Rosa Gonzales and Javier Rojas, individually and as parents and next friends of Joaquin Rojas, a minor, appellants, v. Nebraska Pediatric Practice, Inc., et al., appellees.

___ N.W.2d ___

Filed January 29, 2019. No. A-17-350.

1. **Expert Witnesses: Appeal and Error.** Abuse of discretion is the proper standard of review of a district court's evidentiary ruling on the admission of expert testimony under *Daubert v. Merrell Dow Pharmaceuticals, Inc.*, 509 U.S. 579, 113 S. Ct. 2786, 125 L. Ed. 2d 469 (1993).
2. **Judges: Words and Phrases.** A judicial abuse of discretion exists when a judge, within the effective limits of authorized judicial power, elects to act or refrain from acting, but the selected option results in a decision which is untenable and unfairly deprives a litigant of a substantial right or a just result in matters submitted for disposition through a judicial system.
3. **Trial: Evidence: Appeal and Error.** To constitute reversible error in a civil case, the admission or exclusion of evidence must unfairly prejudice a substantial right of a litigant complaining about evidence admitted or excluded.
4. **Evidence: Expert Witnesses.** Expert medical testimony must be based on a reasonable degree of medical certainty or a reasonable probability.
5. **Trial: Expert Witnesses.** An objection to the opinion of an expert based upon the lack of certainty in the opinion is an objection based upon relevance.
6. **Evidence: Words and Phrases.** Relevant evidence means evidence having any tendency to make the existence of any fact that is of consequence to the determination of the action more or less probable than it would be without the evidence.
7. **Expert Witnesses: Physicians and Surgeons: Words and Phrases.** "Magic words" indicating that an expert's opinion is based on a reasonable degree of medical certainty or probability are not necessary.

8. **Expert Witnesses: Words and Phrases.** An expert opinion is to be judged in view of the entirety of the expert's opinion and is not validated or invalidated solely on the basis of the presence or lack of the magic words "reasonable medical certainty."
9. **Expert Witnesses: Physicians and Surgeons.** The requirement that expert medical testimony be based on a reasonable degree of medical certainty or reasonable probability requires that causation testimony move beyond a mere loss of chance—or a diminished likelihood of achieving a more favorable medical outcome.
10. ____: ____. Loss of chance, in Nebraska, is insufficient to establish causation.
11. **Trial: Expert Witnesses.** Whether a witness is qualified as an expert is a preliminary question for the trial court.
12. **Courts: Expert Witnesses.** Under the evaluation of expert opinion testimony, the trial court acts as a gatekeeper to ensure the evidentiary relevance and reliability of an expert's opinion.
13. **Trial: Expert Witnesses: Intent.** The purpose of the gatekeeping function is to ensure that the courtroom door remains closed to "junk science" that might unduly influence the jury, while admitting reliable expert testimony that will assist the trier of fact.
14. **Trial: Expert Witnesses.** Before admitting expert opinion testimony, the trial court must (1) determine whether the expert's knowledge, skill, experience, training, and education qualify the witness as an expert; (2) if an expert's opinion involves scientific or specialized knowledge, determine whether the reasoning or methodology underlying the testimony is valid; (3) determine whether that reasoning or methodology can be properly applied to the facts in issue; and (4) determine whether the expert evidence and the opinions related thereto are more probative than prejudicial.
15. **Trial: Expert Witnesses: Pretrial Procedure.** A challenge under *Daubert v. Merrell Dow Pharmaceuticals, Inc.*, 509 U.S. 579, 113 S. Ct. 2786, 125 L. Ed. 2d 469 (1993), and *Schafersman v. Agland Coop*, 262 Neb. 215, 631 N.W.2d 862 (2001), should take the form of a concise pretrial motion and should identify which of these factors—the expert's qualification, the validity/reliability of the expert's reasoning or methodology, the application of the reasoning or methodology to the facts, and/or the probative or prejudicial nature of the testimony—is believed to be lacking.
16. **Trial: Expert Witnesses: Physicians and Surgeons.** Testimony of qualified medical doctors cannot be excluded simply because they are not specialists in a particular school of medical practice.
17. **Rules of Evidence: Expert Witnesses.** Whether a witness is an expert under Neb. Rev. Stat. § 27-702 (Reissue 2016) depends on the factual

basis or reality behind a witness' title or underlying a witness' claim to expertise.

18. **Trial: Expert Witnesses.** Experts or skilled witnesses will be considered qualified if, and only if, they possess special skill or knowledge respecting the subject matter involved so superior to that of persons in general as to make the expert's formation of a judgment a fact of probative value.
19. **Appeal and Error.** An appellate court may, at its discretion, discuss issues unnecessary to the disposition of an appeal where those issues are likely to recur during further proceedings.
20. **Trial: Expert Witnesses.** A trial court, when faced with an objection under *Daubert v. Merrell Dow Pharmaceuticals, Inc.*, 509 U.S. 579, 113 S. Ct. 2786, 125 L. Ed. 2d 469 (1993), and *Schafersman v. Agland Coop*, 262 Neb. 215, 631 N.W.2d 862 (2001), must adequately demonstrate by specific findings on the record that it has performed its duty as gatekeeper.
21. **Trial: Expert Witnesses: Records: Appeal and Error.** After an objection under *Daubert v. Merrell Dow Pharmaceuticals, Inc.*, 509 U.S. 579, 113 S. Ct. 2786, 125 L. Ed. 2d 469 (1993), and *Schafersman v. Agland Coop*, 262 Neb. 215, 631 N.W.2d 862 (2001), has been made, the losing party is entitled to know that the trial court has engaged in the heavy cognitive burden of determining whether the challenged testimony was relevant and reliable, as well as a record that allows for meaningful appellate review.
22. **Trial: Expert Witnesses: Appeal and Error.** Without specific findings or discussion on the record, it is impossible to determine whether the trial court carefully and meticulously reviewed the proffered scientific evidence or simply made an off-the-cuff decision to admit expert testimony. The trial court must explain its choices so that the appellate court has an adequate basis to determine whether the analytical path taken by the trial court was within the range of reasonable methods for distinguishing reliable expert testimony from false expertise.

Appeal from the District Court for Douglas County: JAMES T. GLEASON, Judge. Affirmed in part, and in part reversed and remanded for further proceedings.

Greg Garland, of Greg Garland Law, Tara DeCamp, of DeCamp Law, P.C., L.L.O., and Kathy Pate Knickrehm for appellants.

Patrick G. Vipond, Sarah M. Dempsey, and William R. Settles, of Lamson, Dugan & Murray, L.L.P., for appellees.

Riedmann, Bishop, and Welch, Judges.

Welch, Judge.

I. INTRODUCTION

Rosa Gonzales and Javier Rojas (Appellants), individually and as parents and next friends of Joaquin Rojas, appeal the district court's order denying the motion to admit expert testimony filed by Appellants and granting the motion to strike expert testimony filed by Nebraska Pediatric Practice, Inc.; Corey S. Joekel, M.D.; and Children's Hospital and Medical Center (Children's) (collectively Appellees). Appellants also appeal the district court's order granting Appellees' motion for summary judgment. For the reasons set forth herein, we affirm in part, and in part reverse and remand for further proceedings consistent with this opinion.

II. STATEMENT OF FACTS

1. Appellants' Complaint

In August 2014, Appellants sued Appellees for malpractice or professional negligence under Neb. Rev. Stat. § 44-2822 (Reissue 2010). Specifically, Appellants allege Rosa brought her son Joaquin to the emergency department at Children's on August 5, 2012, with symptoms consistent with mononucleosis, which is also known as the Epstein-Barr virus (EBV). The examining physician diagnosed Joaquin with mononucleosis and discharged him. On August 7, Rosa brought Joaquin back to the emergency department at Children's because Joaquin's symptoms were not improving and some of his symptoms seemed to be getting worse. Appellants allege that at that time, some of Joaquin's symptoms were consistent with mononucleosis and EBV meningoencephalitis. Encephalitis is an inflammation of the brain, and meningitis is an inflammation of the protective membranes covering the brain. Dr. Joekel, the treating emergency department physician, diagnosed Joaquin with mononucleosis and discharged him.

Three and a half hours after being discharged, Joaquin had a seizure requiring fire department emergency personnel to

transport him from his home to the University of Nebraska Medical Center (UNMC) emergency department, where he was subsequently admitted. During the seizure, medical personnel administered antiepileptic drugs and performed a tracheostomy due to a lack of oxygen during the seizure. At UNMC, Joaquin was diagnosed with EBV meningoencephalitis, which is a combination of encephalitis and meningitis, and on August 10, 2012, Joaquin underwent a decompressive craniectomy to remove sections of his skull to relieve pressure on his brain. About a month later, Joaquin underwent a cranioplasty to replace the skull sections. Joaquin was discharged from UNMC to a rehabilitation hospital, where he spent about a month receiving physical and speech therapy. Appellants allege that since returning home, Joaquin has displayed effects of brain injury caused by the August 7 seizure, including learning deficits and placement in special education classes. Appellants' complaint alleges Dr. Joekel was professionally negligent in failing to diagnose Joaquin's EBV meningoencephalitis and failing to admit Joaquin to Children's for further supportive treatment and evaluation. On the dates at issue, Dr. Joekel was a pediatric emergency department physician employed with Nebraska Pediatric Practice, which had a contract with Children's to provide emergency department services at its facility.

2. Pretrial Motions

In February 2017, Appellants filed a motion under Neb. Rev. Stat. § 27-104 (Reissue 2016) to qualify Dr. Todd Lawrence as an expert witness on all elements of proof required for this medical malpractice claim, including standard of care, breach, causation, and damages. Appellees filed a motion to strike Dr. Lawrence as an expert witness, arguing that his proposed causation testimony amounted to speculative loss-of-chance testimony and was inadmissible under the requirements of *Daubert v. Merrell Dow Pharmaceuticals, Inc.*, 509 U.S. 579, 113 S. Ct. 2786, 125 L. Ed. 2d 469 (1993), and *Schafersman v. Agland Coop*, 262 Neb. 215, 631 N.W.2d 862

(2001) (*Daubert*/*Schafersman*). Appellees also filed a motion for summary judgment on the issue of causation, asserting Appellants could not prove causation and had not presented any evidence that Joaquin's outcome would have been different if he had been admitted to Children's and treated on August 7, 2012, rather than being discharged.

During a hearing on the motions, the court first heard argument and received exhibits on Appellants' motion to qualify their expert and Appellees' motion to strike Appellants' expert. Appellants offered the following exhibits which were received without objection: Dr. Lawrence's curriculum vitae, Appellants' designation of Dr. Lawrence as an expert witness, Dr. Lawrence's deposition, and Dr. Joekel's deposition. Appellees offered Dr. Ivan Pavkovic's deposition, Dr. Pavkovic's affidavit, Dr. Archana Chatterjee's affidavit, and various published medical literature explaining EBV, encephalitis, meningitis, and seizures. Appellants objected to Appellees' exhibits, with the exception of the deposition of Dr. Pavkovic. Specifically, Appellants' counsel stated:

> [Counsel]: . . . We object to [the affidavits of Drs. Pavkovic and Chatterjee] on 402, 403, 702, Schafersman 1 and 2, Kuhmo Tire, and . . . the reason for [the objections to the affidavits of Drs. Pavkovic and Chatterjee] —
>
> THE COURT: . . . [I]f you have an objection, make it. . . . I don't need argument.
>
> [Counsel]: Those are the numbers. And on [the published medical literature], we object on 402, 403 and 803.17. As there's been no showing that those are reliable documents by any medical witness since they're going to be used in a dispositive motion . . . .
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> . . . .
>
> [Counsel]: . . . Would the court entertain a comment on [the objections to the affidavits of Drs. Pavkovic and Chatterjee]?
>
> THE COURT: No. For the purposes of this hearing, the exhibits will be received.

After discussion on the motions concerning Dr. Lawrence's testimony, the court then moved to the motion for summary judgment and asked for argument and additional exhibits other than what had already been received. Neither party offered any additional exhibits. Appellees noted that the motion for summary judgment turned on the question of whether Dr. Lawrence's testimony on causation would be permitted. Appellees argued that Dr. Pavkovic indicated, in his opinion, that nothing could have been done to prevent the outcome in this case and that without Dr. Lawrence's testimony, Appellants have no causation opinion. Appellants conceded Appellees' argument and stated: "If you determine that we don't have causation, then [Appellees' motion for summary judgment] needs to be granted."

3. Exhibits Received During Hearing

(a) "Designation" of Dr. Lawrence

Appellants' "[d]esignation" of Dr. Lawrence provided that Dr. Lawrence specialized in family and emergency medicine. The designation indicated that, in preparation for this case, Dr. Lawrence reviewed Joaquin's medical records from a health clinic, the fire department transport, Children's, UNMC, and an eye consultant, as well as the complaint, answers, and depositions in this case. The designation listed various methodologies which Dr. Lawrence used in his analysis, including the "Case Study Method," the "SOAP Process," the "Differential Diagnosis Method," and the "Differential Etiology Method."

The designation offered Dr. Lawrence's opinion that Dr. Joekel was required by the applicable standard of care to properly monitor, treat, and diagnose Joaquin during his emergency department visit to Children's on August 7, 2012, including putting EBV encephalitis and meningitis on the differential diagnosis; ordering laboratory work, including a complete blood count test, a white blood count test, a C-reactive protein test, and a urine test; ordering a lumbar puncture; diagnosing

and treating EBV encephalitis or meningitis; ordering intravenous (IV) fluids, IV antivirals, and aggressive fever medications; and admitting Joaquin to the hospital to provide supportive care, treatment, and monitoring, including, but not limited to, providing care, treatment, and monitoring of Joaquin's EBV meningoencephalitis. The designation provided Dr. Lawrence's opinion that Dr. Joekel breached this standard of care in failing to perform these functions and that this failure directly caused Joaquin's injuries.

(b) Dr. Lawrence's Deposition

In Dr. Lawrence's deposition, he testified he has been employed with a medical center in Waterloo, Iowa, since 2003, where he has served as a medical director and staff physician for the emergency department. Dr. Lawrence is board certified in family practice, but he is not board certified in pediatrics, pediatric neurology, or pediatric infectious disease. Although he serves as an administrator, the majority of his time was spent working as an emergency department physician. In this role, Dr. Lawrence testified that 30 to 40 percent of his patients are pediatric patients; he treats an average of two patients per month with mononucleosis; and of those individuals, he has performed probably four to five total spinal taps and hospitalized an average of two or three of the diagnosed patients each year. Although he has not diagnosed a patient with EBV encephalitis or meningitis, he has treated patients with viral meningitis. As to seizures and their link to brain injury, Dr. Lawrence testified that he has "seen plenty of patients in [his] career with brain injuries related to seizures not related to infections."

Dr. Lawrence testified he was not sure when Joaquin's mononucleosis turned into EBV meningoencephalitis, but that he believes Joaquin had EBV meningoencephalitis when he was treated by Dr. Joekel on August 7, 2012. In general, Dr. Lawrence provided that the treatment for EBV meningoencephalitis "is supportive care typically, so IV fluids, aggressive fever medications, [and] aggressive hydration." He

testified that hospitalization is appropriate if a patient with mononucleosis is "quite ill, not able to keep their fever under control, [and] not able to eat or drink appropriately." He testified that "along with the constellation of other symptoms, the decision to admit a patient, you take all of what's going on and how the child is responding and make a determination if they're sick enough where they need to be admitted or not. It's a clinical judgment."

Dr. Lawrence testified to areas in which he believes Dr. Joekel deviated from the standard of care; specifically, he testified that Dr. Joekel should have had encephalitis and meningitis higher on his differential diagnosis and performed further tests to rule them out, including a complete blood count test, a white blood count test, a C-reactive protein test, and a lumbar puncture. Dr. Lawrence testified the results of these tests would have indicated a need to hospitalize Joaquin. He also testified that Dr. Joekel should have started Joaquin on IV fluids to ensure hydration. He said that once Joaquin was hospitalized, Joaquin should have received IV fluids, IV antibiotics, and IV acyclovir (which is an antiviral medication), as well as received more monitoring and management of his fever through more aggressive fever medications. These treatments, Dr. Lawrence acknowledged, would not have addressed the EBV infection directly, but instead would have addressed some of the EBV symptoms to assist Joaquin's body in fighting the infection itself. Dr. Lawrence indicated that hydration, both orally and through IV fluids, assists the patient's body in addressing the symptoms of EBV and, perhaps, in fighting the virus itself. As such, Dr. Lawrence testified that doing so may have reduced Joaquin's fever and the risk of seizure. As to acyclovir, Dr. Lawrence provided: "[W]hile it is not a specific treatment for [suspected mononucleosis that has turned into encephalitis,]" there are "some anecdotal studies that it does help and helps reduce the shedding of the virus." However, Dr. Lawrence acknowledged acyclovir is typically "more for the herpes viral type" and "no studied evidence . . . proves"

that acyclovir can treat EBV or prevent its further progression. Dr. Lawrence testified that if he had a child present with viral meningitis, he would "start them an IV of acyclovir with the hopes [that it would] decrease the viral shedding." As to the fever monitoring and medicating, Dr. Lawrence opined that the hospital would have monitored Joaquin's fever and would have better managed it by "giving him Tylenol and/or ibuprofen."

Dr. Lawrence opined that Joaquin's lack of treatment and hospitalization contributed to his injuries, claiming that Joaquin's brain injury was caused by both the EBV meningoencephalitis and the seizure. Dr. Lawrence provided that the seizure contributed to Joaquin's brain injury in two possible ways, or in some combination thereof: First, the length and severity of the seizure could have, itself, resulted in brain injury. Second, the lack of oxygen caused by the seizure could have resulted in brain injury. Although he could not specifically attribute what percentage of Joaquin's brain injury was caused by the EBV meningoencephalitis and what percentage was caused by the failure to control Joaquin's seizure, he stated that the seizure, through these pathways and in combination with the EBV meningoencephalitis, resulted in brain swelling which, in turn, resulted in brain injury. When asked whether the seizure or the EBV meningoencephalitis was more responsible for the brain injury, Dr. Lawrence stated:

> I'd have to defer that off to your pediatric neurologist that you referenced. But I think . . . clearly, it was both.
>
> And to give a number on there, I don't know how you could assign a number. But I've seen plenty of patients in my career with brain injuries related to seizures not related to infections.

Dr. Lawrence opined that if Joaquin was adequately treated, his fever and hydration would have improved, which would have helped his body fight the infection which caused the brain injury. Dr. Lawrence specifically testified that "it may have decreased his chance of actually developing the encephalitis that triggered the seizure" or reduced or prevented the

seizure. Specifically, he addressed how taking steps to hospitalize, treat, and monitor Joaquin would have diminished the seizure, stating:

> My opinion is that had they identified the meningitis, encephalitis sooner, he would have been admitted to the hospital. He may or may not have had the seizure. Had he had the seizure, it would have been not as severe because he was in the hospital. And they could have used abortive seizure, epileptic medicines sooner.
>
> And then his outcome would have been not as severe requiring all the constellation of problems that he's had following that, between the craniotomy, the surgeries, the G-tube, the tracheostomy, the long hospitalization, the admission to the rehab unit, et cetera.

Dr. Lawrence further explained the seizure would have been better managed and possibly prevented if Joaquin had been in the hospital, because his hospitalization would have allowed for the management of his fever and hydration, use of antiepileptic drugs, and the ability to address his deficiency in oxygen as it arose. Dr. Lawrence stated that Joaquin "would have had a decreased length of hypoxia, decreased length of the seizure, and would have had a better outcome, which, with the reasonable degree of certainty, [Joaquin would then] not have had the craniotomy and all the procedures that followed that."

Responding to a question of whether a pediatric neurologist or a pediatric infectious disease expert would have much more knowledge concerning the effect of hydration and fever medication on preventing seizures, Dr. Lawrence agreed. However, Dr. Lawrence explained:

> I never said [the seizure could have been totally prevented]. I said his chance of seizure would have been less. I can't give you the number, . . . and, yes, a pediatric neurologist or pediatric [infectious disease] person would be able to better tell you that.
>
> But my opinion is that [Joaquin's] chance of having a seizure would have been less. The seizure caused hypoxia

> . . . which could have caused some of the brain damage also.

(c) Dr. Joekel's Deposition

In Dr. Joekel's deposition, he testified concerning his treatment of Joaquin on August 7, 2012. Specifically, he opined:

> It was a tragic outcome, a very rare complication of a fairly common viral infection that we see in children. At the time I saw Joaquin, he didn't have clinical signs or symptoms of meningitis or encephalitis, and despite my meeting the standard of care and providing expert care, sometimes there [are] bad outcomes and I feel bad about that for them.

Dr. Joekel additionally addressed Joaquin's seizure, possible treatment, and its effect on brain swelling. On treatment of seizures generally, Dr. Joekel provided:

> If [a patient that had similar symptoms to Joaquin] was currently having a seizure, we would evaluate to determine if it was a seizure. . . . If we determine that it is indeed a seizure and we want to stop it, then we have many medications that we would or could give. I mean, it depends on the individual patient.

On having a seizure at home or at the hospital, Dr. Joekel responded to questioning:

> Q. Would you prefer a patient if they're going to have a seizure to have it in the hospital or at home?
>
> . . . .
>
> A. That's a question I can't answer. It depends on the seizure. It depends on the patient. It depends on the circumstances. There are some very well-qualified families that take care of seizures in their kids at home all the time.
>
> Q. . . . All right. But for the most part, wouldn't it be better to have the patient in the hands of trained professionals who have access to medicines and machines who can help treat them better?

. . . .
A. Yes.

With respect to whether the seizure could have caused the need for the decompressive craniotomy or resulting brain injury, Dr. Joekel stated: "Seizures typically don't cause brain swelling or injuries like that," but he admitted that he would typically defer to a neurologist or a neurosurgeon on such a question.

(d) Dr. Pavkovic's Deposition

In Dr. Pavkovic's deposition, he testified that he is employed by "Children's Specialty Physicians, which is the academic practice at Children's," and is board certified in sleep medicine, epilepsy, and neurology, with special qualifications in pediatric neurology. Dr. Pavkovic was Joaquin's pediatric neurologist, beginning August 7, 2012, after Joaquin experienced his seizure. At that point, Dr. Pavkovic first noted that the seizure was likely a result of an infectious or inflammatory cause and later confirmed that it was a result of Joaquin's EBV meningoencephalitis. Dr. Pavkovic diagnosed Joaquin with "mild static encephalopathy"—a mild, unchanging "brain disorder"—and continued treatment of Joaquin with his last visit occurring in September 2015. Dr. Pavkovic testified regarding various conditions he observed in Joaquin and whether they were a result of brain injury suffered as a result of Joaquin's EBV meningoencephalitis. He testified that although brain injury occurs due to EBV meningoencephalitis, it is unclear how the injury occurs. Specifically, Dr. Pavkovic stated, "There may be a direct effect of the virus to actually kill brain cells or it may be an immune response to the virus, but something about that virus's presence is what leads to the brain injury."

Regarding Joaquin's brain swelling, the subsequent need for a craniotomy, and the possibility of a brain injury, Dr. Pavkovic testified: "[T]here's no preventative treatment that I know of [to treat patients with EBV encephalitis in a way to prevent the brain from swelling to the point where the patient would need a craniotomy]." He further explained:

> The brain swelling is a manifestation of the brain injury. I guess the analogy would be you . . . bump your knee and then the joint wells up kind of a thing. So it's a similar phenomenon. The injury — the cell death is there and then there's swelling as a consequence of that.
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> Q. . . . So does the swelling occur after the brain is injured?
>
> A. Yes.

Dr. Pavkovic also testified concerning Joaquin's seizure and stated that he has not "treat[ed] patients who have EBV encephalitis but who have not had a seizure," because "[t]here is no treatment for EBV encephalitis." Dr. Pavkovic testified that he did not know how long Joaquin had EBV meningoencephalitis prior to the seizure and that it was "probably unknowable." He further testified that although Joaquin is at an increased risk for future seizures due to his condition, he does not receive continuing treatment for seizures because there is no such treatment and he will receive treatment for any future seizures as they occur.

(e) Dr. Pavkovic's Affidavit

In Dr. Pavkovic's affidavit, he provided further opinion on the issue of causation of Joaquin's injuries, stating:

> 6. Based upon my treatment of Joaquin . . . , my review of his medical records, and my education, training, and experience, it is my opinion, to a reasonable degree of medical certainty, that even if Dr. . . . Joekel had hospitalized Joaquin . . . on August 7, 2012, there is nothing that could have been done to prevent Joaquin's mononucleosis infection from spreading to his brain and developing into [EBV] encephalitis. Treating Joaquin's fever and providing Joaquin with fluids and antibiotics would not have stopped the progression of the infection. There is also no evidence that providing this treatment would have prevented Joaquin from having a seizure or reduced his chance of having a seizure.

7. Although the medication acyclovir can be given to patients suffering from EBV encephalitis, there is no medical proof that it works to stop the progression of this illness. There is no treatment for EBV encephalitis. There is also no scientific evidence supporting the notion that giving Joaquin acyclovir would have prevented his seizure.

8. Joaquin suffered mild brain damage as a result of the EBV encephalitis. There is no evidence that the seizure Joaquin suffered contributed to any brain injury. Even if Joaquin had been hospitalized at the time he had the seizure, it would not have changed the outcome. There is nothing that Dr. Joekel or any other physician could have done to improve Joaquin's outcome. Joaquin's brain damage is due to the EBV encephalitis and was not caused by any delay in treatment.

(f) Dr. Chatterjee's Affidavit

In Dr. Chatterjee's affidavit, she testified she is a pediatric infectious disease physician who is board certified in general pediatrics and pediatric infectious disease and serves as a professor and "the Chair of the Department of Pediatrics at the University of South Dakota Sanford School of Medicine." Dr. Chatterjee provided her opinion regarding causation of Joaquin's medical conditions, stating:

6. Based on my review of Joaquin's medical records, the above mentioned depositions, and my education, training, and experience, it is my opinion, to a reasonable degree of medical certainty, that even if Dr. Joekel had admitted Joaquin to the hospital on August 7, 2012, Joaquin's outcome would not have been any different.

7. There was no clinical evidence that Joaquin had EBV encephalitis when he presented to the emergency department in the morning on August 7, 2012. His symptoms were consistent with mononucleosis. . . . There is no treatment for mononucleosis. It is not possible to know when Joaquin's mononucleosis infection developed into

EBV encephalitis. Dr. Joekel acted within the standard of care by discharging Joaquin from the emergency department and sending him home. Based on the child's presenting symptoms, Dr. Joekel could not have anticipated the very rare complication that Joaquin's mononucleosis would develop into [EBV encephalitis] and spread to his brain.

8. Dr. Lawrence suggests that Dr. Joekel should have admitted Joaquin to the hospital. He also opines that blood tests should have been done and a lumbar puncture should have been done on Joaquin. . . . Even if the tests had been done, the results would not have been immediately available, and even if the lumbar puncture results had come back showing EBV encephalitis, there is no specific treatment for EBV encephalitis. There is nothing that could have been done for Joaquin in the hospital that would have prevented the virus from spreading to his brain.

9. Dr. Lawrence further suggests that Joaquin should have been given the medication acyclovir as treatment for EBV encephalitis. However, there is no scientific evidence that acyclovir works to treat EBV encephalitis or to stop the spread of the virus. There is no scientific evidence that administering IV fluids or antibiotics stops the spread of this virus. Further, there is no scientific evidence supporting Dr. Lawrence's opinion that providing this type of supportive care would have prevented Joaquin from having a seizure or reduced Joaquin's chance of having a seizure.

10. The viral infection EBV encephalitis caused Joaquin's brain injury. There is no evidence that a delay in treatment caused or contributed to Joaquin's brain injury. Whether or not Joaquin was in the hospital at the time he had a seizure would not have changed the ultimate outcome and would not have prevented the brain damage he suffered.

(g) Medical Literature

In the medical literature excerpts received by the court, Appellees provided various sections of books, articles, and reviews on the subjects of EBV, encephalitis, meningitis, and seizures.

First, in an article from the New England Journal of Medicine, the authors identify that "[i]nfectious mononucleosis is a clinical syndrome that is most commonly associated with primary [EBV] infection." Katherine Luzuriaga, M.D., & John L. Sullivan, M.D., *Infectious Mononucleosis*, 362 New Eng. J. Med. 1993, 1993 (2010). For the management of infectious mononucleosis, the authors provide:

> On the basis of clinical experience, supportive care is recommended for patients with infectious mononucleosis. Acetaminophen or nonsteroidal antiinflammatory agents are recommended to manage fever, throat discomfort, and malaise. Adequate fluid intake and nutrition should also be encouraged. Although getting adequate rest is prudent, bed rest is unnecessary.

Id. at 1996-97. On the issue of utilizing antiviral treatment of infectious mononucleosis, the authors stated that "[l]arger randomized, blinded, placebo-controlled trials are necessary," *id.* at 1997, concluding "[t]reatment is largely supportive; antiviral therapy is not recommended, and corticosteroids are not indicated for uncomplicated cases," *id.* at 1998.

Another article explores treatment for EBV and describes that "[a]lthough there are no definitive effective treatments in many cases of encephalitis, identification of a specific agent may be important for prognosis, potential prophylaxis, counseling of patients and family members, and public health interventions." Allen R. Tunkel et al., *The Management of Encephalitis: Clinical Practice Guidelines by the Infectious Diseases Society of America*, 47 Clinical Infectious Diseases 303, 303 (2008). Specifically, as to acyclovir's possible use for EBV treatment, the authors write:

> Acyclovir inhibits replication of [EBV] in vitro, but a meta-analysis of 5 clinical trials did not show benefit in

> the treatment of infectious mononucleosis . . . . Although acyclovir has been used in some cases of [a central nervous system] disease . . . , it probably provides little or no benefit and is not recommended.

Id. at 323.

One textbook discusses the use of acyclovir to treat EBV and specifically provides that "[a]cyclovir should be used to treat herpes simplex and [varicella zoster virus] encephalitis and perhaps encephalitis caused by [EBV]." 1 Ralph D. Feigin, M.D., et al., Feigin & Cherry's Textbook of Pediatric Infectious Diseases 511 (6th ed. 2009) (quoting chapter 42 entitled "Encephalitis and Meningoencephalitis"). The textbook, however, also provides that "[t]he effectiveness of various recommended regimens in most instances has not been evaluated objectively." *Id.*

Similarly, in a review, the authors discuss possible treatment for infectious mononucleosis, but find "[t]here is no approved treatment." Henry H. Balfour, Jr., et al., *Infectious Mononucleosis*, 4 Clinical & Translational Immunology 1, 5 (2015). Although the authors mention "valacyclovir" as a possible antiviral drug to help treat EBV, they conclude: "As our study contained few subjects and was not placebo controlled, these results must be confirmed in a larger, placebo-controlled trial." *Id.*

The authors of another review looked at trials from the use of antiviral agents on infectious mononucleosis and concluded:

> The effectiveness of antiviral agents (acyclovir, valomaciclovir and valacyclovir) in acute [infectious mononucleosis] is uncertain. The quality of the evidence is very low. . . . Alongside the lack of evidence of effectiveness, decision makers need to consider the potential adverse events and possible associated costs, and antiviral resistance. Further research in this area is warranted.

M. De Paor et al., *Antiviral Agents for Infectious Mononucleosis (Glandular Fever)*, Cochrane Database of Systematic Reviews, Issue 12, Art. No.: CD011487 (2016).

In a report, the authors discuss possible treatments for infectious mononucleosis, stating:

> Patients suspected to have infectious mononucleosis should not be given ampicillin or amoxicillin, which cause nonallergic morbilliform rashes in a high proportion of patients with active EBV infection. Although therapy with short-course corticosteroids may have a beneficial effect on acute symptoms, because of potential adverse effects, their use should be considered only for patients with marked tonsillar inflammation with impending airway obstruction, massive splenomegaly, myocarditis, hemolytic anemia, or HLH. . . . Although acyclovir has in vitro antiviral activity against EBV, therapy is of no proven value in infectious mononucleosis . . . .

American Academy of Pediatrics, Red Book: Report of the Committee on Infectious Diseases 321 (29th ed. 2012).

Finally, another review discusses the use of antiepileptic drugs for the treatment of seizures due to viral encephalitis, in which review the authors conclude:

> It remains unclear whether antiepileptic drugs reduce the risk of seizures during the acute phase of the illness or decrease morbidity and mortality when used as primary prophylaxis. It is also unclear whether antiepileptic drugs reduce the risk of further seizures when used as secondary prophylaxis. Use of antiepileptic drugs carries an inherent risk of adverse events. In the absence of any evidence from randomized or quasi-randomized controlled trials, no recommendations can be made regarding the use of antiepileptic drugs as primary or secondary prophylaxis for seizures in patients with viral encephalitis.

S. Pandey et al., *Antiepileptic Drugs for the Primary and Secondary Prevention of Seizures in Viral Encephalitis*, Cochrane Database of Systematic Reviews, Issue 5, Art. No.: CD010247 (2016).

4. Orders on Motions

In March 2017, the court entered orders on these motions. On Appellants' motion to qualify their expert and Appellees' motion to strike the testimony of Dr. Lawrence, the court entered an order precluding testimony by Dr. Lawrence on the issue of causation, stating:

> Based on the evidence before the Court, the Court determines that Dr. Todd Lawrence M.D. is a qualified expert in the field of emergency room medicine. The Court finds that based on the deposition of Dr. Lawrence, he is not qualified by virtue of training, expertise or experience to render any opinions on the progress or causation of this child's condition. Such opinions would require expertise and qualification in the specialty of neurology and specifically child neurology. As a result of this failure of qualifications, Dr. Todd Lawrence's opinions cannot be allowed. The Court also notes that Dr. Lawrence's opinion[s] are also inadmissible because they are all opinions of the "loss of chance" of the child to obtain a better result.

Because of this preclusion and because Appellants offered no other proposed evidence on the issue of causation, the court granted summary judgment in favor of Appellees in a separate order. The court also stated that summary judgment was appropriate because the evidence submitted by Appellees in support of their motion for summary judgment precluded the existence of any issue of material fact and showed Appellees were entitled to a judgment as a matter of law. Appellants filed an appeal of these rulings.

III. ASSIGNMENTS OF ERROR

Appellants assign, restated, that the district court erred by (1) excluding the opinions of Dr. Lawrence on the subject of causation of Joaquin's injuries, (2) denying Appellants' objection to the affidavits of Drs. Pavkovic and Chatterjee in support of Appellees' motion for summary judgment, and (3) granting Appellees' motion for summary judgment.

IV. STANDARD OF REVIEW

[1-3] Abuse of discretion is the proper standard of review of a district court's evidentiary ruling on the admission of expert testimony under *Daubert v. Merrell Dow Pharmaceuticals, Inc.*, 509 U.S. 579, 113 S. Ct. 2786, 125 L. Ed. 2d 469 (1993). *State v. Hill*, 288 Neb. 767, 851 N.W.2d 670 (2014). A judicial abuse of discretion exists when a judge, within the effective limits of authorized judicial power, elects to act or refrain from acting, but the selected option results in a decision which is untenable and unfairly deprives a litigant of a substantial right or a just result in matters submitted for disposition through a judicial system. *Id.* To constitute reversible error in a civil case, the admission or exclusion of evidence must unfairly prejudice a substantial right of a litigant complaining about evidence admitted or excluded. *Richardson v. Children's Hosp.*, 280 Neb. 396, 787 N.W.2d 235 (2010).

V. ANALYSIS

1. Dr. Lawrence's Causation Testimony

Appellants first assign the district court erred in denying their motion to qualify Dr. Lawrence's expert testimony and granting Appellees' motion to strike Dr. Lawrence's expert testimony on causation. Specifically, Appellants argue Dr. Lawrence's testimony on causation of Joaquin's injuries did not amount to loss-of-chance testimony and that Dr. Lawrence was qualified to testify regarding causation.

(a) Loss-of-Chance Testimony

Appellants claim the district court erred in finding Dr. Lawrence's opinions inadmissible as opinions of the loss of chance of Joaquin to obtain a better result. Appellees argue the court did not err because Dr. Lawrence's testimony was speculative, lacked certainty, and amounted to loss-of-chance testimony.

[4-8] Expert medical testimony must be based on a reasonable degree of medical certainty or a reasonable probability. *Edmonds v. IBP, inc.*, 239 Neb. 899, 479 N.W.2d 754 (1992).

An objection to the opinion of an expert based upon the lack of certainty in the opinion is an objection based upon relevance. *Richardson, supra*. Relevant evidence means evidence having any tendency to make the existence of any fact that is of consequence to the determination of the action more or less probable than it would be without the evidence. *Id*. "Magic words" indicating that an expert's opinion is based on a reasonable degree of medical certainty or probability are not necessary. *Id*. An expert opinion is to be judged in view of the entirety of the expert's opinion and is not validated or invalidated solely on the basis of the presence or lack of the magic words "reasonable medical certainty." *Id*.

[9,10] The requirement that expert medical testimony be based on a reasonable degree of medical certainty or reasonable probability requires that causation testimony move beyond a mere loss of chance—or a "diminished likelihood of achieving a more favorable medical outcome." See *Cohan v. Medical Imaging Consultants*, 297 Neb. 111, 122, 900 N.W.2d 732, 740 (2017), *modified on denial of rehearing* 297 Neb. 568, 902 N.W.2d 98. As the Nebraska Supreme Court provided in *Richardson*, 280 Neb. at 405, 787 N.W.2d at 243, "'[L]oss of chance,' . . . in Nebraska, is insufficient to establish causation."

The Nebraska Supreme Court discussed loss-of-chance testimony in *Rankin v. Stetson*, 275 Neb. 775, 749 N.W.2d 460 (2008). In *Rankin*, the plaintiff offered expert testimony that stated "it was more likely than not" that the plaintiff would have recovered from her spinal cord injury had surgery been performed within the first 72 hours. 275 Neb. at 779, 749 N.W.2d at 464. The Nebraska Supreme Court stated that an opinion that a plaintiff would have had a "'better prognosis'" and a "'chance of avoiding permanent neurological injury'" did not establish the certainty of proof that was required. *Id*. at 787, 749 N.W.2d at 469. Nevertheless, because the doctor's opinion also stated that early surgical decompression of the spinal cord more likely than not would have led to

an improved outcome, the evidence was sufficient to establish causation. *Id*. See, also, *Richardson v. Children's Hosp.*, 280 Neb. 396, 406, 787 N.W.2d 235, 243 (2010) (finding that expert's opinion that patient "could have recovered" had patient, who died of necrotizing hemorrhagic pancreatitis, earlier received IV fluids was given with sufficient degree of medical certainty and was sufficient to establish causation for purposes of patient's mother's medical malpractice case against physician and hospital).

Here, we note that Dr. Lawrence's testimony governing causation differed in relation to Dr. Joekel's failure to admit Joaquin to the hospital for supportive care to treat EBV meningoencephalitis and in relation to Dr. Joekel's failure to admit Joaquin to the hospital and monitor and implement treatment to control Joaquin's seizure. We will address those matters separately.

Regarding supportive care to treat EBV meningoencephalitis, Dr. Lawrence opined that Dr. Joekel should have admitted Joaquin, ordered IV fluids, antivirals, and more aggressive fever medications. That said, in testimony governing the issue of supportive treatment, Dr. Lawrence conceded that the offered treatment would not directly treat Joaquin's underlying illness, the EBV meningoencephalitis. Instead, Dr. Lawrence contends hydration and IV fluids, antiviral medications, monitoring, and more aggressive fever medications would have put Joaquin's body in a better state to fight the infection itself. Although Dr. Lawrence acknowledged he was not certain it would have changed the result, he opined that "[the supportive treatment] may have decreased [Joaquin's] chance of actually developing the encephalitis that triggered the seizure" and "would have decreased the chance of having the seizure." This acknowledged lack of certainty together with the language of "decreased the chance" provided the district court a sufficient basis to find this amounted to loss-of-chance testimony which, in Nebraska, is insufficient to establish causation. Accordingly, we affirm that portion of the court's order

striking Dr. Lawrence's opinions governing the failure to treat Joaquin as it relates to the progression of the EBV or the decreased chance of having a seizure.

Regarding Dr. Joekel's failure to admit Joaquin and provide supportive care to control Joaquin's seizure once it occurred, Dr. Lawrence's testimony is different. Dr. Lawrence testified that monitoring Joaquin in the hospital and supplying him with medical treatment would have mitigated the effects of his seizure. He testified that the seizure could have been better managed if Joaquin had been in the hospital to better control his fever and hydration, to employ the use of antiepileptic drugs, and to more rapidly address his lack of oxygen issues as they arose. Specifically, he provided: "[Joaquin] would have had a decreased length of hypoxia, decreased length of the seizure, and would have had a better outcome, which, with the reasonable degree of certainty, [Joaquin would then] not have had the craniotomy and all the procedures that followed that."

Unlike his testimony concerning the utility of supportive treatments to address the progression of Joaquin's underlying viral infection and seizure avoidance, the above-quoted testimony provides greater certainty and moves beyond a mere loss of chance—or a "diminished likelihood of achieving a more favored medical outcome." See *Cohan v. Medical Imaging Consultants*, 297 Neb. 111, 122, 900 N.W.2d 732, 740 (2017), *modified on denial of rehearing* 297 Neb. 568, 902 N.W.2d 98. Dr. Lawrence did not testify that hospitalizing and treating Joaquin for his seizure would have increased his chance of a better outcome. He explicitly testified that proper medical treatment of the seizure at the hospital would have, to a reasonable degree of certainty, resulted in a better outcome. Such certainty is in line with the accepted language outlined in *Richardson v. Children's Hosp.*, 280 Neb. 396, 787 N.W.2d 235 (2010), and *Rankin v. Stetson*, 275 Neb. 775, 749 N.W.2d 460 (2008), and does not amount to loss-of-chance testimony. Therefore, the district court erred in determining

Dr. Lawrence's specific line of causation testimony linking Joaquin's injuries to Dr. Joekel's failure to admit Joaquin and monitor and implement treatment to control Joaquin's seizure amounted to loss-of-chance opinion testimony and lacked relevancy. This leads to Appellants' second assigned error that the district court erred in finding Dr. Lawrence was not qualified to render his causation opinion.

(b) Professional Qualifications of Expert Witnesses

Appellants claim the district court erred in determining Dr. Lawrence was not qualified to testify on the subject of causation of Joaquin's injuries. In its order denying Appellants' motion to qualify its expert and granting Appellees' motion to strike Dr. Lawrence's expert testimony, the district court stated that "he is not qualified by virtue of training, expertise or experience to render any opinions on the progress or causation of [Joaquin's] condition."

[11-13] Under Neb. Rev. Stat. § 27-702 (Reissue 2016), a witness can testify concerning scientific, technical, or other specialized knowledge only if the witness is qualified as an expert. *Carlson v. Okerstrom*, 267 Neb. 397, 675 N.W.2d 89 (2004). Whether a witness is qualified as an expert is a preliminary question for the trial court. *Id.* In *Schafersman v. Agland Coop*, 262 Neb. 215, 631 N.W.2d 862 (2001), the Nebraska Supreme Court adopted the test set forth in *Daubert v. Merrell Dow Pharmaceuticals, Inc.*, 509 U.S. 579, 113 S. Ct. 2786, 125 L. Ed. 2d 469 (1993), for the evaluation of expert opinion testimony. Under this evaluation, the trial court acts as a gatekeeper to ensure the evidentiary relevance and reliability of an expert's opinion. See, *State v. Daly*, 278 Neb. 903, 775 N.W.2d 47 (2009); *Schafersman, supra*. The purpose of the gatekeeping function is to ensure that the courtroom door remains closed to "junk science" that might unduly influence the jury, while admitting reliable expert testimony that will assist the trier of fact. *State v. Casillas*, 279 Neb. 820, 782 N.W.2d 882 (2010).

[14,15] Under § 27-702 and *Daubert*/*Schafersman* jurisprudence, before admitting expert opinion testimony, the trial court must (1) determine whether the expert's knowledge, skill, experience, training, and education qualify the witness as an expert; (2) if an expert's opinion involves scientific or specialized knowledge, determine whether the reasoning or methodology underlying the testimony is valid; (3) determine whether that reasoning or methodology can be properly applied to the facts in issue; and (4) determine whether the expert evidence and the opinions related thereto are more probative than prejudicial. See *State v. Tolliver*, 268 Neb. 920, 689 N.W.2d 567 (2004). See, also, *State v. Braesch*, 292 Neb. 930, 874 N.W.2d 874 (2016). A *Daubert*/*Schafersman* challenge should take the form of a concise pretrial motion and should identify which of these factors—the expert's qualifications, the validity/reliability of the expert's reasoning or methodology, the application of the reasoning or methodology to the facts, and/or the probative or prejudicial nature of the testimony—is believed to be lacking. See *Casillas, supra*.

Here, the district court excluded Dr. Lawrence's causation testimony solely on the basis of his qualification to give such opinion. It is unclear from the record whether Appellees' challenge to Dr. Lawrence was limited to his qualifications to testify or whether Appellees were extending their challenge to his theory or methodology and/or his application of the facts to his theory or methodology. See brief for appellees at 28 (arguing that Dr. Lawrence's opinions "were not sufficiently reliable"). We note the Nebraska Supreme Court's admonition that a *Daubert*/*Shafersman* challenge should specifically identify which of the factors is believed to be lacking. We also note this record is somewhat devoid of analysis as it relates to those other specific factors. Because the district court's order was limited to striking Dr. Lawrence on the sole issue of his qualifications to testify, we now examine that specific factor.

[16] We first note that testimony of qualified medical doctors cannot be excluded simply because they are not specialists in

a particular school of medical practice. *Carlson v. Okerstrom*, 267 Neb. 397, 675 N.W.2d 89 (2004). Thus, Dr. Lawrence's testimony is not unqualified merely because he is not board certified in pediatrics, neurology, or infectious disease.

[17,18] Whether a witness is an expert under § 27-702 depends on the factual basis or reality behind a witness' title or underlying a witness' claim to expertise. *State v. Reynolds*, 235 Neb. 662, 457 N.W.2d 405 (1990). Experts or skilled witnesses will be considered qualified if, and only if, they possess special skill or knowledge respecting the subject matter involved so superior to that of persons in general as to make the expert's formation of a judgment a fact of probative value. *Carlson, supra*.

Here, Dr. Lawrence's deposition and curriculum vitae provide that he is employed as the medical director and a staff physician of the emergency department at an Iowa medical center where he has worked since 2003. Although he is also an administrator, he spends the majority of his time working as an emergency department physician. He is board certified in family practice, but his practice is entirely with the emergency department and 30 to 40 percent of his patients are pediatric patients. Although he has never diagnosed a patient with EBV encephalitis or meningitis, he has treated patients with viral meningitis and has an average of two patients per month who present with mononucleosis. Of those patients with mononucleosis, he has hospitalized patients showing significant illness at a rate of two or three per year. As to seizures and their relation to brain injury, Dr. Lawrence testified that he has "seen plenty of patients in [his] career with brain injuries related to seizures." Although Dr. Lawrence is not board certified in pediatric neurology, he has experience in the treatment of pediatric patients, viral infections, and neurologic conditions related to seizures.

Additionally, Dr. Lawrence's answers during his deposition to questioning about EBV, mononucleosis, encephalitis, and meningitis correlate with the information on treatment

contained in the medical literature and expert depositions and affidavits offered by Appellees on these subjects. The medical literature and Appellees' expert witnesses explained that there is no treatment for EBV specifically and that any treatment for EBV and EBV encephalitis is supportive in nature. Dr. Lawrence acknowledged this fact and indicated his offered treatment for Joaquin was directed at this supportive care. According to Dr. Lawrence, the suggested IV fluids, fever monitoring and responsive medication, and antiviral medications would have been implemented in order to assist Joaquin's body in fighting the virus and addressing the symptoms of EBV meningoencephalitis. Although Appellees, through their offered exhibits, argued such treatment would likely have not changed the end result, the offered exhibits do not contest that such treatment is typical for this medical condition.

Notwithstanding the above, Dr. Lawrence's testimony diverts from the testimony of Drs. Pavkovic and Chatterjee in his opinion about linking Joaquin's brain injury to his uncontrolled seizure. In short, Dr. Lawrence claims Dr. Joekel failed to hospitalize, treat, and control Joaquin's seizure which then contributed to Joaquin's brain injury while Drs. Pavkovic and Chatterjee relate Joaquin's brain injury solely as a manifestation of the untreatable EBV meningoencephalitis.

In support of his opinion, Dr. Lawrence testified that Dr. Joekel deviated from the standard of care by failing to hospitalize Joaquin. He stated that Joaquin, once hospitalized, would have had his hydration monitored, been started on IV fluids, been provided antivirals, and had his fever more effectively managed through monitoring and responsive medication. By hospitalizing and implementing monitoring and supportive treatment, his body would have been better prepared to lessen his seizure and he would have had the seizure in the hospital where its staff would be able to immediately diagnose the seizure, limit the extent and duration of his seizure through the use of antiepileptic medication, and immediately address any lack of oxygen issues as they arose.

Having failed to provide that supportive care, Dr. Lawrence testified with reasonable medical certainty that Joaquin's uncontrolled seizure contributed, along with his EBV meningoencephalitis, to his brain injury in two ways: First, Joaquin's seizure was long in duration and long seizures can produce brain injuries on their own. Second, Joaquin's seizure resulted in his having to get a tracheostomy due to lack of oxygen. Dr. Lawrence testified that lack of oxygen may lead to lack of oxygen to the brain and result in brain injury. In sum, Dr. Lawrence testified with a reasonable degree of medical certainty that had Joaquin been in the hospital and received treatment and monitoring as required by Dr. Lawrence's offered standard of care, the medical attendants would have been able to mitigate these issues deriving from the seizure and limited the duration and extent of the seizure. Dr. Lawrence also testified with a reasonable degree of medical certainty that the need for Joaquin's tracheostomy would have been diminished if Joaquin had the seizure at the hospital and the staff was monitoring his oxygen levels and responding appropriately during the seizure. As such, the monitoring and treatment for the lack of oxygen would have prevented the tracheostomy and resulting scarring.

Conversely, the medical literature and expert affidavits offered by Appellees did not specifically address the ability of hospital staff to mitigate the effects of the seizure. Instead, the literature addressed only whether antiepileptic drugs reduce the initial or secondary risk of having seizures. Appellees' experts' affidavits stated only that there is no scientific evidence that supportive treatment would have prevented the seizure and that the treatment for the seizures would not have prevented Joaquin's brain injury. To the extent that the literature and affidavits conflict with Dr. Lawrence's testimony on the treatment of seizures and their effect on Joaquin's brain injury, this presents a question of fact. See *Hawkins v. City of Omaha*, 261 Neb. 943, 627 N.W.2d 118 (2001) (explaining that question of whether one expert and his conclusions is more qualified than

another expert and his conclusions goes only to weight of testimony and that determining weight that should be given expert testimony is uniquely province of fact finder).

Dr. Lawrence's testimony was that Dr. Joekel's failure to hospitalize and control the seizure contributed to Joaquin's brain injury. Although Dr. Lawrence testified he would defer to a pediatric neurologist on the precise amount each factor contributed to Joaquin's brain injury, he is not required to be able to testify on the percentage of the brain injury caused by the lack of treatment compared to that caused by Joaquin's EBV meningoencephalitis. See *Thone v. Regional West Med. Ctr.*, 275 Neb. 238, 250, 745 N.W.2d 898, 908 (2008) (in medical malpractice context, "the element of proximate causation requires proof that the physician's deviation from the standard of care caused *or contributed to* the injury or damage to the plaintiff") (emphasis supplied). See, also, *Microfinancial, Inc. v. Premier Holidays Intern.*, 385 F.3d 72, 80 (1st Cir. 2004) (describing that federal counterpart to § 27-702 "is not so wooden as to demand an intimate level of familiarity with every component of a transaction or device as a prerequisite to offering expert testimony" when considering qualifications of any expert as applied to specific issue in case).

Dr. Lawrence is an experienced emergency room doctor who has experience treating pediatric patients, mononucleosis viral encephalitis and meningitis, and seizures. His deposition testimony largely coincides with the medical information supplied by Appellees' experts' affidavits and depositions, as well as medical literature. When offering his medical opinions on the causation of Joaquin's brain injury and scarring, Dr. Lawrence testified with a reasonable degree of medical certainty, utilizing his training and experience as an emergency department doctor, that proper care by Dr. Joekel would have decreased, if not eliminated, Joaquin's injuries.

During oral argument, Appellants' counsel argued that

> as [the judge] said in his order that it would have required a pediatric neurologist to opine on this [and] if that's

> where we're going, I just need to know we're moving into the world of specialty medicine and we're kind of abandoning the old concept that a medical doctor can testify in an area of specialization even if he is a generalist.

Dr. Lawrence clearly possesses special knowledge respecting the causation of brain injury and scarring from seizures superior to that of persons in general as to make his formation of a judgment a fact of probative value. See *State v. Herrera*, 289 Neb. 575, 856 N.W.2d 310 (2014) (explaining that court should not require absolute certainty, but should admit expert testimony if there are good grounds for expert's conclusion, even if there could possibly be better grounds for some alternative conclusion). If Appellees have more specialized experts and evidence to attack Dr. Lawrence's conclusions, Appellees remain capable of cross-examining Dr. Lawrence and bringing their own experts and evidence to counter his opinions. However, this becomes a question of fact for the fact finder. See, generally, *Pineda v. Ford Motor Co.*, 520 F.3d 237 (3d Cir. 2008) (it is abuse of discretion to exclude testimony simply because trial court does not deem proposed expert to be best qualified or because proposed expert does not have specialization that court considers most appropriate); *U.S. v. Sandoval-Mendoza*, 472 F.3d 645, 655 (9th Cir. 2006) (because medical expert opinion testimony is based on specialized, as distinguished from scientific, knowledge, "'*Daubert* factors are not intended to be exhaustive or unduly restrictive'"); *Robinson v. GEICO General Ins. Co.*, 447 F.3d 1096 (8th Cir. 2006) (most courts have held that physician with general knowledge may testify regarding medical issues that specialist might treat in clinical setting); R. Collin Mangrum, Mangrum on Nebraska Evidence 690 (2018) (more accurate or complete statement would be that physicians are competent in great number of cases by education, training, and experience to testify about both matters observed as physicians and opinions based upon reasonably relied upon medical experts).

We hold that, on this record, the district court abused its discretion in determining that Dr. Lawrence was unqualified under § 27-702 to testify on causation as to the injuries Joaquin suffered due to Dr. Joekel's failure to hospitalize, treat, and control Joaquin's seizure, the sole causation opinion offered by Dr. Lawrence which was stated with the degree of certainty or probability necessary to make it relevant. In finding that Dr. Lawrence is qualified by his education, training, and background to render this opinion, we express no opinion as to whether his theory or methodology supporting the opinion are valid, whether the theory or methodology were properly applied to the facts in this case, or whether Dr. Lawrence's testimony is more probative or prejudicial. To the extent Appellees were challenging those factors, those components of the *Daubert*/*Schafersman* analysis were not addressed by the district court in its order. See *Zimmerman v. Powell*, 268 Neb. 422, 430, 684 N.W.2d 1, 9 (2004) (holding "the trial court 'must explain its choices' so that the appellate court has an adequate basis to determine whether the analytical path taken by the trial court was within the range of reasonable methods for distinguishing reliable expert testimony from false expertise"). We recognize the court likely did not address those factors either because it did not believe they were being challenged or because its ruling made it unnecessary to address the remaining factors.

Either way, because the trial court did not address those factors, we are unable to review the court's analysis governing these factors. This results in prejudice to Appellants whose case has been dismissed due to the striking of Dr. Lawrence's testimony. Some courts have held that when a trial court fails to make required findings, the appellate court should conduct the *Daubert*/*Schafersman* analysis on the appellate record. See, *Kinser v. Gehl Co.*, 184 F.3d 1259 (10th Cir. 1999), *abrogated on other grounds, Weisgram v. Marley Co.*, 528 U.S. 440, 120 S. Ct. 1011, 145 L. Ed. 2d 958 (2000); *Tanner v. Westbrook*, 174 F.3d 542 (5th Cir. 1999), *superseded on other*

grounds, Fed. R. Evid. 103(a). But our Supreme Court has held that this improperly shifts the gatekeeping duty from the trial courts to the appellate courts. *Zimmerman, supra*.

The dissent agrees that Dr. Lawrence was qualified to testify as an expert, but determined that the district court did not exclude Dr. Lawrence based upon his credentials. The dissent states the district court's ruling goes further and reaches an analysis of Dr. Lawrence's "reasoning or methodology to reach his opinions." The dissent then analyzes the record as it relates to Dr. Lawrence's methodology and application of the facts to the methodology. This court's differing interpretations of the district court's order here underscore the importance of the Nebraska Supreme Court's admonition to counsel in *State v. Casillas*, 279 Neb. 820, 782 N.W.2d 882 (2010), that a *Daubert*/*Schafersman* challenge should take the form of a concise pretrial motion and should identify which of these factors—the expert's qualifications, the validity/reliability of the expert's reasoning or methodology, the application of the reasoning or methodology to the facts, and/or the probative or prejudicial nature of the testimony—is believed to be lacking. It further underscores the importance of the Supreme Court's admonition to the trial court in *Zimmerman v. Powell*, 268 Neb. 422, 430, 684 N.W.2d 1, 9 (2004), that the trial court

> "must explain its choices" so that the appellate court has an adequate basis to determine whether the analytical path taken by the trial court was within the range of reasonable methods for distinguishing reliable expert testimony from false expertise. Margaret A. Berger, *The Supreme Court's Trilogy on the Admissibility of Expert Testimony*, in Reference Manual on Scientific Evidence 29 (Federal Judicial Center 2d ed. 2000).

Assuming that Appellees were challenging the validity/reliability of the expert's reasoning or methodology here, or Dr. Lawrence's application of the facts to that reasoning/methodology, the majority finds no analytical path in the trial

court's order sufficient to review those elements. The trial court's order held that Dr. Lawrence "is not qualified by virtue of training, expertise or experience to render any opinions on the progress or causation of this child's condition." We interpret the court's order as finding that Dr. Lawrence was not qualified to issue any opinion here on causation, not that his opinion was unreliable and should be excluded. Nor do we find any explanation of the trial court's choices here as they relate to Dr. Lawrence's methodology or application of fact to methodology so as to review the analytical path taken by the trial court as it relates to those elements. Accordingly, we remand this matter for further proceedings.

2. AFFIDAVITS OF DRS. PAVKOVIC AND CHATTERJEE

[19] Appellants next assign the district court erred in overruling their objection to the affidavits of Drs. Pavkovic and Chatterjee. At the hearing, Appellants orally objected to the affidavits, stating: "We object . . . on 402, 403, 702, Schafersman 1 and 2, [and] Kuhmo Tire." Denying Appellants' request for further argument and overruling the objection, the court stated: "For the purposes of this hearing, the exhibits will be received." Although this issue is no longer essential to the disposition of this appeal, an appellate court may, at its discretion, discuss issues unnecessary to the disposition of an appeal where those issues are likely to recur during further proceedings. *Nebraska Account. & Disclosure Comm. v. Skinner*, 288 Neb. 804, 853 N.W.2d 1 (2014).

[20-22] As we previously noted, a trial court, when faced with a *Daubert*/*Schafersman* objection, "'must adequately demonstrate by specific findings on the record that it has performed its duty as gatekeeper.'" *Zimmerman v. Powell*, 268 Neb. 422, 430, 684 N.W.2d 1, 9 (2004). After such a *Daubert*/*Schafersman* objection has been made, "the losing party is entitled to know that the trial court has engaged in the '"'heavy cognitive burden'"' of determining whether the challenged testimony was relevant and reliable, as well

as a record that allows for meaningful appellate review." *Zimmerman*, 268 Neb. at 430, 684 N.W.2d at 9, quoting *Schafersman v. Agland Coop*, 262 Neb. 215, 631 N.W.2d 862 (2001). "'Without specific findings or discussion on the record, it is impossible . . . to determine whether the [trial] court "'carefully and meticulously' review[ed] the proffered scientific evidence" or simply made an off-the-cuff decision to admit expert testimony.'" *Zimmerman v. Powell*, 268 Neb. 422, 430, 684 N.W.2d 1, 9 (2004). This means that the trial court must explain its choices so that the appellate court has an adequate basis to determine whether the analytical path taken by the trial court was within the range of reasonable methods for distinguishing reliable expert testimony from false expertise. *Id.*

Here, the court did not allow Appellants to provide their reasons for the objections, but Appellants did make it clear they were challenging the affidavits on *Daubert*/*Schafersman* grounds. The court summarily overruled Appellants' objections and failed to provide its reasoning. As such, the court erred in failing to supply such reasoning and abdicated its gatekeeping function under *Daubert*/*Schafersman* jurisprudence.

3. Appellees' Motion for Summary Judgment

Lastly, Appellants assign the district court erred in granting summary judgment in favor of Appellees. The district court entered its order after precluding Dr. Lawrence's testimony on causation. Because we determined the court erred in determining Dr. Lawrence was unqualified to testify as to causation on the sole issue of Joaquin's injuries suffered as a consequence of Dr. Joekel's failure to admit, monitor, and treat Joaquin for his seizure and because this testimony did not amount to loss-of-chance testimony, the court erred in not considering Dr. Lawrence's causation testimony on the motion for summary judgment. Therefore, we reverse the court's order on Appellees' motion for summary judgment and remand the matter for further proceedings consistent with this opinion.

VI. CONCLUSION

We conclude the district court erred in determining that Dr. Lawrence was unqualified under § 27-702 to testify on causation as to the injuries Joaquin suffered due to Dr. Joekel's failure to hospitalize and treat Joaquin for his seizure, the sole causation opinion offered by Dr. Lawrence which was stated with the degree of certainty or probability necessary to make it relevant. We affirm the district court's order as to all other testimony on causation as being irrelevant loss-of-chance testimony. We additionally conclude the district court erred in failing to provide its reasoning for overruling Appellants' objections to the affidavits of Drs. Pavkovic and Chatterjee. Because the court erred in precluding Dr. Lawrence's testimony on causation as provided above, the court erred in granting Appellees' motion for summary judgment. Accordingly, we affirm in part, and in part reverse and remand for further proceedings in compliance with this opinion.

Affirmed in part, and in part reversed and remanded for further proceedings.

Bishop, Judge, concurring in part, and in part dissenting.

I would affirm the district court's decision to exclude the testimony of Dr. Lawrence and thus would affirm the summary judgment order in favor of the appellees. Under the *Daubert*/*Schafersman* framework, a trial court must ultimately determine whether the expert has presented enough rational explanation and empirical support to justify admitting his or her opinion into evidence. See *Zimmerman v. Powell*, 268 Neb. 422, 684 N.W.2d 1 (2004). The district court performed its *Daubert*/*Schafersman* gatekeeping function; therefore, this court reviews the district court's decision to admit or exclude expert testimony for an abuse of discretion. See *Hemsley v. Langdon*, 299 Neb. 464, 909 N.W.2d 59 (2018). This dissent addresses only those portions of the majority opinion related to Dr. Lawrence's causation opinion on the appellees' failure to hospitalize, treat, and control Joaquin's seizure; I find no abuse

of discretion by the district court in excluding this testimony. I concur with the remainder of the majority opinion.

The district court determined that Dr. Lawrence was a qualified expert in the field of emergency room medicine, but that he was not qualified to render any opinions on the progress or causation of Joaquin's condition. The district court stated that such opinions would require expertise and qualification in the specialty of neurology and, specifically, child neurology. As noted in the majority opinion, and as acknowledged by the appellees, medical expert witnesses cannot be excluded simply because they are not specialists in a particular school of medical practice. See *Carlson v. Okerstrom*, 267 Neb. 397, 675 N.W.2d 89 (2004). Rather, experts are considered qualified if they possess special skill or knowledge respecting the subject matter involved so superior to that of persons in general as to make the expert's formation of a judgment a fact of probative value. See *id*.

There is no question that Dr. Lawrence was qualified to testify as an expert. However, I agree with the appellees that the district court did not exclude Dr. Lawrence's testimony based upon his credentials (which is what the majority concludes); rather, the district court determined Dr. Lawrence was not qualified to render any opinions on the progress or causation of Joaquin's condition. This necessarily goes to the reliability or validity of Dr. Lawrence's reasoning or methodology to reach his opinions, and the underlying facts or data to support them. Although it would have been helpful for the district court to more specifically explain the reason it found Dr. Lawrence was not qualified to render a causation opinion, the court's order nevertheless sets forth an adequate basis to inform this court as to its reason. See *Zimmerman v. Powell, supra* (trial court need not recite *Daubert* standard, but must explain its decision so that appellate court has adequate basis to determine whether analytical path taken by trial court was within range of reasonable methods for distinguishing reliable expert testimony from false expertise).

Notably, the district court's determination that opinions on the progress or causation of Joaquin's condition would require expertise and qualification in the specialty of neurology and, specifically, child neurology is supported by Dr. Lawrence's own testimony. Although Dr. Lawrence is certainly qualified to testify about emergency room care, including the treatment of seizures, he had not treated a patient with EBV meningoencephalitis before and he repeatedly deferred to specialists in pediatric neurology and pediatric infectious diseases for answers to questions related to Joaquin's seizure and brain injury. Those experts opined that Joaquin "suffered mild brain damage as a result of the EBV encephalitis," "something about that virus's presence is what leads to the brain injury," there was "no evidence that the seizure . . . contributed to any brain injury," "[t]he viral infection . . . caused Joaquin's brain injury," and "[w]hether or not Joaquin was in the hospital at the time he had a seizure would not have changed the ultimate outcome and would not have prevented the brain damage he suffered."

Examples of Dr. Lawrence's deference to those experts follow: According to Dr. Joekel, EBV meningoencephalitis is a "very rare complication of a fairly common viral infection." Dr. Lawrence agreed that having mononucleosis develop or progress into encephalitis or meningitis is a "very uncommon" condition. When Dr. Lawrence was asked if he had ever treated a patient with mononucleosis that developed into encephalitis or meningitis, he was "not certain if [he had] or not." After agreeing that Joaquin had a seizure because of the "virus around his brain and in his spinal fluid" and that "IV hydration and medicine" would not have prevented the seizure, Dr. Lawrence testified that such treatment may have decreased his chance of having it. However, Dr. Lawrence also agreed that a pediatric neurologist or pediatric infectious disease expert would have more knowledge "about this area" than he would. Dr. Lawrence also deferred to the pediatric neurologist specialist for an opinion on whether Joaquin's seizure or

infection was more responsible for Joaquin's brain injury. Dr. Lawrence opined that both the seizure and the infection caused Joaquin's brain injury, but he was unable to render an opinion as to which was more responsible. He testified, "I'd have to defer that off to your pediatric neurologist that you referenced. But I think it's — clearly, it was both." When asked if Joaquin's seizure could have been totally prevented, Dr. Lawrence responded, "No. I never said that. I said his chance of seizure would have been less. I can't give you the number, but — and, yes, a pediatric neurologist or pediatric ID person would be able to better tell you that." Additionally, after stating that the "long seizure that [Joaquin] had [could] cause some of the brain damage," Dr. Lawrence was asked whether that opinion was based on any literature or science. He responded, "Nothing specific that I've looked at. But based on my training, expertise, and years of working." Dr. Lawrence testified that "50 different journals" are sent to his office which he reviews, but he did not review "any articles, textbooks, or anything else" to come up with his opinions.

At the hearing on the admissibility of Dr. Lawrence's opinions, the appellees argued that his opinions were unreliable. They asserted:

> As set forth in our brief, Dr. Lawrence is not giving a reliable opinion. And . . . that's distinguishable from . . . weight and credibility . . . . But the Court has a gatekeeping function to not allow an unreliable opinion to come before the jury. . . .
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> . . . So Dr. Lawrence testified that the child may not have had as serious or as severe of a seizure if he had been in the hospital . . . at the time. . . . [I]nstead of sending him home . . . he would have had a seizure in the hospital and it may or may not have been so severe as it was. And our position in the briefing . . . is that that is an unreliable opinion under Nebraska law, a loss of chance, because he can't say what the chance is of whether the seizure would

> have happened, he can't say what the chance is of how serious it would have been, he just thinks that it may have been less severe. And our position is that is not sufficient to state a causation opinion under Nebraska law.
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> At the core, our motion is that [Dr. Lawrence] is not giving a sufficiently reliable opinion that any of these things would have made a difference in the outcome that this child ultimately suffered in this case.
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> . . . Dr. Lawrence . . . says that the child may have had a decreased chance of having a seizure or may have had a less severe seizure. Saying it in that terminology we're saying is [an] unreliable opinion.

It is evident that the appellees did in fact challenge the reliability of Dr. Lawrence's opinions, which necessarily goes to his underlying reasoning or methodology. See *McNeel v. Union Pacific RR. Co.*, 276 Neb. 143, 753 N.W.2d 321 (2008) (preliminary assessment of whether reasoning or methodology underlying testimony is valid and can be properly applied to facts in issue establishes standard of evidentiary reliability). The essence of Dr. Lawrence's opinions is that Dr. Joekel should have somehow anticipated Joaquin might have a seizure 3 hours later and that therefore, Dr. Joekel should have admitted Joaquin to the hospital so the anticipated seizure could have been better controlled in a hospital environment. However, Dr. Lawrence admitted that even if Joaquin had been in the hospital, it may not have prevented him from having a seizure; rather, he broadly asserts that the seizure could have been treated "more quickly" which would have resulted in a "decreased length of hypoxia" and a "decreased length of the seizure," which he claimed would have resulted in "a better outcome." However, he never explains how or why that would have been the case given Joaquin's "rare" or "very uncommon" condition, and given his agreement that the seizure was not a "febrile seizure," but was instead caused by "this virus

around [Joaquin's] brain and in his spinal fluid." Nor does he ever actually testify as to the duration of Joaquin's seizure or hypoxia, or what impact the infection itself may have had on the duration of Joaquin's seizure versus any delayed seizure treatment. Nor does Dr. Lawrence explain why the professional medical care Joaquin received from the emergency paramedics or in the UNMC emergency room was any different in terms of impact on the seizure as compared to the treatment Joaquin would have received if he had been admitted earlier under Dr. Joekel's care. Further, Dr. Lawrence agreed patients could have seizures without brain injury. Yet, he provided no authoritative source or supporting data to support how, in this particular instance, Joaquin's seizure contributed to his brain injury other than to say it was a "long seizure" and if he had been in the hospital and had his seizure treated sooner, he would have had a better outcome.

In *Rankin v. Stetson*, 275 Neb. 775, 749 N.W.2d 460 (2008), a trial court excluded a neurosurgeon's testimony who had opined that the plaintiff would have recovered if surgical repair had occurred within the first 72 hours after her injury and that her chance of avoiding permanent injury decreased each day after the 72-hour period. The trial court excluded the opinion because the doctor failed to disclose the underlying facts or data for his opinions and, further, because the doctor did not qualify to give his opinion because he failed to set forth any methodology from which it could be determined that his opinions arose from facts or procedures that could be tested. In the doctor's deposition, he was asked for the basis of his opinion concerning the 72-hour timeframe; the doctor was unable to identify any specific article or peer-reviewed literature that would support his opinion concerning the 72-hour period. The Nebraska Supreme Court affirmed the trial court's decision to exclude the doctor's testimony, pointing out that the doctor was unable to say that his theory concerning the timeframe had been tested in any way, he was unable to provide a basis for his 72-hour theory, he could not cite any peer-reviewed literature

to support his theory, and he did not provide any testimony to suggest the 72-hour theory is generally accepted. Recently, the Nebraska Supreme Court referred to *Rankin v. Stetson, supra*, stating:

> We held that it was not an abuse of discretion for the district court to reject the expert's testimony, reasoning that the district court acted as a gatekeeper to ensure that the reasoning or methodology underlying the expert testimony was valid and properly applied. We explained that because the expert witness failed to disclose the underlying facts or data for his opinions, he was not qualified to testify to his opinion under § 27-702.

Hemsley v. Langdon, 299 Neb. 464, 475, 909 N.W.2d 59, 69 (2018).

Similarly here, as determined by the district court, Dr. Lawrence was not qualified to give an opinion on the progress or causation of Joaquin's condition. He was unable to provide a tested basis for how a "long seizure" occurring in a patient with EBV meningoencephalitis caused or contributed to the brain injury, he did not review or otherwise rely upon any peer-reviewed literature or other medical data to support his theory, and he did not provide any testimony to suggest his theory is generally accepted. Rather, in Dr. Lawrence's deposition, he asserted that Joaquin had "a long seizure . . . what they call status epilepticus, so his seizure was persistent" and that if he had been in the hospital, he "would have been treated sooner." He went on to state:

> But my opinion is that his chance of having a seizure would have been less. The seizure caused hypoxia, which caused a combination of — which, you know, he had to be put on a tube. . . . [H]is pH was low, which related to his lack of breathing, which could have caused some of the brain damage also.

Although Dr. Lawrence states that Joaquin's "lack of breathing . . . could have caused some of the brain damage," he acknowledged that Joaquin was breathing on his way to UNMC

with the fire department paramedics and that Joaquin was in the UNMC emergency room when he had "decreased respirations" which necessitated him being intubated. Dr. Lawrence was not critical of how the paramedics treated Joaquin on the way to UNMC, stating that "they did everything appropriate as far as giving medications and rushing him . . . to the hospital quickly." Nor was Dr. Lawrence critical of Joaquin's treatment in the UNMC emergency room. When asked if the UNMC emergency room staff "acted very promptly when [Joaquin] had respiratory issues, intubated him," and so "it's very unlikely he had any damage from their quick reaction to [Joaquin's] respiratory dysfunction," Dr. Lawrence responded, "I think they did a good job. I'm not critical of their care at all."

Also, although Dr. Lawrence claimed that the hypoxia began "from the time [Joaquin] started his seizure," he admitted that he had seen plenty of patients who have ongoing seizures who do not end up with a brain injury. He appeared to distinguish Joaquin's situation by saying that Joaquin "had a long extrapolated seizure." When asked how long the seizure was, Dr. Lawrence said, "Well, it started at home. We could pull the records and give it." However, there was never a response regarding the length of Joaquin's seizure, nor how the length of Joaquin's seizure may have compared to other patients with EBV meningoencephalitis who also suffered a seizure. When asked if admitting Joaquin to the hospital 3 hours prior to the seizure would have prevented the seizure, Dr. Lawrence responded:

> I didn't say that. I said his chance of having a seizure was less. I can't tell you that number. But if he did have a seizure, the seizure would more than likely, because he was in the hospital . . . then they could have more quickly treated his seizure with medications 20 to 30 minutes sooner in his seizure.
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> . . . My opinion would be that he — his seizure — they would have decreased the chance of having

> the seizure. He would have had a decreased length of hypoxia, decreased length of the seizure, and would have had a better outcome, which, with the reasonable degree of medical certainty, that he would not have had the craniotomy and all the procedures that followed that.

While this reads like loss-of-chance testimony to me, it also provides no foundational basis for how a decreased length of seizure would have resulted in a better outcome in a situation where Dr. Lawrence agreed the seizure was caused by a "virus around [Joaquin's] brain and in his spinal fluid," and he agreed the EBV meningoencephalitis was a cause of the brain injury. Although Dr. Lawrence alludes to Joaquin being treated with medications "20 to 30 minutes sooner" if he had been in the hospital, Dr. Lawrence provides no foundational basis for his reference to "20 to 30 minutes" or how earlier medication would have decreased the length of hypoxia or decreased the length of the seizure. Based upon Dr. Lawrence's testimony that the paramedics transporting Joaquin from his home "did everything appropriate as far as giving medications and rushing him . . . to the hospital," and further, that the UNMC emergency room staff "did a good job" and he was "not critical of their care at all," this leaves only the time from when Joaquin started having a seizure at home until the paramedics arrived as the period of time during which Joaquin was not being treated by medical professionals. Dr. Lawrence did not testify as to how long a period of time that was, nor did he opine that this initial period of seizure activity was the cause of Joaquin's brain injury. Rather, his focus was on the duration of the seizure and the hypoxia.

However, Dr. Lawrence fails to account for why Joaquin's seizure persisted despite being under professional medical care from the time the paramedics arrived through his care in the UNMC emergency room and thereafter. Dr. Lawrence fails to distinguish Joaquin's emergency medical care from the medical care Joaquin would have received if he had been admitted 3 hours earlier and how that distinction would have

impacted the duration of Joaquin's seizure and/or the hypoxia. Dr. Lawrence was unable to provide any authoritative source or supporting data for his opinions; rather, it was simply his subjective belief that the duration of the seizure and hypoxia contributed to Joaquin's brain injury and that if he had been in the hospital at the onset of the seizure, he would have had a better outcome. An expert's opinion must be based on good grounds, not mere subjective belief or unsupported speculation. *King v. Burlington Northern Santa Fe Ry. Co.*, 277 Neb. 203, 762 N.W.2d 24 (2009). Dr. Lawrence failed to present enough rational explanation and empirical support to justify admitting his opinion into evidence. See *Zimmerman v. Powell*, 268 Neb. 422, 684 N.W.2d 1 (2004). The district court did not abuse its discretion by excluding Dr. Lawrence's causation testimony, and therefore, its summary judgment order should be affirmed.