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IN THE UNITED STATES DISTRICT COURT
CENTRAL DISTRICT OF ILLINOIS
SPRINGFIELD DIVISION

ESTATE OF AMON PAUL CARLOCK, JR., Deceased, by Mary L. Andreatta-Carlock, Executor,	)	
Plaintiff,	)	
v.	)	No. 08-3075
NEIL WILLIAMSON, AS SHERIFF OF SANGAMON COUNTY; ANTHONY SACCO, CHIEF DEPUTY; TERRY DURR, JAIL SUPERINTENDENT; WILLIAM STRAYER, ASSISTANT JAIL SUPERINTENDENT; LT. RON BECKNER, ADMINISTRATOR OF SANGAMON COUNTY JAIL; LT. CANDACE CAIN; LT. TAMMY POWELL; SGT. TODD GUY; CO KEVIN FURLONG; NURSE LEE ANNE BRAUER, R.N.; NURSE NIECEY WEST, L.P.N.; NURSE LUCY RAMSEY, L.P.N.; JOSEPH MAURER, M.D.; CHAUNCEY C. MAHER, III, M.D. and SANGAMON COUNTY,	)	
Defendants.	)	

OPINION

SUE E. MYERSCOUGH, United States District Judge.

This cause is before the Court on Plaintiff's Motion to Exclude

Certain Testimony of Mark Kroll, Ph.D. (Motion) (d/e 379). Neither party has requested a hearing. Because Kroll is sufficiently qualified to testify and his testimony is both sufficiently reliable and sufficiently relevant, the Motion is denied.

BACKGROUND

In this lawsuit, Plaintiff, the Estate of Amon Paul Carlock, Jr., deceased, by Mary L. Andreatta-Carlock, Executor, alleges that Carlock was a pretrial detainee housed at the Sangamon County Illinois jail from October 9, 2007, until his death on November 16, 2007. See Fourth Amended Complaint (d/e 138). Plaintiff alleges that Defendants were responsible for Carlock's death. The defendants in this case include the County Defendants–Neil Williamson, Anthony Sacco, Terry Durr, William Strayer, Ron Beckner, Candace Cain, Tammy Powell, Todd Guy, Kevin Furlong, Anne Brauer, Niecey West, and Lucy Ramsey–as well as the medical defendants–Joseph Maurer, M.D. and Chauncey C. Maher, III, M.D. Only the County Defendants are involved in this Motion.

In the Motion, Plaintiff identifies the issues in the case as including

the following: (1) whether the County Defendants willfully, recklessly, or maliciously (a) failed to perform cardiopulmonary resuscitation (CPR) or use an automated external defibrillator (AED); and (b) physically mistreated Carlock by restraining him face down and applying 285 pounds of pressure to his back; and (2) whether the tasering of Carlock contributed causally to his death.[1]

The County Defendants retained several expert witnesses, including Mark Kroll, Ph.D. Plaintiff now seeks to exclude certain testimony by Kroll. While Plaintiff concedes Kroll is qualified to testify as to his opinion that the taser did not cause or contribute to Carlock's death, Plaintiff asserts that Kroll "does not have the credentials or credible published authorities as back up supporting his criticism of Plaintiff's physician experts, or to render opinions as to the need for CPR

[1] The Fourth Amended Complaint contains § 1983 claims for excessive force, deliberate indifference to Carlock's medical needs and several state law claims. The allegations in the Fourth Amended Complaint include the following: that Carlock was placed face down, with his hands handcuffed behind his back and his legs shackled; Defendant Furlong held Carlock at the back of Carlock's neck and placed a portion of his 285 pounds on Carlock's back both before and after Carlock was tasered; Carlock became unresponsive and no jail personnel provided medical care or lifesaving measures; and Defendant Mauer failed to train nursing staff and correctional officers in the use of CPR and AED. See ¶¶ 33, 61, 80, 113(K).

or that prone restraint is never dangerous."

In particular, Plaintiff asserts Kroll should not be allowed to testify that (1) based in part on the delayed capillary refill found by the emergency medical technician (EMT), Carlock's cardiac arrest did not occur until 60 seconds or less before the ambulance arrived; and (2) there are no risks to face-down restraint even if weight is applied to the back. Plaintiff argues that Kroll is not qualified to testify on those matters, the testimony is not reliable, and the testimony is not relevant. See Kroll's Initial Report, p. 12 (opinion that Carlock's cardiac arrest occurred around the time of EMT arrival based on Carlock having a pulse until that time and based on the EMTs' notation of delayed capillary refill: "Any capillary refill would suggest that the cardiac arrest would have occurred less than 1 minute before this was noted"); Kroll's Supplemental Report, p. 7 (comment in response to expert report and deposition of Dr. Silerberg, noting that the peer-reviewed scientific literature does not support the conclusion that sitting on someone who is in the prone position with his hands cuffed behind his back interferes with

respiration); Kroll's Supplemental Report p. 12 (comment in response to deposition of Dr. Hubler, noting that "positional asphyxia was a popular speculation for in-custody-deaths" but, after scientific study, was found to have no basis).

ANALYSIS

"The admission of expert testimony is governed by Federal Rule of Evidence 702 and the principles outlined in Daubert [v. Merrell Dow Pharm., Inc., 509 U.S. 579, 589 (1993).]" Bielskis v. Louisville Ladder, Inc., ___ F.3d ___, ___ 2011 WL 5829771, at *4 (7th Cir. 2011). To determine whether to admit expert testimony, this Court must examine whether (1) "the witness is qualified,"(2) "the expert's methodology is scientifically reliable," and (3) "the testimony 'will assist the trier of fact to understand the evidence or to determine a fact in issue.'" Myers v. Illinois Central R.R. Co., 629 F.3d 639, 644 (7th Cir. 2010) (quoting Ervin v. Johnson & Johnson, Inc., 492 F.3d 901, 904 (7th Cir. 2007)); see also Kumho Tire Co., Ltd. v. Carmichael, 526 U.S. 137, 149 (1999) (concluding "that Daubert's general principles" also apply to

nonscientific experts). The test is a flexible one. Bielskis, ___ F.3d ___, ____ (7th Cir. 2011) (the district court performs a gatekeeping function when determining whether to exclude expert testimony). The party that proffers an expert's testimony must establish the admissibility of the testimony by a preponderance of evidence. Lewis v. CITGO Petroleum Corp., 561 F.3d 698, 705 (7th Cir. 2009).

A. Kroll Is Sufficiently Qualified to Testify About His Opinions on Capillary Refill and Prone Restraint

Plaintiff first argues Kroll is not qualified as an expert on the non-taser issues because he does not have the knowledge, skill, experience, or training as a physician to criticize physicians or give medical opinions on time of cardiac arrest or the physical effects of prone restraint. Plaintiff notes that Kroll does not have "a medical education and a licence" and the authorities he cited to support his medical opinions are "bogus." See Brief in Support, p. 6 (d/e 380).

To determine whether Kroll is qualified as an expert, this Court must compare the area in which Kroll has "superior knowledge, skill, experience or education with the subject matter of [his] testimony."

Carroll v. Otis Elevator Co., 896 F.2d 210, 212 (7th Cir. 1990). The fact that Kroll is not a medical doctor is not dispositive, so long as he has the relevant experience, knowledge, or training to form his opinions. See Crisostomo v. Stanley, 857 F.2d 1146, 1153 n. 18 (7th Cir. 1988) (pre-Daubert case noting that "[t]here is no reason why a witness who is not a medical doctor should be automatically disqualified as a medical expert, if he is otherwise well schooled in the field"); Wintz v. Northrop Corp., 110 F.3d 508, 513 (7th Cir. 1997) (finding the expert was not a medical doctor and also that his "experience, knowledge, and methodology were not sufficient to permit him to offer an expert opinion applying the principles of toxicology to a human being in this case"); Berry v. McDermid Transp., Inc., 2005 WL 2147946, at *2 (N.D. Ind. 2005) (citing cases and noting that "[i]ndividuals who lack medical degrees understandably may face difficulties in asking a court to treat them as qualified to testify as to medical questions"); but see also Goodwin v. MTD Products, Inc., 232 F.3d 600, 609 (7th Cir. 2000) (engineer was not qualified to give expert opinion concerning "the nature, scope, or

cause of an eye injury that resulted from contact with a wing nut which was discharged at a high rate of speed from a lawn mower" because he did not have a medical degree or other medical training); Wilcox v. CSX Transportation, 2007 WL 1576708, at *12 (N.D. Ind. 2007) (holding that nonmedical doctor could not testify as to the cause of the plaintiff's particular condition).

Kroll holds an M.S. and Ph.D. in Electrical Engineering. He is currently an adjunct full professor in biomedical engineering at the University of Minnesota and a principal in Mark Kroll & Associates, LLC.

Kroll's scientific speciality is electrophysiology–the interaction of electricity and the body–and bioelectricity–the effects of electricity on the human body." See Initial Report, p. 38; Affidavit, ¶ 2. Kroll explains in his Affidavit that bioelectricity "covers a crossover region between pure medicine and pure physical and electrical science/engineering."

Kroll researches and develops electrical devices to diagnose and treat disease. His primary focus is the effect of electrical shocks on the

human body. According to Kroll, his investment in this area has "resulted in every Implantable Cardioverter Defibrillator (ICD) made anywhere in the world licensing some of [his] patented improvements." Kroll further asserts that his "work on the effects of electricity on the human body has resulted in major improvements in defibrillation, which is the cornerstone of resuscitation from cardiac arrest" and that he is therefore, "by necessity an expert in resuscitation and cardiac arrest."

Kroll's curriculum vitae reflects numerous publications, including (1) book chapters on, among other things, cardioverter defibrillators and tasers; (2) abstracts, presentations, and nonindexed letters on topics including the electrical detection of coronary artery disease; and (3) full length papers and indexed letters on topics including defibrillation, the effects of respiration phase on ventricular defibrillation threshold, tasers, and coronary blood flow produced by muscle contractions induced by intracardiac electrical CPR during ventricular fibrillation. In addition, Kroll regularly lectures and teaches cardiologists about cardiac arrest, resuscitation, and defibrillation.

Finally, Kroll's Affidavit tendered in support of his testimony (d/e 382-4) reflects that his research in respiration has led to numerous inventions for improved breathing as reflected by seven U.S. patents. He also identified five publications involving respiration.

This Court finds Kroll is sufficiently qualified, based on his knowledge, training, and experience to give his opinion on capillary refill as an indicator of the timing of cardiac arrest and the risks, or lack thereof, of prone restraint on respiration. Although he is not a medical doctor, he is qualified by training and experience on issues relating to the cardiovascular system, resuscitation, and respiration. Therefore, the County Defendants have met their burden of proof in showing Kroll is qualified to testify on the issue of capillary refill and respiration. See, e.g., Walker v. Soo Line R.R. Co., 208 F.3d 581, 591 (7th Cir. 2000) ("Rule 702 specifically contemplates the admission of testimony by experts whose knowledge is based on experience").

B. Kroll's Testimony Is Sufficiently Reliable

Plaintiff next challenges the reliability of Kroll's opinions. Plaintiff

argues that Kroll's statements are unsupportable, subjective, and not based on any credible scientific knowledge or theory. Plaintiff asserts that capillary pressure is found in corpses long after death. Plaintiff further asserts that the "Chan study", one of the studies on which Kroll relies, was based on studies of healthy adults and does not apply to Carlock's situation (58 years old, critically ill, and overweight). Finally, Plaintiff argues Kroll's opinions are not reliable because "his role in this litigation is not to uncover the truth, but appears to be criticism of Plaintiff's physician experts." Brief in Support, p. 7.

To aid courts in assessing the reliability of scientific expert testimony, the Supreme Court, in Daubert, set forth a non-exhaustive list of "guideposts" for consideration: (1) whether the scientific theory can be and has been tested; (2) whether the theory has been subjected to peer review and publication; (3) the theory's known or potential rate of error when applied; and (4) whether the theory has been "generally accepted" in the scientific community. Daubert, 509 U.S. at 593-94; see also Chapman v. Maytag Corp., 297 F.3d 682, 687 (7th Cir. 2002). In

addition to these factors, the 2000 Advisory Committee's Notes to Federal Rule of Evidence 702 suggest that a court also consider (5) whether "maintenance standards and controls" exist; (6) whether the testimony relates to "matters growing naturally and directly out of research they have conducted independent of the litigation, or whether they have developed their opinions expressly for purposes of testifying"; (7) "[w]hether the expert has unjustifiably extrapolated from an accepted premise to an unfounded conclusion"; (8) "[w]hether the expert has adequately accounted for obvious alternative explanations"; (9) "[w]hether the expert is being as careful as he would be in his regular professional work outside his paid litigation consulting"; and (10) "[w]hether the field of expertise claimed by the expert is known to reach reliable results for the type of opinion the expert would give." Fed. R. Evid. 702 advisory committee's note (2000 amends.) (internal quotation marks omitted). Because the Daubert inquiry is a flexible one, an expert's testimony need not satisfy each of the above factors to be admissible. Chapman, 297 F.3d at 687.

Kroll explained his "opinion methodology" and "scientific method" as follows. Kroll's Initial Report, p. 38. Kroll developed his opinions using the disciplines of "electrophysiology, electrical engineering, biomedical engineering, cardiovascular physiology, scientific methods, mathematics, and physics." Id. In addition, he used "qualitative and quantitative research methodologies in addition to his education, training, experience, and literature review." Id. Kroll also reviewed the medical records, Federal Bureau of Investigation interviews, depositions, and investigation reports.

To form his opinion regarding capillary refill as a factor in determining whether the cardiac arrest occurred, Kroll tendered a Second Supplemental Declaration. Kroll explained that "[c]apillary refill requires oxygenation of the tissue beneath the nail bed" and requires filling pressure. Kroll relied on eight peer-reviewed articles for his opinion. In particular, Kroll pointed to one particular study that found oxygenation was reduced by 80% within 60 seconds of arrested circulation in the human finger. He pointed to another study that showed that humans

had some filling pressure 20 seconds after cardiac arrest and that filling pressure fell to zero in animals after 30 to 50 seconds. Kroll also noted in his Second Supplemental Report that capillary refill requires oxygenation. Relying on the Van Riper study, venous oxygen levels in humans decreased by 30% within 45 seconds of cardiac arrest. Kroll noted:

> A person with normal circulation could still have fingerbed "pinking" after release with a 30% reduced oxygen level. The diabetic subject had ischemic toes from his poor peripheral circulation. Diabetic patients with peripheral vascular disease have a typical capillary refill time of 5 seconds (as opposed to the normal cutoff of 2 seconds for 'delayed.[)]' [footnote omitted]. Applying that correction suggests that the subject would not have any capillary refill after 45 seconds.

Second Supplemental Report, p. 2.

Regarding the effects on respiration in the prone position with weight applied, Kroll relied upon peer-reviewed articles and authorities relating to positional asphyxia, restraint position, and prone restraint for his opinion. One of the articles upon which Kroll relied– the "Chan study"– examined the "ventilatory and metabolic demands in health

adults when placed in the prone maximal restraint position" with 90.1 or 103.2 kg of weight on the back. See Chan study, attached to Second Supplemental Report.

Examining the relevant factors, this Court notes that the theories–delayed capillary refill after cardiac arrest and the effects of prone restraint on respiration– have been tested and subjected to peer review and publication. See Daubert, 509 U.S. at 592 ("an expert is permitted wide latitude to offer opinions, including those not based on first-hand knowledge or observation"). Kroll relied on numerous studies from other individuals and is qualified to extrapolate from those studies. See, e.g., Cummins v. Lyle Industries, 93 F.3d 362, 369 (7th Cir. 1996) (noting that "hands-on testing" is not "an absolute prerequisite to the admission of expert testimony" and that an expert may review data generated by others in the field); Manning v. Buchan, 357 F.Supp.2d 1036, 1044 (N.D. Ill. 2004) ("an expert is not required to substantiate his opinions through testing particularized to the specific case if the science he is using has already been shown experimentally to be

reliable"); Wetherill v. University of Chicago, 565 F.Supp. 1553, 1564 (N.D. Ill. 1983) ("Rule 702 expressly permits expert witnesses to form their opinions by studying the work of others rather than through first-hand empirical observation"). Kroll's extrapolation appears rationally based on the studies he cited.

In addition, these theories appear to be generally accepted in the scientific community, although there is some debate. See, e.g., Giannetti v. City of Stillwater, 2006 WL 5100544, at *2 n. 3 (W.D. Okla. 2006) (noting the scientific literature is divided on positional asphyxia but also noting that "the amendments to Rule 702, post-dating Daubert, are 'broad enough to permit testimony that is the product of competing principles or methods in the same field of expertise'" (quoting Fed.R.Evid. 702)).

Plaintiff's objections to the reliability of Kroll's opinions go to the weight of the evidence, not its admissibility. Plaintiff may, on cross-examination, challenge Kroll's theories, point out that debate in the scientific community, and question Kroll's credibility. See Daubert, 509

U.S. at 596 ("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"); see also Smith v. Ford Motor Co., 215 F.3d 713, 718 (7th Cir. 2000) ("The soundness of the factual underpinnings of the expert's analysis and the correctness of the expert's conclusions based on that analysis are factual matters to be determined by the trier of fact"). Moreover, Plaintiff can present Plaintiff's own expert witness' testimony to discredit Kroll. See Daubert, 509 U.S. at 596. Applying the "flexible" Daubert standard and in the exercise of the Court's discretion, the Court finds Kroll's opinions are sufficiently reliable.

C. Kroll's Testimony Is Sufficiently Relevant

Although Plaintiff makes a passing reference to Kroll's opinions not being relevant, Plaintiff does not make any specific argument in support thereof. This Court finds that Krolls' opinions are sufficiently relevant. Kroll's testimony will assist the jury with understanding the evidence or determining a fact at issue. See Fed.R.Evid. 702 (providing that the

knowledge must "assist the trier of fact to understand the evidence or to determine a fact in issue"). Moreover, the testimony "fits" the issues about which Kroll is testifying. See Chapman, 297 F.3d at 687 (noting that the district court must determine whether the testimony "'fit[s]' the issue to which the expert is testifying" (quoting Porter v. Whitehall Labs, Inc., 9 F.3d 607, 614 (7th Cir. 1993))).

CONCLUSION

For the reasons stated, Plaintiff's Motion to Exclude Certain Testimony of Mark Kroll, Ph.D. (d/e 379) is DENIED.

ENTER: January 10, 2012

FOR THE COURT:

s/Sue E. Myerscough
SUE E. MYERSCOUGH
UNITED STATES DISTRICT JUDGE