayne's opinions and testimony are too unreliable to pass the *Daubert* standard for admissibility because neither Dr. Shukan nor Dr. Hayne cited any published peer reviewed studies on Meperidine in neonates as the source of the data on Meperidine which was used with the methodology of back extrapolation as part of their process of forming their opinions on the role of Meperidine in causing Atravius Coleman's death. Neither the Mississippi or Federal Rules of Evidence or the *Daubert/ McLemore* case law requires the facts or data an expect bases his opinions on to be obtained from or supported by a consensus of the peer reviewed literature in the field. Rule 703 states:

> The facts or data in the particular case upon which an expert bases an opinion or inference may be those perceived by or made known to him at or before the hearing. If of a type reasonably relied upon by experts in the particular field in forming opinions or inferences upon the subject, the facts or data need not be admissible in evidence.

The official comments to M.R.E. 703 states in part:

> There are three possible sources which may produce an expert's facts or data. ... The new practice under Rule 703 brings a third source: the presentation of data to the expert outside of Court and other than by his personal observation. The Advisory Committee's Note to F.R.E. 703 presents a persuasive rationale for the use of the third source. A physician, for example, bases his medical diagnosis of his patient on many sources. ... Since these sources provide the doctor with information that he utilizes in making life-and-death decisions, his validation of them ought to be sufficient for trial, especially since he can be cross-examined.

The official comments to F.R.E. 703 states in part:

> Thus a physician in his own practice bases his diagnosis on information from numerous sources and of considerable variety, including statements by patients and relatives, reports and opinions from nurses, technicians and other doctors,

> hospital records, and X rays. ... The physician makes life-and-death decisions in reliance upon them. His validation, expertly performed and subject to cross-examination, ought to suffice for judicial purposes.

See also *Miller v. State*, 919 So. 2d 1137, ¶¶ 17-23 (Miss. App. 2005); *Jones v. State*, 776 So. 2d 643, ¶¶ 22-23 (Miss. 2000).

Thus contrary to Appellee's arguments, Dr. Shukan and Dr. Hayne were clearly not restricted to consulting peer reviewed literature when determining what data on Meperidine to use in applying the method of back extrapolation to determine that the levels of Meperidine in Atravius Coleman's blood when he began having difficulties prior to his death were higher than the therapeutic levels found during the autopsy. All that was required to be demonstrated was that the data used in forming their opinions was "of a type reasonably relied upon by experts in the particular field in forming opinions or inferences upon the subject." M.R.E. 703

Dr. Hayne obtained the data on Meperidine used in forming his opinions by consulting toxicology experts at the Mississippi State Crime lab. Obtaining data by consultation with experts in specific fields is a reliable source specifically sanctioned by Rule 703 and its comments and also by the case law. *Jones* at ¶¶ 22-23 (specifically sanctioning Dr. Hayne's reliance on consultations with experts in other forensic specialities relying on Rule 703 and its comments); see also *United States v 1014.16 Acres of Land,* 558 F Supp 1238 (W.D. Mo. 1983), aff'd 739 F2d 1371, 1242 (8th Cir. 1984) (It is reasonable to expect that experts will rely on opinions of expert in other fields as background material for arriving at opinions.) Dr. Hayne and the experts he consulted specifically discussed the appropriate half life to be used with a neonate. Both the experts Dr. Hayne consulted and Dr. Hayne himself were aware of, and took into account the fact that the half life of Meperidine in a neonate would be longer than the half life in an average adult.[1]

---

[1]A ... So you have not only Meperidine but you have a breakdown product. If you use a half life of approximately five hours -- four and a half, five hours -- I think you took deposition from a member of state crime lab, Mr. Hales, and he indicated that would be the range that he would expect of Meperidine metabolism. So if you go back 21 hours with a half life of four and a half, five hours, you would see it could very easily be in the toxic range. Deaths have resulted from

Dr. Shukan gave three depositions, including a video deposition of his trial testimony. Despite having three opportunities, the Defendants did not question Dr. Shukan about the source of the half life data he used. Defendants' never asked Dr. Shukan any questions concerning the literature on the half life of Meperidine in neonates which they now rely upon to support their arguments that Dr. Shukan's opinions are unreliable. Defendants' failure to question Dr. Shukan in his three depositions on points, issues and published studies which they later argued were so critical to the reliability of his testimony substantially weakens this argument. *Univ. of Miss. Med. Ctr. v. Peacock*, 972 So. 2d 619, ¶¶ 20-22 (Miss. App. 2006).

Meperidine overdoses anywhere from one to eight micrograms per milliliter.
...
Q So is the half life of Meperidine different in a fetus or a newborn than it is in the mother that got the Demerol?
A It's longer in a child.
Q And that would be the two- to five-hour range?
A No. The crime lab gave a figure for this case, anywhere from two to five hours, but I think it would be on the longer side of the two to five hours, not the shorter side. ...
A I talked to Sam Howell, director of the crime lab, and I also talked the toxicologist ... Shan Hales. ...I talked to him about this, about metabolism of Meperidine, the period of some 20, 21 hours of survival of this child, and what his thoughts were as to a level of .17, also .12 NorMeperidine in that time frame. ...
Q Why were you discussing the metabolism rate of Demerol and such with Mr. Howell?
A I think there is some issue in the literature of what rate it actually metabolizes, you know. He's always stated that it takes longer to metabolize in an infant than it does in an adult, and you can get quite a spectrum, you know, of half lifes of different drugs including Demerol in infants verses adults. And he is a -- he's the director of the crime lab, but he's also a toxicologist too. ... The metabolism rate, he thought it would be higher than two, two and a half, three hours. He thought it would be closer to four, four and a half, five hours, and he agreed with Shan Hales that it would be in that range of four or five hours, three and a half hours, as opposed to two hours or two and a half hours. ...After I talked to Sam Howell, he said why don't you talk to the toxicologist, so I talked to [Shan Hales].
Q I'm trying to understand what the purpose of that conversation was. Why did you want to talk to him?
A Again, it was half life of Demerol in adult verses child verses neonate.
Q And he expressed the opinion that the half life was longer in an infant?
A Yes.
Q And he thought that the literature showed about four and a half to five hours to metabolize?
A Yes, in that time frame, and there's literature I've read that would concur with that.
Q Do you think that that's a reasonable --
A I think it's --
Q -- interpretation?
A -- in the literature, and, yes, and it's also basically concurred by the two experts at the crime lab.
(D4 at 118-119, 126-127, 156-158)

In *Peacock*, as in this case, the party later objecting to the expert's testimony as unreliable failed to question the expert on direct or cross examination on the points and issues which it later claimed rendered his testimony unreliable. The Court rejected these arguments saying:

> UMC contends [Dr. Sykes'] opinions are not reliable because "Dr. Sykes ignores the necessary element of cardiovascular dysfunction in his diagnosis of abdominal compartment syndrome;" no foundation of reliable data or methodology was established to support Dr. Sykes's opinion; and Dr. Sykes's opinion is not based on the facts. ...
>
> First, Dr. Claude Minor, a defense expert, testified that cardiovascular dysfunction was a necessary element for a diagnosis of abdominal compartment syndrome. UMC notes that Dr. Minor's testimony was supported by a recent study sponsored by the Vanderbilt School of Medicine, whereas Dr. Sykes did not cite to a scientific journal in making his diagnosis. UMC also claims that while Dr. Sykes twice admitted that cardiovascular dysfunction is necessary for a finding of abdominal compartment syndrome, he ignored the element in his opinion, thereby rendering it unreliable.
>
> We cannot agree with UMC's assertions. Dr. Sykes was not questioned regarding UMC's contention that a finding of cardiovascular dysfunction was necessary for a diagnosis of abdominal compartment syndrome. Furthermore, counsel for UMC failed to cross-examine Dr. Sykes with the Vanderbilt study which it claims nullifies his testimony. In fact, the expert testimony of Dr. Minor, which UMC now deems critical, was not even brought out on his direct examination, but as more of an afterthought on cross examination. ...
>
> Second, UMC contends that no foundation of reliable data or methodology was established to support Dr. Sykes's opinion as he "did not rely on or even cite any scientific journals or studies supporting the parameters he considered in making the diagnosis [and] never stated that he had any personal experience in treating patients with abdominal compartment syndrome." As previously noted, the *Daubert* reliability inquiry is " flexible," with the Trial Court having "'considerable leeway in deciding in a particular case how to go about determining whether particular expert testimony is reliable.'" *McLemore,* 863 So.2d at 37 (P13) (quoting *Daubert*, 509 U.S. at 594; *Kumho Tire*, 526 U.S. at 152, respectively). If citation to a medical journal or express statement of personal experience in treating patients with abdominal compartment syndrome was a prerequisite to testifying, both Dr. Sykes's and Dr. Borman's opinions would have to be excluded. Upon Dr. Sykes testifying to his treatment of patients with grade four liver lacerations, UMC decided not to challenge his qualifications to testify, stating that it would "use the rest of [its] questions in cross." Neither party saw fit to question Dr. Sykes regarding his experience regarding treatment of patients with abdominal compartment syndrome. While UMC correctly notes that Dr. Sykes " never stated" he had any personal experience in treating patients with abdominal compartment syndrome, we cannot presume at this late date that he did not. If experience with abdominal compartment syndrome, as distinguished from experience with grade four liver lacerations, was so vital to Dr. Sykes's reliability, vel non, we find that it was incumbent on UMC to bring out that lack of experience on the record.

Id at 626-628. For the same reasons these arguments were rejected in *Peacock*, Defendants'

arguments that Dr. Shukan's and Dr. Hayne's causation opinions are unreliable because they failed to produce peer reviewed literature directly supporting the applicability of the half lives they used in forming their opinions to neonates should be rejected in this case.

All three Appellee Briefs also focus on the fact that neither Dr. Shukan nor Dr. Hayne testified at the *Daubert* hearing, falsely implying that because they did not testify at that hearing, nothing was produced in response to the attack on the reliability of their opinions based on the attack on the reliability of the half life used. Dr. Hayne was available to testify at the beginning of the hearing, but had to leave because of illness. Dr. Shukan appeared for three depositions prior to Defendants' filing their motion. His trial testimony had already been previously recorded three times before the motion was filed. At the time the hearing was scheduled, Dr. Shukan was not available on short notice to be present at the hearing. Nothing about their failure to testify supports an inference that they could not produce evidence showing the general acceptance or reliability of their opinions.

To the contrary, Plaintiffs' produced a toxicology expert, Dr. Christopher Long, to testify in regard to the criticisms raised by Defendants' new expert. Dr. Long examined all the literature Defendants' experts relied upon, analyzed the underlying data on individual subjects in the studies, eliminated subjects whose condition was not substantially similar to Atravius Coleman, and demonstrated that when these inapplicable "outlier" study subjects, mostly at the higher end of the half life ranges, were eliminated, the half lives used by Dr. Shukan and Dr. Hayne fell within the range of half lives documented for healthy neonates in the studies. T. 47-49, 101 Delving into the particular study subjects and reanalyzing the data on the portion of the subjects most closely akin to the situation before the Court is a time honored and accepted scientific methodology which has been held to satisfy *Daubert's* reliability requirements. See e.g., *In re Pfizer Inc. Sec. Litig.*, 2010 U.S. Dist. LEXIS 26927, 82 Fed. R. Evid. Serv. 134, (S.D.N.Y. March 22, 2010); *Smith v. Pfizer Inc.*, 2010 U.S. Dist. LEXIS 47698 (M.D. Tenn. May 14, 2010)

Dr. Long also testified that he considered the presence of the metabolite Normeperidine

in Atravius Coleman's Post-Mortem Toxicology Report as demonstrating both the prior presence of a higher level of Demerol and the fact that Atravius Coleman's liver was working and metabolizing the drug, indicating it was appropriate to place him in the category of infants for whom the studies reported the shortest half lives. T. 56-67

Given the range of short half lives for Demerol in healthy infants, this child's post mortem levels are consistent with a dose given directly much closer to death and are not consistent with the Demerol coming solely from the mother. The first signs of Demerol toxicity in this child's records are after the circumcision. The facts of this case support the conclusion the child was given Demerol around the time of the circumcision. What was found and not found in the autopsy further supports that conclusion. T. 51-53. This child got some Demerol through the mother at delivery, but not enough to be toxic at that point. He got more later. Given the timing of his symptoms around 3:30, he likely got the additional Demerol a couple of hours earlier around the time of the circumcision. At that point, what he was given then added to the effects of what he got from his mother earlier and together it rose to toxic levels causing his death. T. 121.

Dr. Long also provided testimony demonstrating that the sources of information used by Dr. Shukan and Dr. Hayne for the data on Demerol used in forming their opinions was of the type routinely relied upon by experts in forming opinions in the daily performance of their work outside of litigation. The use of this additional expert added support to reliability of Dr. Shukan's and Dr. Hayne's methods and opinions by demonstrating that other experts in the field would be in agreement with their methods and their opinions and that the differences of opinion in this case go to credibility rather than reliability. T. 50.

V. Plaintiff's Responded to the Reliability Challenges With Evidence Meeting and Exceeding the *Hill* Requirement of "Some Evidence" of Reliability

Hill v. Mills, 26 So.2d 322, ¶¶ 29-41 (Miss. 2010) requires the party offering the challenged expert's opinion to "present the trial judge with *some evidence* indicating that the offered opinion has *some degree* of acceptance and support within the scientific community."

Hill does not require the particular expert whose opinion is being challenged to appear and present the testimony demonstrating "some degree of acceptance and support within the scientific community." It also does not require the proffering party to provide evidence that the proffered expert's challenged opinion is supported by the greater weight of authority within the scientific community or that the challenged opinion has a better provenance within the scientific community than the other side's experts' opinions. What it requires is some evidence of some degree of support within the scientific community. Plaintiffs did provide the Trial Court with some evidence of some degree of support within the scientific community for the opinions of Dr. Shukan and Dr. Hayne.

VI. Daubert/McLemore Standard for Expert Testimony on Medical Causation Does Not Require Direct Evidence of Causation in the Medical Records

Defendants claim it is undisputed no Demerol was given to Atravius Coleman after his birth. The Court commented in a footnote to its opinion excluding Dr. Shukan's and Dr. Hayne's testimony that there is no evidence in the record to support the theory Demerol was given to Atravius Coleman after birth or in connection with the circumcision. However, both the Defendants and the Court ignore circumstantial evidence supporting an inference and expert opinion that Atravius Coleman had more Demerol in his system at death than can be explained solely by Demerol being administered to the mother in accordance with the standard of care during labor.

The Labor Progress Notes state two 50mg doses were given to Angelia at approximately 8:00 p.m. and 11:00 p.m. However, the Controlled Substances Log shows two 100 mg vials were dispensed and none was wasted. This discrepancy leaves unaccounted 100mg of Demerol, a controlled substance. There are also discrepancies in the evidence concerning the use of anesthetics during the circumcision procedure. Dr. McArthur claims he did not order any type of anesthesia or sedation for Atravius Coleman in connection with the circumcision operation and none was used, but the surgical notes for the procedure have conveniently disappeared. (D3 at 87-89, 107, 114-115; R. 868) The nurses notes covering that time period note the procedure was

performed but say nothing about pain relief. (D6 at BMC0016) One of the nurses claims a topical anesthetizing agent, but no Demerol, was used, but there is no documentation supporting her testimony either. (D3 at 116-117)

A hospital has a statutorily imposed duty to keep detailed records on all of its patients. *DeLaughter v. Lawrence Co. Hospital*, 601 So.2d 818, 821-823 (Miss. 1992) citing Miss. Code Ann. §§ 41-9-63 and 41-9-69. When a part of those records are lost, destroyed, misplaced, unavailable or the hospital cannot produce them when they are sought in discovery, a presumption is raised that the document would, if produced, militate against the party destroying or suppressing it. The hospital then has the burden to show it did not destroy or misplace the hospital record. If it cannot meet this burden, then the jury may draw an inference that the information in the missing record would be favorable to the Plaintiffs' case. *Id.* Neither the hospital nor Dr. Tibbs has produced any evidence that they were not responsible for the disappearance of the circumcision records. Thus, the presumption is in effect at least as against the hospital who has a statutory duty to make, keep and preserve such records. A jury could draw the inference from the missing circumcision records, the conflict between Dr. McArthur's and the nurse's testimony as to whether any anesthesia was used in the procedure, the failure of the hospital records to account for the missing 100mg of Demerol dispensed during labor and not wasted, as well as Dr. Shukan's testimony that the use of Demerol on infants for analgesia during circumcision procedures is common practice in many hospitals, that the missing records would show that Demerol was administered to Atravius Coleman in connection with the circumcision procedure and that the amount administered was higher than a therapeutic dose when combined with the amount of Demerol still in his system from the Demerol given to the mother during labor. See *DeLaughter v. Lawrence Co. Hospital*, 601 So.2d 818, 821-823 (Miss. 1992) citing Miss. Code Ann. §§ 41-9-63 and 41-9-69

All of the defense experts assume the Labor Progress Notes are correct and the Controlled Substances Log is in error on the amount wasted. Dr. Hayne assumed the Controlled Substances

Log was correct and the Labor Progress Notes reflect the doses ordered for Angelia Patterson instead of the doses actually given to her. He accepted the possibility that she had received two 100 mg doses. D4 at 118 to 125, 161-165. Dr. Shukan resolved the conflict by accepting both the Labor Progress Notes as to the size doses given to Angelia Patterson and the Controlled Substances Log as to amount wasted. This left 100 mg of Meperidine unaccounted for and available as a possible source of Meperidine toxicity for Atravius Coleman. He theorized that as some hospitals use Meperidine as an anesthetic for circumcisions and Atravius Coleman's condition began to deteriorate rapidly about an hour and a half after circumcision, Atravius Coleman suffered from Meperidine toxicity from the circumcision anesthesia. While Dr. McArthur and the nurse present at the circumcision both testified no narcotics were given to Atravius Coleman at the time of circumcision, neither Dr. Shukan nor the jury is required to believe that testimony, particularly in light of the missing circumcision operation records and the discrepancies between the Controlled Substances Log and the Labor Progress Notes. *Graham v. State*, 812 So. 2d 1150, 1153 (Miss. App. 2002); *Meshell v. State*, 506 So. 2d 989, 992 (Miss. 1987). See D8 at BMC 0212-0213; D2 at 86-89

A medical expert's causation opinions should not be excluded on the theory the opinions are not based on sufficient facts or data because there is a lack of direct evidence or certain facts in the medical records establishing causation. *Hubbard v. McDonald's Corp.*, 41 So. 3d 670, ¶¶ 27-28 (Miss. 2010) citing *Poole v. Avara*, 908 So. 2d at 720-25. "Under our standards for the admission of expert testimony, a qualified medical expert is permitted to extrapolate causation testimony from the patient's clinical picture although the medical records contain no objective medical evidence establishing causation." *Id.*

The medical records in *Hubbard* "did not establish the cause or significant contributing cause of Hubbard's rupture of membranes and preterm labor." The Plaintiff's experts based their opinions on their interpretation of the medical records in light of their experience, training, and expertise as qualified obstetricians and gynecologists. The Mississippi Supreme Court held it

was error to exclude the expert's opinions on his causation theory,

> because it was grounded in Hubbard's medical records; Dr. DeSalvo's experience, training, and expertise; and the medical literature. His opinions constituted a scientifically grounded theory of causation, not the "junk science" which the *Daubert* Court sought to preclude from jury consideration. *Huss v. Gayden,* 571 F.3d 442, 460 (5th Cir. 2009). The credibility of Dr. DeSalvo's testimony in light of the competing testimony of Dr. Rice or of other defense experts is a matter for the jury to weigh.

Similarly, it was error to exclude Dr. Shukan's causation testimony which was grounded in the medical records of Atravius Coleman and his mother along with discrepancies in the hospital's controlled substance records and the discrepancies between the testimony of Dr. McArthur and the nurse as to what the missing circumcision records would show in regard to analgesia used in connection with that procedure.

Daubert and *McLemore* do not require the literature supporting a medical causation expert's opinion to precisely match the circumstances of the case, nor do they require the support to come from the general conclusions of articles describing entire studies. See e.g., *Sullivan v. United States Dep't of the Navy*, 365 F.3d 827, 834 (9th Cir. 2004) (the District Court abused its discretion and invaded the province of the expert by requiring the texts to state the precise type of harm explained by the specialized testimony of a medical expert)

VII. Appellees and the Circuit Court Have Focused on the Correctness and Credibility of Plaintiff's Expert Opinions Rather than the Reliability of Their Methodology in Forming Their Opinions

In evaluating the reliability of an expert's opinions, the Court's "focus . . . must be solely on principles and methodology, not on the conclusions that they generate." *Hubbard* at ¶ 16 quoting *Daubert*, 509 U.S. at 595. In the present case, neither the Trial Court nor the Defendants have focused on the principles and methodology underlying the expert opinions. Instead, they have impermissibly focused on the conclusions Dr. Hayne and Dr. Shukan reached. The Trial Court required precise data on the half life of Meperidine in a neonate backed by enough studies to demonstrate scientific agreement on the half life of Meperidine in a neonate. The result of this requirement was to require Plaintiffs to meet both the rejected *Frye* general acceptance standard

and a heightened scientific certainty standard both of which were rejected in *Daubert*. Plaintiffs are not required to demonstrate that the conclusions of its experts on the appropriate half life of Demerol to be used in the present case are correct. They need only show that the methodology of their experts is based on sufficient facts and reliable methodology. *Id.*

VIII. Plaintiff Has Not Abandoned/Waived Its Position That Establishing The Exact Time, Amount, and Method of Exposing Atravius Coleman to Meperidine Is Not Necessary to Establishing Causation In This Case.

Bolivar Medical Center argues Plaintiffs waived any arguments that summary judgment should not have been granted because even without the excluded testimony of Dr. Shukan and Dr. Hayne there were material issues of fact on causation because Plaintiffs chose not to argue that point to the Trial Court. (Bolivar brief at p. 26) The only citation of authority or to the record to support this argument is a reference to the Order Granting Summary Judgment. That order does not say anything about waiver. It states that summary judgment is being entered because the Court is "of the opinion that said motion should be granted because without the excluded testimony, Plaintiffs' have no expert testimony to prove causation." The Order was approved by Plaintiffs only as to form. Furthermore, the correspondence between the parties' counsel and the Court makes it plain Plaintiffs explicitly conditioned their agreement to the form of the Order only if it contained language sufficient to "preserve for appeal the issue of whether Dr. Shukan's testimony without the extrapolation numbers is sufficient to meet the causation burden." Defense counsel's correspondence makes it clear he understood and agreed that the "issue of whether Dr. Shukan's testimony without the estrapolating [sic] numbers is sufficient to meet the causation burden" was preserved for appeal. See attachments 1 & 2 to this Brief; 4/30/09 and 5/5/09 letters.

> Waiver presupposes full knowledge of a right existing, and an intentional surrender or relinquishment of that right. It contemplates something done designedly or knowingly, which modifies or changes existing rights or varies or changes the terms and conditions of a contract. It is the voluntary surrender of a right. To establish a waiver, there must be shown an act or omission on the part of the one charged with the waiver fairly evidencing an intention permanently to surrender the right alleged to have been waived.

Union Planters Bank, N.A. v. Rogers, 912 So. 2d 116, 119 (Miss. 2005) quoting *Ewing v. Adams*, 573 So. 2d 1364, 1369 (Miss. 1990). Clearly, there was no waiver of this issue.

In Response to the Motion for Summary Judgment and the Motion to Exclude Dr. Shukan's Causation Testimony, Plaintiffs' submitted a Supplemental Affidavit by Dr. Shukan. In paragraph 6 of that Affidavit, Dr. Shukan states:

> Dr. Tibbs should have recognized that the combination of metabolic acidosis and depressed respirations are not part of hypothrophic left ventricular syndrome. He should have treated the metabolic acidosis more aggressively. *Regardless of the cause,* the metabolic acidosis must be treated more aggressively and certainly Dr. Tibbs should have used the life saving vasoactive medications earlier instead of saving them for the last few minutes of the child's life.

(R. 858) This statement by Dr. Shukan demonstrates that it is not necessary for Dr. Shukan to determine the role played by Meperidine in Atravius Coleman's death in order to provide the necessary evidence that Dr. Tibbs' negligence proximately caused Atravius Coleman's death. The documentation of Atravius Coleman's symptoms and particularly the documentation of his respiration and the results of two arterial blood gas tests demonstrate that Atravius Coleman was suffering from metabolic acidosis. It does not matter whether Atravius Coleman's metabolic acidosis was caused by an excessive dose of Demerol or something else. He had metabolic acidosis. Dr. Tibbs delayed in employing life saving vasoactive medications that could have saved Atravius Coleman's life if timely administered while he had a good chance of surviving. This opinion is in no way dependent upon the amount of Demerol administered to Atravius Coleman or his mother because it applies regardless of the cause of the metabolic acidosis.

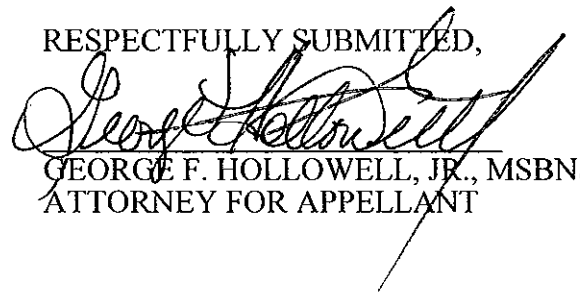
Similarly, Plaintiffs' theories of Bolivar Medical Center's liability are based on delay by the nurses in responding to signs of distress, in recognizing the serious decline in Atravius Coleman's condition and timely calling Dr. Tibbs, and in responding to Dr. Tibbs' orders for stat blood gas tests and treatments such as administering fluids through an IV. Again, it does not matter what caused the acidosis. The delays the hospital was responsible for further delayed the administration of life saving treatments and contributed to Atravius Coleman's death. These theories of liability are not dependent upon determining the exact amount of Demerol Atravius

Coleman was exposed to or the time of exposure.

CONCLUSION

The Trial Court in this case set a new standard for the admission of expert testimony which is considerably higher than the requirements set by this Court in *McLemore* or the requirements set for the Federal Courts in *Daubert*. In applying such a high standard requiring both general acceptance and scientific certainty, the Trial Court required far more than the Rules of Evidence require. The Trial Court applied an incorrect legal standard, and thereby abused its discretion, in excluding the testimony of Plaintiffs' experts. Furthermore, even without Dr. Hayne's and Dr. Shukan's testimony based on the half life of Demerol, there was sufficient direct and circumstantial evidence to make a jury issue on medical causation. Accordingly, the Trial Court's rulings should be reversed.

RESPECTFULLY SUBMITTED,



GEORGE F. HOLLOWELL, JR., MSBN [redacted]
ATTORNEY FOR APPELLANT

CERTIFICATE OF SERVICE

Pursuant to M.R.A.P. Rule 25(a), I hereby certify that I have mailed the original and three (3) true and correct copies of the above and foregoing Reply Brief of Appellant via First Class U.S. Mail to:

Hon. Kathy Gillis
Clerk, Supreme Court of Mississippi
P.O. Box 249
Jackson, Mississippi 39205-0249

I further certify that I have mailed a true and correct copy of the above and foregoing Reply Brief of Appellant via First Class U.S. Mail to:

Honorable Charles E. Webster
Circuit Court Judge
Post Office Drawer 998
Clarksdale, MS 38614-0998

L. Carl Hagwood, Esquire
WILKINS, STEPHENS & TIPTON, P.A.
P.O. Box 4537
Greenville, MS 38704-4537

Diane Pradat, Esquire
WILKINS, STEPHENS & TIPTON, P.A.
P.O. Box 13429
Jackson, MS 39236-13429

Kimberly N. Howland, Esquire
WISE, CARTER, CHILD and CARAWAY
P.O. Box 650
Jackson, MS 39205-0650

This the 22nd day of October, 2010.

GEORGE F. HOLLOWELL, JR., MSBN [redacted]
ATTORNEY FOR APPELLANT