HEADNOTE:

Stanley Sugarman, et al. v. Chauncey Liles, Jr., No. 1460, September Term, 2016.

SUFFICIENCY OF EVIDENCE; EXPERT TESTIMONY; EPIDEMOLOGICAL STUDIES

Epidemiological studies indicating a causal relationship between childhood lead exposure and problems with attention, in conjunction with Mr. Liles' medical and neurophysiological records, provided a sufficient factual basis for the circuit court to permit the jury to consider whether Mr. Liles' cognitive impairments in processing speed and auditory encoding, measures of attention, were caused by lead exposure. And, the expert's opinion, based on the Lanpher Study, that the plaintiff lost four IQ points as a result of lead exposure, had a sufficient factual basis.

Additionally, there was a sufficient basis for testimony indicating that Mr. Liles would suffer a loss of earning capacity in the amount of $1,698,808. Dr. Conte, an economics expert, explained that this amount reflected the difference between the wages an individual could receive if he or she were able to attain an Associate's degree (plaintiff's earning potential absent injury), i.e., $3,456,127, and the wages of an individual with only high school education, plus some college (earning capacity with cognitive deficits), i.e., $1,757,320. This evidence was sufficient to present the issue of damages to the jury.

Circuit Court for Baltimore City
Case No. 24-C-14-005808

REPORTED

IN THE COURT OF SPECIAL APPEALS

OF MARYLAND

No. 1460

September Term, 2016

STANLEY SUGARMAN, ET AL.

v.

CHAUNCEY LILES, JR.

Graeff,
Friedman,
Thieme, Raymond G., Jr.
(Senior Judge, Specially Assigned),

JJ.

Opinion by Graeff, J.

Filed: November 1, 2017

Chauncey Liles, Jr., appellee, filed a complaint against Ivy Realty, Inc. and Stanley Sugarman (collectively "Ivy Realty"), appellants, in the Circuit Court for Baltimore City, alleging injury and damages caused by lead paint exposure at a residence (the "Property") managed, maintained, operated, and controlled by Ivy Realty. At trial, the parties stipulated that, due to Ivy Realty's negligence, Mr. Liles was exposed to deteriorating paint at the Property, and his exposure to lead paint substantially contributed to two documented elevated blood lead levels. The only remaining questions for the jury, therefore, were whether Mr. Liles' lead exposure caused injury, and if so, what, if any, damages were incurred.

Mr. Liles presented four expert witnesses at trial to testify to his alleged injury and damages. At the close of his case, and again at the close of all evidence, Ivy Realty moved for judgment, asserting that the expert testimony was speculative and lacked a factual basis to support the causation and damages opinions, and the evidence was insufficient to establish that Mr. Liles had suffered a legally compensable injury. The court denied the motions. The jury ruled in favor of Mr. Liles, and judgment was entered against Ivy Realty in the amount of $1,277,610.[1]

On appeal, appellant presents three questions for this Court's review, which we have rephrased and consolidated, as follows:

[1] The docket entries indicate that the jury awarded Mr. Liles $1,302,610 in damages, $600,000 in non-economic damages and $702,610 in economic damages. Following a reduction of the jury verdict in accordance with Maryland's statutory cap on non-economic damages, a final judgment was entered in the amount of $1,277,610.

1. Was there sufficient evidence for the trial court to submit the case to the jury on the issue whether Mr. Liles' lead exposure caused injury?

2. Was there sufficient evidence for the trial court to submit the case to the jury on the issue whether any injury caused by the lead exposure resulted in damages?

For the reasons set forth below, we shall affirm the judgment of the circuit court.

FACTUAL AND PROCEDURAL BACKGROUND

I.

Mr. Liles' Medical and Educational History

Mr. Liles was born on February 17, 1998. When Mr. Liles was two and one-half years old, he had a blood lead level of 11 mcg/dL, and at age three, it was 10 mcg/dL.[2] Mr. Liles' medical records indicate that, at two years old, he suffered a seizure due to appendicitis. He had an emergency appendectomy and was hospitalized for two weeks, but he made a full recovery. In high school, Mr. Liles suffered a broken thumb. The thumb healed completely, and he suffered no long term effects from that injury.

When Mr. Liles was nine years old, several close family members died within a one-year time period. Mr. Liles experienced grief and anxiety, for which he received counseling. No developmental concerns were documented within his medical records. The records indicated that Mr. Liles was "bright, cooperative and . . . functioning at the appropriate grade level (3rd)." His level of academic performance was assessed at "above average."

[2] Blood lead levels are measured in micrograms per deciliter.

In elementary school, Mr. Liles performed consistently at or above grade level until his 4th and 5th grade school years, when he had increased absences following the death of his family members and his treatment for anxiety. As a result of his performance, Mr. Liles attended summer school, and he received academic support, including "one on one support," "small grouping," "individualized help on his math skills and test taking practice," "extra response time," "extended time to complete assignments," and "repetition of directions." In middle school, Mr. Liles raised his grades into the "70s, 80s, and 90s."

In May 2016, Mr. Liles graduated from Baltimore City College High School ("City College"), a prestigious college preparatory school that requires admittees to pass an entrance examination. Mr. Liles described his grades at City College as terrible, stating that he had "a mid-C average," and the "only A's" he received were in foreign language, "weight training, gym class, anything physical."[3]

Mr. Liles blamed his poor grades in high school on his inability to focus, stating that he gets distracted a lot, does not like sitting still, and "just can't grasp things as fast as other people do." These issues started when he was young, but "as the work got harder, [he] couldn't get it." He stated that his parents had both done well in school, and they encouraged him to do well, which was his goal, but he "couldn't." His weighted Grade

[3] In his deposition, which was read to the jury at trial, Mr. Liles explained that he broke his thumb playing football in his freshman year, and as a result, he had to teach himself to write with his right hand. He stated that part of the reason he failed English and typing, and had to attend summer school, was because he could not write. At trial, however, Mr. Liles testified that he stated that his thumb was the reason for his poor grades because he was "not ready to humiliate himself," so he "made [up an] excuse."

Point Average ("GPA") upon graduation from City College was 3.3, although his unweighted GPA was 2.1. He was ranked 194 out of 301 students.

Mr. Liles tested at or above grade level on all Maryland School Assessment testing and passed his High School Assessment tests. His scores on the PSAT were in the 20th, 24th, and 54th percentiles during his 9th, 10th, and 11th grade years, respectively.

Following high school, Mr. Liles was accepted to West Virginia University ("WVU") and Bowie State University ("BSU"). He decided to attend BSU because it was less expensive and closer to home. Mr. Liles stated that he would "not be able to focus" at WVU and would be easily distracted away from his family, without supervision.

With respect to Mr. Liles' family members, his mother, Daronda Liles, is a high school graduate, with some college experience. His father, Chauncey Liles, Sr., is a high school graduate employed as a truck driver.[4] Mr. Liles has four siblings. The oldest three siblings all completed high school, and one is enrolled at the University of Maryland, Eastern Shore studying pre-med. His youngest sibling is still in grade school.

[4] Ivy Realty points out that the educational and vocational history of Mr. Liles' father was not admitted into evidence at trial, but rather, it was assumed through the questions of counsel posed to Ivy Realty's vocational expert, Scott Beveridge, Ph.D. Ivy Realty "stipulates that the questions correctly stated the facts known from the father's deposition testimony."

II.

Mr. Liles' Expert Witnesses

A.

Robert Kraft, Ph.D.

Dr. Robert Kraft, a licensed psychologist, testified as an expert in neuropsychology, the "relationship between behavior and the central nervous system functioning."[5] A clinical neuropsychology assessment is performed on an individual to "determine an individual's strengths and weaknesses in their brain functioning . . . to determine if they have any sort of neurodevelopmental disorder or brain-related impairments that may impact them, and to identify what those are." Brain-related impairments are not physically visible through neuroimaging, and it requires "specialized assessments in order to identify them." The assessment involves observing the individual, taking a history, and giving a "battery of tests that are designed to be presented under specific conditions and that an individual is expected to display specific behavior in response to these tests."

Dr. Kraft's neuropsychological examination of Mr. Liles consisted of an interview, as well as a number of neuropsychological tests that Dr. Kraft administered to assess intelligence, memory, learning, academic achievement, executive functioning, attention, language, visual-spatial and perceptual motor functioning, and effort. Mr. Liles has a "full scale IQ of 94," which "falls into an average range," and his "performance on math was in the solid average range of the 61st percentile." Dr. Kraft stated, however, that having an

[5] Dr. Kraft's videotaped *de bene esse* deposition was played for the jury at trial.

average range IQ score does not mean that there is no evidence of brain impairment, and that Mr. Liles' "two index scores that are most sensitive to attention and concentration" were "significantly lower than his performance in perceptual reasoning," which indicated the presence of "mild impairment." Specifically, Dr. Kraft stated that Mr. Liles had mild deficits "with respect to auditory encoding of information in the working memory, and information processing speed," both of which "are factors of attention." In regard to both of these factors, Mr. Liles scored 86, which is statistically in the 18th percentile, and was "significantly lower than his performance in perceptual reasoning," which was 104.[6] The discrepancy between the index scores and the IQ test was wide enough that it "is not considered to happen by chance alone," but rather, it suggests "that there is some process that is responsible for the discrepancy."

Dr. Kraft explained that auditory encoding is a person's "ability to hold information in mind for immediate manipulation and to make some sort of output with that information that you're holding in memory." For example, a waiter or waitress who takes orders without writing the orders down is using auditory encoding. Individuals "use auditory encoding in every aspect of life," and that information is stored until the individual has completed the task, and then the information can be forgotten.

Processing speed is an individual's "ability to independently focus and complete a task in a self-directed manner." For example, a student who sits down to study, or an adult

[6] A "perceptual reasoning index measures an individual's ability to solve problems using visual-spacial relationships without language."

who sits down to read a book or complete a writing task, requires information processing speed. Mr. Liles' ability "to do that independently . . . is lower than it should be based on his intellectual functioning and suggests a mild impairment in that area." Dr. Kraft suggested that Mr. Liles' mild deficit could be accommodated, stating that, although Mr. Liles "may take a little longer than the average peer," he typically completes tasks "with accuracy and not a lot of compulsive errors."

Dr. Kraft agreed that Mr. Liles did not suffer from any deficits in IQ, executive function, the visual-spatial realm, speech and language, or fine and gross motor skills. Mr. Liles scored high average to average on another test for auditory attention, scoring higher than 75% of the general population on one subtest and in the 50th percentile on another. Dr. Kraft described the tests on which Mr. Liles scored the highest as "logical memory tasks and visual reproduction tasks," both of which "involve[] learning the information and storing it." Dr. Kraft further described Mr. Liles' "language skills [as] average or better," and his "comprehension of instructions, which is a receptive language kind of task," as "in the average range." Mr. Liles' "[v]erbal fluency was high average."

As part of his evaluation, Dr. Kraft reviewed Mr. Liles' school records. Mr. Liles began to show some mild educational problems in fourth grade, and he was provided with math tutoring. In fifth grade, Mr. Liles "performed more poorly," and the teacher's notes indicated that Mr. Liles was provided with accommodations, including "one-on-one teacher supports," "extra response time," and "extended time to complete assignments," which Dr. Kraft thought was significant "because those are the exact accommodations that

would be afforded to an individual who's having attention problems, particularly involving their ability to process information in a timely manner," which was "consistent with" Dr. Kraft's findings during the evaluation. Dr. Kraft was aware that Mr. Liles had suffered deaths in his family during the fourth and fifth grades, and had been receiving counseling, but he opined that Mr. Liles would have needed accommodations regardless of this family circumstance.

Dr. Kraft noted that Mr. Liles could have obtained B's in school because the "deficits are mild, and they may not always show up in every school year." In that regard, he stated that Mr. Liles may have had "courses that are easier than others, teachers that he click[ed] with better than others, and not necessarily need[ed] accommodations or [had] to struggle to adapt to the deficits." In other words, Mr. Liles' "deficits aren't always apparent in terms of how he would function at school . . . . if he's able to adapt and accommodate in some way for them."

B.

Jacalyn Blackwell-White, MD

Dr. Blackwell-White, who was admitted as an expert in pediatrics and childhood lead poisoning, had seen hundreds of children in her practice that had elevated blood lead levels.[7] She explained that lead is a neurotoxin, "a substance which causes damage to the central nervous system," i.e., the "brain and the way the brain functions." Children are

[7] The circuit court denied the defense motion in limine to exclude Dr. Blackwell-White's opinion regarding causation.

more susceptible to brain injuries from neurotoxins because their brain is rapidly developing, and lead exposure interferes with the neurotransmitter which transmits messages from "one neuron to another" through the myelin sheath. The "learning pathways" are disrupted, which "in real-speak [means] that "attention is going to be affected. You're not going to have a nice message go from one neuron to another." The damage that happens to a child's brain from lead poisoning is permanent.

Dr. Blackwell-White stated that the Centers for Disease Control ("CDC"), which "issue[s] standards and protocols for diagnosis and treatment of children who have elevated blood lead levels," has set the current reference level at five micrograms per deciliter of blood-lead, i.e., 5 mcg/dL. Previously, in the "early 80s," the reference level was 25 mcg/dL. It was lowered to 15 mcg/dL, then to 10 mcg/dL, and most recently, in 2012, it was lowered to 5 mcg/dL. The reference level was lowered based on medical literature and many studies indicating that blood lead levels under 10 mcg/dL were damaging to children.

Dr. Blackwell-White reviewed Mr. Liles' medical records, which indicated that his blood lead levels around the year 2000 were 10 mcg/dL and 11 mcg/dL. The reference level for the CDC at that time was less than 10 mcg/dL.

Dr. Blackwell-White also discussed the Environmental Protection Agency's ("EPA") Integrated Science Assessment ("EPA-ISA") on lead.[8] The EPA is a regulatory

[8] Mr. Liles asserts that, because the EPA-ISA chart was admitted into evidence without objection, and there was no motion in limine to preclude its admission into

agency that surveys the impact of health concerns to the population, and it reviewed years of literature regarding "the impact of lead on the environment and on the population." Dr. Blackwell-White testified that the EPA-ISA found that there is a causal relationship between childhood lead exposure and certain cognitive problems, including "attentional problems in children – impulse control . . . . and hyperactivity." She explained that these problems were found in children with lead levels between 7 mcg/dL and 14 mcg/dL, and "cognitive IQ point loss was caused by early lead exposure." Mr. Liles' blood lead levels were 10 and 11, "within the range." Dr. Blackwell-White testified that "many studies" link lead exposure in childhood to loss of IQ points, citing two leading studies that "looked at the impact of IQ loss in children for lead levels under 10."

In reaching her opinion in this case, Dr. Blackwell-White relied, in part, on the EPA-ISA's determination of a causal relationship between lead exposure and cognitive defects. After reviewing Mr. Liles' medical records, Dr. Blackwell-White opined that Mr. Liles suffered lead poisoning as a child. The basis for that opinion was Mr. Liles' two elevated lead levels at ages two and one-half and three.

Dr. Blackwell-White also reviewed Dr. Kraft's neuropsychological evaluation reports, on which she relied heavily. Dr. Kraft's report indicated that Mr. Liles had

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evidence, the issue of causation was not preserved for this Court's review. In its Reply Brief, however, Ivy Realty points out that the "question before the Court is whether the evidence provides a sufficient basis for the expert or the jury to conclude beyond speculation that lead exposure caused injury," and the "lack of an objection to admitting the document into evidence is . . . not consequential to this Court's review of whether the evidence on the record was sufficient to overcome the properly made Motion for Judgment." We agree with Ivy Realty and shall address the issue of causation.

cognitive impairments in processing speed and auditory encoding, measures of attention. Dr. Blackwell-White testified that, in her opinion, Mr. Liles "suffered brain damage as a result of his early lead exposure," and the cognitive deficits identified by Dr. Kraft were permanent and caused by Mr. Liles' exposure to lead.

Dr. Blackwell-White noted that one of the other leading studies, "the International Pooled Analysis by Dr. Bruce Lanphear" (the "Lanphear Study"), concluded that lead, independently of "other things going on in these children's lives," was responsible for IQ loss. Based on the Lanphear Study, Dr. Blackwell-White opined that Mr. Liles had lost four IQ points as a result of his elevated blood lead levels.

On cross-examination, Dr. Blackwell-White agreed that a history of emotional distress potentially could put a child at risk for cognitive difficulties. She further testified that the EPA-ISA is not typically relied upon by pediatricians in their clinical practice, and she "came across it through her work as an expert in litigation." She acknowledged that the CDC had also reviewed the epidemiological literature that was available in 2012, but it did not make any statements of causality. Indeed, the CDC stated in 1991 "that adverse effects of blood levels of 10 to 14 are subtle and are not likely to be recognized or measurable in the individual child."

When asked whether the causal connection found by EPA-ISA between lead and attention included the specific attention deficits found by Dr. Kraft, i.e., "auditory encoding and processing speed," Dr. Blackwell-White stated:

> Not only the EPA, but a good much of the lead literature involving children speaks to attention. They don't parse it out as to what kind of attention. They

> are using the umbrella term "attention". And so it is in my opinion that the deficits that Dr. Kraft found are part of that umbrella term "attention".

Dr. Blackwell-White opined that every child exposed to lead loses IQ points. This opinion was based completely on the epidemiological literature, which is "all we have." She cited the Lanphear Study, concluding that exposure to up to 10 mcg/dL could result in a loss of IQ of two to five points.

Dr. Blackwell-White agreed that a significant amount of cognitive ability is inherited. In response to the question whether she agreed that not every child exposed to 10 mcg/dL would lose four IQ points, Dr. Blackwell-White stated that they would lose IQ points, but she conceded that she could not "calculate exactly the number." She also agreed with a study stating that the impact of lead is difficult to isolate from socio-environmental variables.

C.

Mark Lieberman

Mark Lieberman, Mr. Liles' expert in vocational rehabilitation, testified that a vocational rehabilitation expert assesses

> how the person is now, what they're likely to be able to do in terms of learning new skills, what types of jobs they're going to be likely able to get, how much income can they earn, as compared to what they would have been capable of achieving had they not had the issues that they experience[d].

In conducting vocational rehabilitation assessments, Mr. Lieberman used a standard methodology called the "RAPEL" method, which assesses a person's vocational prospects based on an evaluation of: "Rehabilitation" recommendations; "Access" to the labor

market; "Placeability" of an individual in the labor market; "Earning capacity"; and any Labor force participation.

As part of the assessment, Mr. Lieberman conducted an interview of Mr. Liles and his mother, and he reviewed documents, including school records and Dr. Kraft's neuropsychological evaluation. For purposes of his assessment, however, he did not put "a whole lot of stock on how" Mr. Liles performed in his early years of school, because "[t]hat's not really a vocational issue."

With respect to Dr. Kraft's evaluation, Mr. Lieberman stated that there were "three main things [he was] looking for: IQ, academic functioning, and any issues that might affect the person's maximum ability to use their intelligence." In terms of IQ, Mr. Liles was "right around a 94. 100 is dead-set average. So right in the range we typically expect the person to be able to graduate high school." Mr. Lieberman opined that, based on that number alone, Mr. Liles could probably get an Associate degree, noting that "about 100 is what we expect for an Associate." Mr. Lieberman's assessment of Mr. Liles' testing results was as follows:

> Spelling was great. Spelling was 108. So reading – spelling a little bit better than average. And math was dead-set average. Those were pretty good. But what I saw was, although we had average IQ and a little bit lower academics, but pretty close, there were major cognitive issues that affects his ability [t]o learn.
>
> And that comes down to problems with attention – and I'm reading right off my notes – auditory encoding, and information processing speed.
>
> ***
>
> When you have these types of issues, it affects your ability to learn when you're sitting, listening to a lecture. Because you got to hear the

> information, quickly process it based on other stuff you know, and put everything together to understand the new concept that's being presented.

As part of his evaluation, Mr. Lieberman also administered some tests to Mr. Liles, including the Career Ability Placement Survey ("CAPS"), which "includes mechanical reasoning, spatial relations, verbal reasoning – which is paragraph comprehension – math, there's a grammar section, word knowledge where you have to understand the meaning of words." Mr. Liles scored "in the below-average range . . . compared to individuals [in] the tenth to twelfth grade."[9] Mr. Liles' "biggest weakness" was in reading comprehension and math, but Mr. Lieberman stated that he was "going to probably put more emphasis on the academic testing done by the psychologist. I think his reading's okay." Mr. Lieberman testified that, overall, Mr. Liles "had the academic skills of a high school graduate," and he expected that, after high school graduation, Mr. Liles would go to college, but problems would occur then because "[c]ollege relies on your ability to listen to a lecture, understand what you read in the textbooks, put them together to understand the concept." It requires "more in-depth ability to understand what you're hearing, to go to a lecture hall with 50 to a couple 100 people, and being able to quickly process information that you hear." He saw Mr. Liles "being able to pass some classes, but eventually hitting that brick wall – the point where he's not going to be able to get the Associate degree."

Mr. Lieberman opined that, given his deficits, Mr. Liles would have the earnings potential of an individual with a high school diploma and "some college," and without his

[9] Mr. Liles was in 11th grade at the time of the testing.

deficits, he would have the earnings of an individual with an Associate's degree. He further opined that Mr. Liles fits the definition of a cognitively disabled person, and as a result, he will have a "much harder time" attaining and maintaining work, and he will earn less than an individual that does not have these issues.

D.

Michael Conte, Ph.D.

Michael Conte, Ph.D., Mr. Liles' expert in economics, explained that, to understand the likelihood of an individual he is evaluating competing in the labor market, he must rely on the opinions "offered by someone qualified in the area of vocational rehabilitation," such as Mr. Lieberman. If a vocational expert identifies a cognitive disability, he will "take that into consideration in terms of evaluating how long that person is likely to actually work over the balance of their lifetime," as "cognitive ability has a demonstrable impact on what's called work-life expectancy." To formulate his opinions, Dr. Conte factors in certain assumptions, including sex, educational attainment, i.e., "the highest level of education that you've been certified to achieve," and work-life expectancy. In Mr. Liles' case, Dr. Conte's assumptions, based on Mr. Lieberman's report and opinions, were as follows:

> Mr. Liles suffers from a cognitive disability, and . . . on the basis of Mr. Lieberman's opinions, that he would most likely have been able to compete in the labor market as an Associate's degree holder, absent the severity of his current deficits.
>
> That at this point in time, however, he manages to proceed in the course of obtaining additional educational credits, that when he decides to

> enter the competitive labor market, he will most likely be able to compete at the level of a high school graduate with some college.

Dr. Conte testified that Mr. Liles' loss of earnings was the difference between the average wages for individuals with the educational attainment of an Associate's degree (earning potential absent injury), i.e., $3,456,127, and the average wages of individuals with the educational attainment of high school plus some college (earning potential assuming four-point IQ loss and cognitive deficits), i.e., $1,757,320. He opined that Mr. Liles sustained a loss of earnings due to his injuries in the amount of $1,698,808.[10] Dr. Conte subsequently testified that educational attainment was not important to his analysis, stating that the part of Mr. Lieberman's opinions on which he relied was that, "irrespective of his actual educational attainment, [Mr. Liles] will most likely be able to command a wage commensurate with that of an individual with high school plus some college.

III.

Ivy Realty's Expert Witnesses

A.

David Nelson, MD

Dr. David Nelson, an expert in pediatrics, epidemiology, and childhood lead exposure, testified that epidemiological studies are "designed to determine . . . risk factors

[10] Dr. Conte testified that Mr. Liles' work-life expectancy was 21.2 years, whereas if "he was not cognitively disabled and could compete at the level of an Associate's degree holder, his work-life expectancy would be 38.7 years."

for various conditions."[11] For example, an epidemiologic study on smoking showed that there is a strong association between smoking and lung cancer. Epidemiologic studies, however, do not show that a person who is at risk for an injury has suffered that injury. Rather, the studies "talk about risk . . . for the population" as a whole. Thus, because epidemiologic studies show that there is a very high risk of lung cancer if a person smokes, a clinician with a patient who smokes "can make certain assumptions about whether the smoking is actually [a] contributing . . . cause to the lung cancer."

Epidemiological literature does not determine relative risk between lead exposure and certain outcomes. To "determine relative risk, you have to have a . . . before and after," i.e., "[a] person's healthy, is exposed to something, and then develops into disease." None of the lead studies, however, measured a child before and after exposure to lead and saw a drop in IQ.

With respect to causation, Dr. Nelson explained that:

> The epidemiologic studies do not determine causation per se. They determine our associations. They are determinations made by the individual, groups of individuals, regulatory by whomever to determine whether the weight of the evidence in the literature is sufficient to say it's not just an association, but actually is causation.
>
> And there's no definition of what determines absolute causation. And, it's to some degree, it can even be the eye of the beholder. One group can look at something and say well I think there's enough evidence to say that those associations reached the level of causation, and another group may not because there's nothing definitive that you . . . can rely [on] and say this is absolutely the case.

[11] Dr. Nelson's videotaped *de bene esse* deposition was played for the jury at trial.

Aside from the EPA, Dr. Nelson was aware of no other group that had determined a causative association between lead exposure and IQ loss.

Dr. Nelson explained that, with low blood lead levels, it is "very difficult . . . to apply" causation to an individual. Although, on a population basis, "you can make a statement [that] . . . . cognitive function is affected by lead at lower levels," it is difficult to apply that to an individual "because you don't know if that individual really had an effect or not." When the EPA, or anyone else, makes a conclusion that epidemiological evidence establishes a causative relationship, they mean it is a risk factor. In other words, "causative associations in epidemiological studies mean that an exposure can cause an outcome, rather than that an exposure causes the outcome."

With respect to blood lead levels, Dr. Nelson opined that, based on the epidemiological literature, as the blood lead levels get significantly higher, "you get more comfortable with your judgment that the risk factor may actually be causing the problem in the individual." At low levels, however, "because it contributes so little and has such little effect, if it has any," it is difficult to make a determination of cause for the individual. Dr. Nelson stated that a blood lead level of 10 mcg/dL would not be significant in making a determination of causation, but a blood lead level of 20 mcg/dL or higher would be "more likely to cause a problem than is lead at lower levels." Maryland 2016 guidelines, in fact, do not make any recommendations for clinical intervention for children with blood lead levels under 20 mcg/dL that are different from those for any well child, nor did the CDC's 2012 statement.

Dr. Nelson did not evaluate Mr. Liles because "it would be unlikely that [he] would find anything from an actual discussion with him and a physical exam that would really enlighten [his] opinion, change anything." Instead, he reviewed Mr. Liles' medical and school records, including the evaluations and conclusions of Dr. Kraft and Dr. Blackwell-White.

Dr. Nelson pointed out that Mr. Liles' pediatrician had performed developmental screenings throughout his childhood, and had not identified any developmental problems or detected any health effect caused by exposure to lead, including any attention, learning, or behavior problems. There was no evidence in Mr. Liles' school record of academic difficulties due to cognitive impairment, and the only two occasions where Mr. Liles had academic difficulties were in fifth grade, when he was suffering from anxiety issues and absenteeism, and in high school, when he fractured his thumb on his dominant hand. Dr. Nelson noted that Mr. Liles performed well in school, i.e., at or above grade level, until fifth grade.

Dr. Nelson also reviewed Mr. Liles' standardized tests, including the PSATs, stating that "he did generally quite well and he did particularly well on his PSAT test." Mr. Liles' PSAT scores were impressive because Mr. Liles scored on or above the 50th percentile relative to other college bound students, and there was no indication that Mr. Liles had any accommodations or extra time to take the test.

In sum, Dr. Nelson concluded that Mr. Liles' lead exposure did not cause him "any issues at all," and he did not suffer from "any cognitive damage from any cause." He

opined that, if Mr. Liles had never been exposed to lead, he would not have been "any different whatsoever." Mr. Liles' academic performance did not reflect any difficulties due to his cognitive abilities, because poor performance due to cognitive deficits is consistent, not transient. In that regard, he stated:

> [I]f it's due to cognitive usually that's consistent. He's got ups and downs. And when I see a child . . . who is performing well now that didn't perform well before, now does better again, something's going on and it's probably not cognitive. Something is going on with him personally . . . emotionally. So I see this all the time. It's not an infrequent thing, but I see this kind of variability in students and they can do the work, but the question is why aren't they doing the work?"

B.

Scott Beveridge, Ph.D.

Scott Beveridge, Ph.D., is a vocational rehabilitation counselor who helps people with disabilities go back to work. Dr. Beveridge did a vocational evaluation on Mr. Liles "to determine if there was any impact on his ability to work and maintain competitive employment." Although the RAPEL methodology is the most peer reviewed methodology to determine vocational abilities, Dr. Beveridge used another methodology, PEEDS-RAPEL, which is appropriate to use on younger individuals. Dr. Beveridge determined Mr. Liles' likely pre-lead exposure capacity based on his parental and other family members' educational attainment and work history. After asking Mr. Liles which family members were important in his life, including role models and mentors, Dr. Beveridge evaluated each family member's education and vocational experience. He then applied the Specific Vocational Preparation ("SVP") rating scale to determine the training level

required for each family member's employment. The scale ranks the training requirements for each job, i.e., an SVP of "3" means the job requires 1-3 months of training, an SVP of "4" requires 3-6 months of training, and the highest, an SVP of "8," requires 4-10 years of training. Most of Mr. Liles' family members had an SVP of 3-4, with the exception of his brother, who was enrolled in a pre-med program, which is an SVP of 7-8.

After doing this evaluation, Dr. Beveridge determined that Mr. Liles, who expressed a career interest in medicine and nursing, has the capacity to obtain his Associate's Degree, but not likely a medical degree. He explained that Mr. Liles is "essentially an average person," when "looking at the testing." Most physicians have an above-average IQ.

To determine Mr. Liles' vocational capacity, Dr. Beveridge also reviewed the neuropsychological evaluations, and he performed his own IQ and Wide-Range Academic Achievement Tests, along with a Self-Directed Search, a test to determine the best major or job fit for high school and college students. The results of the testing were consistent with those obtained by Dr. Kraft; they showed average IQ and Academic Achievement Scores. The Self-Directed Search identified a personality fit with Mr. Liles' expressed field of interest, nursing. Dr. Beveridge also relied on the "two best predictors of if someone's going to do well in college," GPA and SAT (or, here, PSAT) scores. He opined that Mr. Liles can complete his Associate's degree and work as a nurse throughout his normal life, and Mr. Liles' likely educational and vocational capacity was the same as it was prior to his lead exposure.

IV.

Motions for Judgment

At the conclusion of Mr. Liles' case, Ivy Realty made a motion for judgment, arguing that the evidence presented by Mr. Liles fell "short of speculation," with regard to damages and causation of injury. With respect to causation of injury, counsel argued that Dr. Blackwell-White was the sole causation expert, and her testimony was based solely on epidemiological literature without any "identification of measurement for the individual to support her opinions that there has been cognitive loss caused by lead exposure." Counsel stated that Dr. Blackwell-White had no basis to say that Mr. Liles suffered a four-point IQ loss, noting that she conceded that this number was extrapolated from epidemiological literature, but not every child exposed to lead up to 10 mcg/dL loses four IQ points. Counsel argued that the evidence was insufficient to support a compensable injury, i.e., "an injury that was a measurable injury caused by the lead exposure that has caused damages."

Counsel for Mr. Liles responded that Dr. Kraft "clearly stated what the cognitive deficits and injuries are to Mr. Liles," i.e., he has deficits in auditory encoding, working memory, processing speed, and has an IQ in the range of 94 full-scale IQ." Dr. Blackwell-White "described what lead poisoning does and how it impedes a child's brain development," and Mr. Liles testified about "his problems with attention and focus and concentration through school."

In denying the motion, which the court characterized as arguing that Dr. Blackwell-White could not quantify the injury, the court stated:

> The testimony of the expert in giving her opinion is that there was injury, immeasurable based on those in terms of the studies that she studied and reviewed and that which is relied upon, and that review by her, as well as that which was relied upon by her of the other experts in the case itself.
>
> That, under the circumstances, the cognitive deficits are measurable and [] based on the information received that was reviewed by the witness as well as the studies as to the impact of lead and the correlation going back to the lead injury itself.
>
> Taking into consideration the facts and circumstances, that direct evidence and circumstantial evidence is to be taken into consideration by the jury, the motion is denied.

At the close of all evidence, Ivy Realty made another motion for judgment, arguing that the evidence was insufficient to prove both injury and damages. With respect to damages, counsel argued that neither Dr. Conte nor Mr. Lieberman offered an opinion of loss due to lead exposure, but rather, they offered opinions as to loss "due to everything in this young man's life that may have formulated his cognitive development." Counsel continued that the medical experts "never tied the bow," as they never offered any actual opinion that any deficits were evidence of brain injury. Furthermore, Dr. Blackwell-White did not testify or offer an opinion that Mr. Liles was injured because of lead, as there is nothing to support a conclusion that every child who is exposed to lead has a measurable injury. Indeed, Dr. Nelson testified that a conclusion cannot be drawn from epidemiological studies, which were relied on exclusively by Dr. Blackwell-White, that an individual was injured due to lead exposure. Counsel argued that other testimony, including that of Dr. Beveridge, indicated that "a proper way to measure whether or not there's been injury would be to evaluate the family," and if there is a "significant difference

between the functioning of the child and the functioning of the family, you can more reliably say that there's been injury due to the lead exposure to the child." In this case, counsel argued, there is no factual basis to support that Mr. Liles would be functioning any differently than he would have had he not been exposed to lead, which relates to both causation and damages.

Counsel for Mr. Liles argued that Dr. Kraft's testimony that Mr. Liles had cognitive deficits, which were not due to chance, coupled with Dr. Blackwell-White's testimony that those deficits were caused by lead, proved causation. With respect to damages, counsel argued that Mr. Lieberman's testimony regarding the difference between Mr. Liles' vocational marketability, both "as-is and . . . absent deficits," coupled with Dr. Conte's monetary value on the difference between the two -- $1,698,808 – was evidence of damages.

The court denied the motion. It stated that the issues presented, whether exposure to lead paint and elevated blood lead levels caused injury to Mr. Liles, and if so, what amount of damages should be awarded, were factual disputes.

STANDARD OF REVIEW

Maryland Rule 2-519 provides that "[a] party may move for judgment on any or all of the issues in any action at the close of the evidence offered by an opposing party, and in a jury trial at the close of all the evidence." The standard for reviewing a circuit court's ruling on a motion for judgment is well settled:

> [W]e ask whether on the evidence adduced, viewed in the light most favorable to the non-moving party, any reasonable trier of fact could find the

> elements of the tort by a preponderance of the evidence. . . . If there is even a slight amount of evidence that would support a finding by the trier of fact in favor of the plaintiff, the motion for judgment should be denied.

Asphalt & Concrete Services, Inc. v. Perry, 221 Md. App. 235, 271-72 (2015) (quoting *Washington Metro. Area Transit Auth. v. Djan*, 187 Md. App. 487, 491-92 (2009)), *aff'd on other grounds*, 447 Md. 31 (2016).

DISCUSSION

I.

Causation

Ivy Realty contends that the circuit court erred in denying its motion for judgment and submitting the case to the jury, arguing that Mr. Liles failed to produce sufficient evidence that his lead exposure caused any injury. They acknowledge that Dr. Blackwell-White testified that Mr. Liles suffered cognitive deficits as a result of exposure to lead, but they argue that this conclusion was not based on any epidemiological or other evidence that lead exposure "can cause, and therefore did cause, the deficits in auditory encoding and processing speed identified by Dr. Kraft." Ivy Realty further argues that there was insufficient evidence to support Dr. Blackwell-White's conclusion that Mr. Liles suffered a four-point IQ loss due to his lead exposure, asserting that there was no IQ loss diagnosed,

and an expert may not "rely upon the epidemiological literature to determine that an undiagnosed condition exists."[12]

Mr. Liles contends that he "produced sufficient evidence, via both neuropsychological and medical testimony, that he suffered permanent injury to his brain due to childhood lead exposure." He argues that the testimony of Dr. Blackwell-White showed that "his childhood lead exposure both can and did cause the cognitive deficits identified" by Dr. Kraft, asserting that Dr. Blackwell-White's opinion was based on numerous studies showing that lead exposure causes IQ loss and attention deficits, and the deficits that Dr. Kraft found were encompassed by "the umbrella term 'attention.'"

Dr. Blackwell-White testified that Mr. Liles' lead exposure caused injury. Specifically, she testified that the exposure to lead caused: (1) cognitive defects in processing speed and auditory encoding; and (2) a four-point loss in IQ.

As Ivy Realty notes, "[a]n expert's opinion testimony must be based on [an] adequate factual basis so that it does not amount to 'conjecture, speculation, or incompetent evidence.'" *Giant Food, Inc. v. Booker*, 152 Md. App. 166, 182-83, 90 (quoting *Uhlik v. Kopec*, 20 Md. App. 216, 223-24 (1974)), *cert. denied*, 378 Md. 614 (2003). In *Booker*, this Court held that, where proof of causation relied on expert testimony, and that expert testimony lacked a sufficient factual basis to support the expert's conclusions, the circuit court erred in denying the defendant's motions for judgment and judgment notwithstanding

[12] We note that Ivy Realty did not challenge the methodology of the epidemiological studies on which Dr. Blackwell-White relied.

the verdict. *Id.* at 189-90. The issue before us, therefore, is whether Dr. Blackwell-White had a sufficient factual basis to support her conclusions. If so, then the circuit court properly submitted the issue of causation to the jury.[13]

Here, Dr. Blackwell-White testified that the EPA-ISA and other studies showed that there is a causal relationship between childhood lead exposure and cognitive IQ loss and problems of attention. Based on these studies, and her review of Mr. Liles' medical records and evaluations, she concluded that Mr. Liles' lead exposure caused the cognitive deficits identified by Dr. Kraft and a loss of four IQ points.

In *Rochkind v. Stevenson*, 454 Md. 277, 288 (2017), the Court of Appeals stated that it had not decided "the extent to which epidemiological studies can support expert testimony on causation." The Court noted that other jurisdictions had held that epidemiological studies cannot support expert testimony on causation if they do not show a causal link between a chemical agent and a particular injury, but instead show only a connection or association. *Id.* at 288-91. *See General Electric Co. v. Joiner* 522 U.S. 136, 152-53 (1997) (epidemiological studies concluding that polychlorinated biphenyls (PCB's) can cause lung cancer could not support the expert testimony because none of the studies had found a causal link between PCB's and cancer); *Mitchell v. Gencorp Inc.*, 165 F.3d. 778, 782 (10th Cir. 1999) (expert testimony suffered from "'an analytical gap'" when

[13] Ivy Realty does not challenge on appeal the circuit court's ruling admitting Dr. Blackwell-White's testimony.

studies only supported a connection between the chemical agent and the plaintiff's leukemia, not a causal relationship) (quoting *Joiner*, 522 U.S. at 146).

In *Stevenson*, the medical expert, Dr. Cecilia Hall-Carrington, relied on the EPA-ISA's finding that there was "a causal relationship between [lead] exposure and attention decrements, impulsivity, and hyperactivity in children." *Id.* at 288. Dr. Hall-Carrington testified that the plaintiff's lead exposure was a "'significant contributing factor' to [Ms. Stevenson's] neurological problems, including her ADHD." *Id.* at 282.

The Court of Appeals held that "Dr. Hall-Carrington did not provide a sufficient factual foundation for why she thought the EPA-ISA supported her conclusion that lead exposure can cause ADHD," stating that the "studies described in the EPA-ISA finding a causal relationship between lead exposure and attention deficits and hyperactivity do not go that far." *Id.* at 290. The Court noted that the American Psychiatric Association's *Diagnostic and Statistical Manual of Mental Disorders* (the "DSM-V") lists several specific criteria for an ADHD diagnosis, and "Dr. Hall-Carrington did not provide any information on this diagnostic criteria or otherwise differentiate between general attention deficits and a clinical ADHD diagnosis." *Id.* The Court explained:

> Although research shows that lead exposure can cause general attention deficits and hyperactivity, these lead-caused behaviors do not necessarily indicate that an individual has ADHD because these behaviors are also symptoms of a variety of other disorders and learning disabilities. Indeed, the DSM-V instructs clinicians to rule out several other behavioral disorders with similar symptoms before diagnosing a child with ADHD. Clearly, general attention deficits and ADHD are not one and the same.
>
> ***

> In equating attention deficits and hyperactivity with a clinical ADHD diagnosis, Dr. Hall-Carrington painted an inaccurate picture of the scientific research regarding lead poisoning – she overstated the known effects of lead exposure. Her testimony suffers from the same "analytical gap" described in *Joiner*.

Id. at 290-91 (citations omitted).

Ivy Realty argues that there is a similar "analytical gap" here because, although the EPA-ISA describes a causal relationship between lead exposure and "attention decrements," it does not show that lead causes the cognitive deficits identified by Dr. Kraft, impairments in processing speed and auditory encoding. Dr. Kraft, however, testified that both auditory encoding of information in the working memory and informational processing speed are "factors of attention." Dr. Blackwell-White similarly testified that these deficits were "measures of attention" and were part of the "umbrella term 'attention'" used in the EPA-ISA. Thus, unlike in *Stevenson*, where the studies did not support a causal relationship between lead and the specific diagnosis of ADHD, the studies here did show a causal link between Mr. Liles' lead exposure and his attention deficits. Accordingly, there was not an "analytical gap" between the data and Dr. Blackwell-White's ultimate opinion that lead exposure caused Mr. Liles' attention deficits.

Other courts have recognized that epidemiological studies are an accepted source to demonstrate a causal relation between a chemical and an injury. *See Rains v. PPG Indus., Inc.*, 361 F. Supp. 2d 829, 834 (D. Ill. 2004) ("Epidemiologic studies are the primary, generally accepted methodology for demonstrating a causal relation between a chemical and the set of symptoms or a disease."); *Castellow v. Chevron USA*, 97 F. Supp. 2d 780,

786 (S.D. Tex. 2000) ("It is accepted that, in evaluating a purported causal link between a chemical agent and a particular disease, epidemiological studies are the most informative.").

We hold that, based on the epidemiological studies showing a causal relationship between childhood lead exposure and problems with attention, and Mr. Liles' medical and neuropsychological records, there was a sufficient factual basis for Dr. Blackwell-White's opinion that the cognitive deficits identified by Dr. Kraft, impairments that fall within the umbrella term "attention," were caused by Mr. Liles' lead exposure. Although Ivy Realty's experts testified differently, the circuit court properly determined that the weight and credibility of this evidence was an issue for the jury to resolve.

We turn next to Dr. Blackwell-White's opinion that Mr. Liles' lead exposure caused a loss of four IQ points. In support of that conclusion, Dr. Blackwell-White relied upon the Lanphear Study, which found a range of two to five IQ points lost based on lead levels up to 10 mcg/dL.

As Mr. Liles notes, the Maryland appellate courts have upheld the use of the Lanphear Study as the basis for calculating IQ loss for plaintiffs in lead paint cases. In *Rochkind v. Stevenson*, 229 Md. App. 422, 469 (2016), *rev'd on other grounds*, 454 Md. 277 (2017), this Court stated:

> Because, as Mr. Rochkind acknowledges, there is a scientific consensus that lead poisoning causes IQ loss, the only issue is whether the trial court abused its discretion by allowing Dr. Hall-Carrington to opine that Ms. Stevenson sustained a specific IQ loss of between five and six points. Dr. Hall-Carrington formed her opinion by extrapolating from epidemiological studies quantifying IQ loss resulting from lead exposure in

> the general population to estimate the range of IQ loss in an individual. The court accepted this methodology as sound. This was not an abuse of discretion.

More recently, the Court of Appeals held that there was a sufficient factual basis for expert opinion, based on the Lanphear Study, that lead exposure caused the plaintiff a loss of 7.4 to 9.4 IQ points. *Levitas v. Christian*, 454 Md. 233, 240, 247-48 (2017). Similarly, here, Dr. Blackwell-White's opinion, based on the Lanphear Study, had a sufficient factual basis.

Dr. Blackwell-White's testimony satisfied Mr. Liles' burden of providing evidence, which the jury could accept or reject, that Mr. Liles' lead exposure caused cognitive deficits. Accordingly, Ivy Realty's claim, that the circuit court erred in denying the motions for judgment and judgment notwithstanding the verdict because Mr. Liles failed to show lead exposure caused injury, is without merit.

II.

Damages

Ivy Realty next contends that the circuit court erred in submitting the case to the jury because, even if Mr. Liles produced sufficient evidence to show that lead exposure

caused injury, he failed to produce sufficient evidence that he incurred damages. Specifically, they contend that there was insufficient evidence of loss of earning capacity.[14]

Mr. Liles contends that he produced sufficient evidence of damages. He points to Mr. Lieberman's testimony that, although Mr. Liles' IQ indicated that he would be able to earn an Associate's Degree, due to his attention deficits, Mr. Liles would not be able to achieve that goal. Mr. Liles asserts that this opinion "was based on a sound methodology and had a solid factual basis."

Ivy Realty is correct that "compensatory damages are not to be awarded in negligence . . . actions absent evidence that the plaintiff suffered a loss or detriment." *Owens-Illinois v. Armstrong*, 87 Md. App. 699, 735 (1991), *aff'd in part, rev'd in part on other grounds*, 326 Md. 107 (1992). Here, the loss claimed is an impairment of earning capacity. In that regard, this Court has explained that the proper measure in determining damages for impairment of earning capacity "is the difference between the amount that the plaintiff was capable of earning before his injury and that which he is capable of earning," i.e., the plaintiff essentially "'must establish the disparity between the market value of his

[14] Although Ivy Realty asserts that there was insufficient evidence that Mr. Liles incurred any injury "that caused any functional change upon which a jury could determine non-economic or economic damages beyond speculation," the argument presented is limited to a failure to show economic damages of "change in vocational capacity and loss of earning capacity resulting from his lead exposure." Because Ivy Realty limited its argument to economic damages, we will confine our analysis to that issue as well. *See Assateague Coastkeeper v. Md. Dep't of the Env't*, 200 Md. App. 665, 670 n.4 (2011) (Where appellants failed to present any argument on an issue "we will not address it."), *cert. denied*, 424 Md. 291 (2012); *Honeycutt v. Honeycutt*, 150 Md. App. 604, 618 (refusing to address argument because appellants failed to adequately brief the argument), *cert. denied*, 376 Md. 544 (2003).

services before and after the injury.'" *Lewin Realty III, Inc. v. Brooks*, 138 Md. App. 244, 281 (2001) (quoting *Anderson v. Litzenberg*, 115 Md. App. 549, 573 (1997)), *aff'd on other grounds*, 379 Md. 70 (2003), and *abrogated on other grounds* by *Ruffin Home Corp. of Maryland, Inc. v. Gasper*, 418 Md. 594 (2011).

Here, Mr. Lieberman testified that, without deficits, i.e., without the problems caused by lead exposure, Mr. Liles would have been able to obtain an Associate's Degree, and with deficits, which Mr. Lieberman described as "major cognitive issues," Mr. Liles would have the earning potential of an individual with a high school diploma and "some college." In making that determination, Mr. Lieberman employed the primary methodology used in the field of vocational rehabilitation counseling.

Dr. Conte testified that, based on Mr. Lieberman's assessment, Mr. Liles suffered a loss of earnings of $1,698,808. That number represented the difference between the average wages for individuals with the educational attainment of an Associate's degree (earning potential absent injury), i.e., $3,456,127, and the average wages of individuals with the educational attainment of high school plus some college (earning potential with cognitive deficits), i.e., $1,757,320.

This evidence was sufficient to present the issue of damages to the jury. Ivy Realty argues that the opinions were insufficient because: (1) Dr. Lieberman should have used a different methodology to assess Mr. Liles and considered his parents' educational and vocational attainment; and (2) Dr. Conte gave "confusing" testimony in response to a question on cross-examination. Those arguments, however, go to the weight of the

evidence, an issue to be assessed by the jury. The circuit court properly denied Ivy Realty's motions for judgment and submitted the case to the jury.

JUDGMENT OF THE CIRCUIT COURT FOR BALTIMORE CITY AFFIRMED. COSTS TO BE PAID BY APPELLANT.