**OFFICE OF SPECIAL MASTERS**

**(Filed: May 29, 2003)**

| | | |
|---|---|---|
| TREY BORIN, by his Mother and Next Friend, AMBER BORIN, | * | |
| Petitioner, | * | **No. 99-491V** **TO BE PUBLISHED** |
| v. | * | |
| SECRETARY OF THE DEPARTMENT OF HEALTH AND HUMAN SERVICES, | * | |
| Respondent. | * | |

Ronald C. Homer, Sylvia Chin-Caplan, Boston, MA, for petitioner.
Joan E. Coleman, Washington, DC, for respondent.

## DECISION

**MILLMAN, Special Master**

Petitioner filed a petition on July 26, 1999 under the National Childhood Vaccine Injury Act, 42 U.S.C. § 300aa-10 et seq., alleging that her son Trey Borin (hereinafter, "Trey") suffered an on-Table encephalopathy and neurological sequelae (focal seizures) after receipt of his second DPT vaccination.

The undersigned held a hearing in this case on December 17, 2002. Testifying for petitioner were Dr. Roy D. Strand and Dr. Marcel Kinsbourne. Testifying for respondent were Dr. Robert A. Zimmerman and Dr. Samuel J. Horowitz.

Petitioner filed her closing argument on March 26, 2003. Respondent filed his post-hearing brief on April 24, 2003.

## FACTS

Trey was born on September 8, 1996. He received his first DPT on November 7, 1996 when he was two months old. Med. recs. at Ex. 3, p. 8.

On January 27, 1997, Trey went to the doctor with a history of having a cold for a couple of days with sneezing and watery eyes. He did not have a fever or cough. He had Tylenol for a day and was better. Med. recs. at Ex. 5, p. 9. He received his second DPT on January 29, 1997, when he was almost 5 months old. Med. recs. at Ex. 5, pp. 3, 10a.

Three days later, on February 1, 1997, Trey was taken to the Children's Hospital Medical Center Emergency Room with a history of four episodes of eyes rolling back and arms twitching, lasting 20 seconds to one minute. He had no fever. His temperature was 98.2° F. There was no clonic activity. Trey's parents reported that Trey was eating and acting normally between episodes. He did not have a history of illness or trauma. On physical examination, Trey was alert, well-appearing, and not in distress. Med. recs. at Ex. 4, p. 2. He was playful and interactive. Med. recs. at Ex. 4, p. 5.

The discharge summary, dated February 4, 1997, states that, several hours after receiving DPT, Trey had eye deviation upward and to the left. He did not have any fever or other symptoms at the time. He did not have cyanosis or apnea. On physical examination, he was alert and smiling.

He was within normal limits. His head CT scan showed some asymmetry in the frontal lobes. An EEG done on February 2, 1997 showed a right frontal focus of epileptiform activity. An MRI done on February 2, 1997 was normal. Med. recs. at Ex. 4, p. 6.

Examination of Trey showed him to be generally alert, smiling, cooing, and non-toxic. His anterior fontanelle was soft and flat. Neurologically, he pulled to sit, had good head control, bore weight on his legs with assistance, and had good tone. It was a non-focal examination. Med. recs. at Ex. 4, p. 13.

A neurological consultation on February 2, 1997 showed that Trey had had his second DPT two to three hours before the onset of symptoms but he did not have fever, irritability, or a decrease in oral feeding. The doctor doubted that there was a one to one correlation between DPT and Trey's seizure onset because of the absence of fever, mental status changes, irritability, or decreased oral intake. Med. recs. at Ex. 5, pp. 37, 38.

The February 2, 1997 CT scan of Trey's head showed a questionable area in the left sentrum semiovale and a slightly coarser gyral pattern on the right. Med. recs. at Ex. 5, p. 45.

Dr. Tracy A. Glauser on February 3, 1997 noted that Trey's CT scan showed mild asymmetry of the frontal lobe with a question of thickening of the right frontal cortex. Med. recs. at Ex. 5, p. 40.

Trey's February 3, 1997 MRI showed generalized decrease in the volume of white matter in his brain. The existing white matter demonstrated a normal myelination pattern for his age. There was a small pars intermedia cyst within the pituitary gland. His corpus callosum was somewhat thin and he had prominent extra-axial fluid spaces on the left. Med. recs. at Ex. 5, p. 41.

Noted on the April 11, 1998 MRI was a change in personality and screaming. There was no significant change in size of the ventricles. Med. recs. at Ex. 5, p. 289.

On February 23, 1999, Dr. Colin Zadikoff, a pediatric neurologist, wrote that Trey used to have up to 200 seizures a day. He now had two to three seizures a week. He was developmentally normal until he was about 14 months of age. He lost his ability to do anything. Med. recs. at Ex. 6, p. 1.

An EEG done on March 2, 1999 was abnormal, with slowing of the left hemisphere and associated spike discharges suggestive of neuronal dysfunction involving the left hemisphere and potentially epileptogenic. Med. recs. at Ex. 6, p. 3.

**Submissions**

Petitioner filed "Partial Seizures Evolving to Infantile Spasms" by N. Yamamoto, et al., 29 *Epilepsia* 1:34040 (1988). P. Ex. 13A. The authors describe four patients who had partial seizures that evolved to infantile spasms. They state that "all of our patients had underlying disorders in which brainstem abnormalities were suspected." Id. at 36.

Petitioner filed the "The National Childhood Encephalopathy Study," in *Whooping Cough: Reports from the Committee on Safety of Medicine and the Joint Committee on Vaccination and Immunization*, R. Alderslade, et al. (Department of Health and Social Security, London: Her Majesty's Stationery Office, 1981), pp. 79-183 (hereinafter, "NCES"). P. Ex. 13B. The researchers used a case-control approach rather than the preferred cohort approach because the former was simpler and faster. They suggest interpreting their results with caution. Id. at 97.

The NCES included in its grouping of individuals with higher risk during seven days following DPT immunization those who had a convulsion lasting more than 30 minutes who were

hospitalized. It occurred to the researchers that someone might have a brief convulsion or brief series of convulsions followed, months later, by a prolonged convulsion. Should that child be admitted to the study? The researchers decided that if the brief convulsions were related to the prolonged convulsion months later, he or she would become part of the study:

> It can be postulated that in some cases a particular dose of vaccine might be followed by one or more short convulsions and then, some months later, a prolonged or complicated convulsion might lead to admission to hospital (which should have prompted notification to the Study). It could be argued that the immunization "triggered" a series of events leading much later to a serious convulsion, and perhaps to brain damage. However, our analysis, which was arbitrarily confined to comparing a history of immunization during the 28 days before admission or onset of illnesses in cases with that in controls, would not include these cases and so might fail to show a true positive relative risk. It could equally well be argued that such children might have had a lower than usual threshold for convulsions in response to a variety of stimuli. The immunization might be considered to be "responsible" for the first short convulsion, but should not be held to account for later convulsions which could have occurred in response to fever or other stimuli. Further, any later brain damage could be regarded as a co-incidental result of the episode of prolonged convulsions, in which case responsibility for neither event should be ascribed to the long preceding immunization.
>
> We attempted, therefore, to determined [sic] whether or not such cases, which could have been regarded as "vaccine-associated", occurred and included them in our analysis. In every case (including those notified after severe convulsions) an enquiry was made into whether the child had had any earlier convulsion. When a series of fits appeared to be part of a single pathological process, as in cases with progressive mental deterioration, for the purpose of the Study the *date of onset of illness* was taken to be the *date of the first convulsion*. However, where a child had a series of convulsions *without* any obvious and continuing underlying clinical or pathological explanation, the date of onset of that child's illness was regarded as the date of the major convulsion for which the child was admitted to hospital and notified to the Study. The preceding convulsions in these cases were regarded as part of the previous medical history.
>
> Thus children in the former group were included amongst our count of "vaccine-associated" cases, but those in the latter group would have been omitted. It is among these children that the thread of causality linking the initial immunization and later serious convulsions is at its most tenuous.[1]

---

[1] Trey did not have a serious prolonged convulsion months after his onset of brief

(continued...)

Id. at 146-47.

A convenient summary of the NCES follows:

> The National Childhood Encephalopathy Study, conducted from 1976 to 1979, examined whether the frequency of vaccination in children with encephalopathy was greater than expected. It compared children aged 2 months to 3 years admitted to a hospital for serious acute neurological disease with a control group of normal children. Based on 11 subjects who appeared to have residua 18 months later, it was estimated that acute encephalopathy with permanent brain damage occurred at the widely quoted rate of 1 per 310,000 doses, with a 95% confidence interval (CI) of 1 in 54,000 to 5,310,000 doses. However, 4 among the 11 with apparent residua had infantile spasms and were subsequently eliminated from consideration when this condition was shown to be unrelated to DTP. Based on the data for the remaining 7 subjects, the relative risk for permanent impairment was 4.7 (95% CI, 1.1-28.0), with an attributable risk of 1 per 330,000 doses (95% CI, 1 case/50,000-18,000,000 doses). However, of these seven children, two had disseminated viral infections and one had Reye syndrome, conditions that are unlikely to be related to inoculation with DTP. In addition, three of the remaining four did not appear to be neurologically impaired on subsequent examination.

"Pertussis Vaccine," by K.M. Edwards, et al., ch. 14 of Vaccines, 3d ed., ed. S.A. Plotkin and W.A. Orenstein (1999), at 309. R. Ex. G. The authors, at Table 14-2, quote the "Institute of Medicine Conclusions Regarding the Causation of Serious Adverse Events by DTP," that evidence does not indicate that DPT causes afebrile seizures. Id. at 310.

As stated above, the NCES whittled down to four the total number of children whose onset of illness was within 7 days of receiving DPT, and three of those did not have permanent injuries. Among this selected group of vaccinees were two with prolonged/febrile convulsions. It is unclear if the slant between "prolonged" and "febrile" means "or" or "and." But, since the NCES included

---

[1](...continued)
seizures. Thus, he would not have been included in the NCES. This excerpt establishes that only in the situation of linking initial brief seizures with a serious prolonged convulsion would the NCES include a child. The NCES did not "add up" one- or two-minute seizures to total more than 30 minutes in order to admit a child to the Study, in contrast to Dr. Kinsbourne's testimony.

children with only a prolonged convulsion (i.e., more than 30 minutes), one would assume that the slant between "prolonged" and "febrile" means both and not in the alternative. If the NCES had included children with an afebrile, prolonged convulsion, the authors would have just referred to the convulsions as prolonged and not identified them as febrile. Most certainly, the authors did not include children with a short convulsion except for those who had a prolonged convulsion months later, whose initial brief convulsions were linked medically to their subsequent prolonged convulsion. One cannot conclude that the NCES supports the idea that DPT causes afebrile prolonged convulsions.[2] One certainly cannot conclude that the NCES supports the idea that DPT causes afebrile brief convulsions such as Trey had.

Petitioner filed Adverse Effects of Pertussis and Rubella Vaccines, Institute of Medicine (IOM) (1991). P. Ex. 13C. The IOM, reviewing the medical literature, states that "even pooling of the available data provides no evidence of a statistically significant increase in the risk of afebrile seizures following DPT vaccination." Id. at 115.

Petitioner filed DPT Vaccine and Chronic Nervous System Dysfunction: A New Analysis, by K.R. Stratton, et al., IOM (1994) (prepublication copy). P. Ex. 13D. The study was based on the NCES data and 10-year follow-up. Id. at 2. The authors reiterate the IOM's 1991 conclusion that "the evidence did not indicate a causal relationship between DPT and afebrile seizures." Id. at 3.

Petitioner filed "Nature and Rates of Adverse Reactions Associated with DTP and DT Immunizations in Infants and Children," by C.L. Cody, et al., 68 *Ped* 5:650-60 (1981). P. Ex. 16. Among 15,752 DPT immunizations given from Jan. 1, 1978 to Dec. 15, 1979, there were nine

[2] See Table V.23 (pp. 133-34; text on 138-39) listing Category 1 B (normal-abnormal) which includes two children with prolonged/febrile convulsions occurring within 7 days of DPT vaccination. Of course, one must note that Trey did not have prolonged convulsions.

children with convulsions, two of whom did not have fever. Eight of the children had normal neurological examinations. All nine of these children were either fussy or irritable, or had other unusual behavior with their seizure activity. All of them returned to a normal state of activity within 48 hours.[3] Id. at 653. The authors conclude that "simple convulsion, especially febrile convulsions following DTP immunization, are not followed by neurologic sequelae in the majority of cases." Id. at 656.

Petitioner filed Sixth International Symposium on Pertussis. Abstracts and Programs, Department of Health and Human Services (1990), followed by "The National Childhood Encephalopathy Study: A 10-Year Followup" by N. Madge, et al., and "The National Childhood Encephalopathy Study (NCES). A Ten Year Follow-up" by N. Madge, et al.,[4] and "Severe Neurological Illness: Further Analyses of the British National Childhood Encephalopathy Study" by D. Miller, et al., 13 *Tokai J Exp Clin Med Suppl* 143-55 (1988). P. Ex. 17.

In "The National Childhood Encephalopathy Study: A 10-Year Followup," the authors state that, in the NCES, "the number of vaccine-associated cases was too small and the followup period was too short to allow firm conclusions about the risk of permanent deficits following immunization." Id. at 226. The authors contacted case and control children, including those with infantile spasms and afebrile seizures, to determine neurologic sequelae among all the children reached, not just those included in the NCES 7-day period. Id. at 226-27.

---

[3] Trey was not fussy or irritable and did not have other unusual behavior with his seizure activity; he continued seizing, although he was developmentally normal until 14 months of age.

[4] This is published in *Develop Med and Child Neur Suppl No. 68*, Vol. 35, No. 7 (1993).

In answering a criticism that the NCES did not include children with seizures of less than 30 minutes duration, the authors in the *Tokai J Exp Clin Med Suppl* at 146 state they did include them, referring to Table 1 on the same page. But the only convulsions less than 30 minutes listed in Table 1 are infantile spasms, which the NCES excluded in its conclusion of higher risk because the data did not support any causal link between DPT and infantile spasms. The authors mention on the same page that the NCES did not assess causality in individual cases. At 153, they state:

> The number of previously apparently normal children who had a vaccine-associated illness and whose clinical condition and development were assessed was very small and, therefore, particularly vulnerable both to the effects of chance and to error or bias. Any conclusions based on such small numbers *must be extremely cautious*.

The authors conclude, at 154, that the NCES suggests but does not prove that DPT can cause serious acute neurological illnesses.

Petitioner filed "Recurrent Seizures After Diphtheria, Tetanus, and Pertussis Vaccine Immunization. Onset Less Than 24 Hours After Vaccination" by J.V. Murphy, et al., 138 *AJDC* 908-11 (1984). P. Ex. 26. The authors state, "The lack of control subjects makes it difficult to ascribe a causal relationship to pertussis vaccine." Id. at 910.

Petitioner filed an excerpt from chapter 7 of Child Neurology, 6th ed., ed. J.H. Menkes and H.B. Sarnat, p. 679, in which the author states that approximately 10% of children who seize within 48 hours of DPT do not have fever. P. Ex. 27.

Petitioner filed "Pertussis immunisation and serious acute neurological illnesses in children" by D. Miller, et al., 307 *BMJ* 1171-76 (1993), which analyzed all the cases reported to the NCES, including cases, such as infantile spasms, that the NCES excluded from its conclusions. The authors' goal was to determine if children with severe acute neurological illness following DPT had

permanent sequelae. The authors concluded that they did. Thus, children with both afebrile and febrile convulsions can have lasting sequelae. The authors did not conclude that DPT causes afebrile seizures or infantile spasms. Id. at 1175. P. Ex. 28.

Petitioner filed "Workshop on Neurologic Complications of Pertussis and Pertussis Vaccination" by J.H. Menkes and M. Kinsbourne, 21 *Neuropediatrics* 171-76 (1990). P. Ex. 30. The authors state that the majority of seizures following DPT vaccination are associated with fever. Id. at 171. In explaining how pertussis toxin could cross the blood-brain barrier in order to affect the brain, the authors state "factors known to disrupt the blood-brain barrier include brief hypertensive episodes such as might occur during a coughing paroxysm, hypoxia, and prolonged seizures, whether or not they are accompanied by hypoxia. In addition, a direct, endotoxin-mediated attack on the endothelial cells could create a local defect of the blood-brain barrier."[5] Id.

Describing neurological vaccine injuries, Drs. Kinsbourne and Menkes state:

> Seizures tended to assume the form of convulsive status epilepticus or of severe myoclonic epilepsy. This entity, which is usually seen unrelated to DPT vaccination, has its onset with uni- or bi-lateral clonic seizures in a setting of fever, which often is low grade.

Id. at 173.

Respondent filed Adverse Effects of Pertussis and Rubella Vaccines, IOM (1991), pp. 114-19, concluding that there is no statistically significant increase in the risk of afebrile seizures following DPT.

[5] Trey did not experience coughing paroxysm, hypoxia, or prolonged seizures.

## TESTIMONY

Dr. Roy Strand, a pediatric neuroradiologist who is now retired, testified first for petitioner. Tr. at 5. He is board-certified in radiology but did not take the boards in neuroradiology. Tr. at 7. He reviewed Trey's CT scan of November 8, 1998 and MRIs of February 1997 and February 1998. Tr. at 10. His opinion is that none of these studies is abnormal. Tr. at 11. Trey does not have periventricular leukomalacia or structural abnormalities. Id.

Dr. Strand reviewed respondent's expert Dr. Horwitz's report that the February 3, 1997 MRI showed poor myelination of the white matter, and disagreed, saying it was quite consistent with the myelination of someone five months old. Tr. at 12. Myelination is a matter of maturation. Id. The splenium, corpus callosum, and lateral ventricles were well within normal limits to Dr. Strand. Tr. at 12-13. Even the decrease of volume of white matter was within normal limits. Tr. at 13. Having a cyst was okay. Tr. at 14.

Dr. Strand agrees with respondent's expert Dr. Zimmerman that there was no acute insult to Trey's brain. Tr. at 15. He also agrees that there was some decrease in the white matter. Id.

Dr. Marcel Kinsbourne, a retired pediatric neurologist, testified next for petitioner. He has not seen pediatric neurology patients for 20 years. Tr. at 80-81. He supervises graduate students now. Tr. at 25. When Trey was born, he had fetal bradycardia, which is temporary stress due to a lower level of oxygen. Tr. at 24-25. Within hours of his DPT vaccine, Trey had staring spells which were the onset of his seizure disorder. Tr. at 33. He looked to the left and was unresponsive for one minute. Id. In a day or two, Trey had clenched fists and clearer epileptic activity. Tr. at 34. He had left tonic-clonic focal seizures which increased over a number of days. Id. On the third day after receiving DPT vaccine, Trey was taken to the hospital. Id. He kept seizing. Id.

Two weeks later, Trey's seizures became infantile spasms. Tr. at 35. He developed a complex partial seizure disorder which continues. Id. Dr. Kinsbourne testified that DPT is the cause of Trey's seizures. Tr. at 36. There was no other apparent cause beside the DPT. Id. Each seizure lasted one to two minutes and, if Dr. Kinsbourne were to add them up over the first week, they would exceed the 30 minutes required to have permitted Trey to be included in the National Childhood Encephalopathy Study (NCES). Id. According to Dr. Kinsbourne, the NCES does not distinguish between febrile and afebrile seizures in its conclusion. Tr. at 37-38.

In 1990, Dr. Kinsbourne led a workshop with Dr. John Menkes. Tr. at 60-61. When pertussis toxin causes brain dysfunction, it binds to the G proteins, inactivates them, cuts off inhibitory signals, and increases activation of neurons which fire excessively. Tr. at 61-62. Dr. Kinsbourne stated that he was not testifying that Trey had an acute encephalopathy. Tr. at 78, 81. He agrees that DPT does not cause infantile spasms. Tr. at 84.

Dr. Robert A. Zimmerman, a pediatric neuroradiologist, testified for respondent. He is board-certified in radiology and in neuroradiology. Tr. at 89. He has read 50,000 MRIs and consulted on 3,600 MRIs. Id. He reviewed Trey's February 3, 1997 MRI, February 24, 1998 MRI, and April 11, 1998 CT scan. Tr. at 90. In Dr. Zimmerman's opinion, Trey's February 3, 1997 MRI is abnormal. Id. His frontal horns and lateral ventricles are abnormally enlarged. Trey did not experience an acute insult to his brain. Tr. at 90-91.

There is also no evidence that Trey's blood-brain barrier was breached. Id. If it had been, one would see leakage of fluid and focal areas of increased density on MRI. Tr. at 91. Trey's brain shows no leakage in the cortex and no abnormality. Id. Trey's first MRI showed a problem that was either developmental (more likely) or removed tissue. Tr. at 93-94. His second MRI one year later

showed larger lateral ventricles because of the diminution of surrounding tissue. Tr. at 96. His parieto-occipital region was low in white matter. Id. This change indicates an ongoing brain process which Dr. Zimmerman could not identify. Tr. at 97. Pyrodoxine (vitamin B6) insufficiency can produce this as well as metabolic or genetic problems. Id. Dr. Zimmerman trained with Dr. Glauser, whom Trey saw. Tr. at 103. Dr. Zimmerman testified that Dr. Glauser is a good pediatric neurologist.

Dr. Samuel J. Horwitz, a pediatric neurologist, testified next for respondent. He retired from full-time practice four years ago. Tr. at 106. He is board-certified in pediatrics and in neurology with a specialty in child neurology. Id. He testified that DPT did not cause Trey's seizures. Tr. at 107. He also did not have an acute encephalopathy. Id. He did not have any alteration of consciousness or prolonged seizures. Tr. at 107-8. He had no neurological deficit to indicate an acute encephalopathy. Tr. at 108. He considers Dr. Glauser to be outstanding and Dr. Glauser did not link Trey's seizures to DPT. Id.

Trey had infantile spasms in mid-February 1997. Tr. at 109. This is a serious disorder with a very poor prognosis. Id. Dr. Horwitz stated that DPT can precipitate afebrile seizures in children who have an underlying brain disease or a low seizure threshold due to medication, antihistamines or phenothiazine, or alcohol. Tr. at 111. Music, flashing lights, smells, and any chemical substance can precipitate a seizure in a susceptible person. Tr. at 111-12. Dr. Horwitz thinks Trey was susceptible because there was something already wrong in his brain. Tr. at 112. But he does not know what the specific disorder is. Tr. at 125. DPT and a myriad of different agents could precipitate seizures in a susceptible individual. Id. The undersigned asked Dr. Horwitz if Trey's second DPT was a substantial factor in causing his seizures. Tr. at 127. Dr. Horwitz responded that

DPT was a "precipitating effect of causing the seizure on that day, but ...it would have happened any way and did not do any damage.... It just unmasked what was going to happen anyway." Tr. at 127.

The reason Dr. Horwitz gave for DPT not causing Trey any damage is that he did not have an acute encephalopathy without which damage from DPT is impossible. Id. The basis for Dr. Horwitz's opinion that DPT precipitated Trey's onset of seizures is the temporal relationship. Tr. at 129-30.

Dr. Horwitz disagreed with Dr. Kinsbourne's adding up Trey's one- to two-minute seizures to total 30 minutes in the first week after DPT. Tr. at 117. The only time someone would add up seizures is if someone has impaired consciousness between them. Tr. at 116. But Trey was normal between his seizures.

Dr. Horwitz stated that if Trey had never received DPT he would have had seizures. Tr. at 135. On January 27, 1997, the medical records state that Trey had had a cold for a couple of days and was sneezy with watery eyes. Tr. at 136-37. It is possible that the cold, medication (Tylenol) for the cold, or the DPT could have precipitated the seizures. Tr. at 138. Or it could have been coincidental. Id.

**DISCUSSION**

Petitioner has two options under the Vaccine Program: (1) to proceed under a theory of a Table injury or (2) to proceed on a causation in fact theory. The undersigned assumes petitioner opts for both, i.e., a Table encephalopathy and, in the alternative, causation-in-fact afebrile seizures because she alleged a Table encephalopathy in her petition even though her expert Dr. Kinsbourne stated Trey did not have an acute encephalopathy.

The Vaccine Act, as modified by regulation, defines a Table encephalopathy. 42 U.S.C. § 300aa-14, as modified by 42 CFR § 100.3(b)(2)(I)(A), states:

> *For children less than 18 months of age....* Those children less than 18 months of age who present following a seizure shall be viewed as having an acute encephalopathy if their significantly decreased level of consciousness persists beyond 24 hours and cannot be attributed to a postictal state (seizure or medication).

Section 100.3(b)(2)(i)(D) states:

> A "significantly decreased level of consciousness" is indicated by the presence of at least one of the following clinical signs for at least 24 hours or greater....:
>
> (1) Decreased or absent response to environment (responds, if at all, only to loud voice or painful stimuli);
>
> (2) Decreased or absent eye contact (does not fix gaze upon family members or other individuals); or
>
> (3) Inconsistent or absent responses to external stimuli (does not recognize familiar people or things).

Section 100.3(b)(2)(i)(E) states:

> Seizures in themselves are not sufficient to constitute a diagnosis of encephalopathy. In the absence of other evidence of an acute encephalopathy, seizures shall not be viewed as the first symptom or manifestation of the onset of an acute encephalopathy.

The earliest medical records contain the history from Trey's parents that Trey's only symptom following his second DPT vaccination was seizures. He did not have any fever, illness, cyanosis, or apnea. He acted normally between episodes and was eating. On physical examination in the hospital, he was alert, well-appearing, non-toxic, in no distress, playful, interactive, smiling, and cooing. A child with no symptoms other than seizures who is alert, well-appearing, non-toxic, behaving normally, playful, interactive, smiling, and cooing does not have an acute encephalopathy, either Table or non-Table.

Petitioner has not presented a prima facie case of a Table encephalopathy.

That leaves petitioner with the burden of proving that DPT caused in fact Trey's afebrile seizures. To satisfy her burden of proving causation in fact, petitioner must offer "proof of a logical sequence of cause and effect showing that the vaccination was the reason for the injury. A reputable medical or scientific explanation must support this logical sequence of cause and effect." Grant v. Secretary, HHS, 956 F.2d 1144, 1148 (Fed. Cir. 1992). Agarwsal v. Secretary, HHS, 33 Fed. Cl. 482, 487 (1995); see also Knudsen v. Secretary, HHS, 35 F.3d 543, 548 (Fed. Cir. 1994); Daubert v. Merrell Dow Pharmaceuticals, Inc., 509 U.S. 579 (1993).

Without more, "evidence showing an absence of other causes does not meet petitioners' affirmative duty to show actual or legal causation." Grant, supra, 956 F.2d at 1149. Mere temporal association is not sufficient to prove causation in fact. Hasler v. US, 718 F.2d 202, 205 (6th Cir. 1983), cert. denied, 469 U.S. 817 (1984).

Petitioner must not only show that but for the DPT vaccine, Trey would not have had the injury, but also that the vaccine was a substantial factor in bringing about his injury. Shyface v. Secretary, HHS, 165 F.3d 1344 (Fed. Cir. 1999).

Petitioner, in her Closing Argument, filed March 23, 2003, states at p. 17 that none of the experts dispute that Trey's second DPT caused his seizure disorder and mental retardation. She posits that the only remaining issues are whether there is a biological mechanism and whether other causes have been ruled out. The undersigned does not agree that these are the issues in the case. The neuroradiological expert testimony adhered solely to interpreting the two MRIs and the CT scan. The pediatric neurologic testimony conflicted as to causation. Dr. Kinsbourne testified in the affirmative. Dr. Horwitz flitted about. First, he testified that DPT unmasked or precipitated Trey's

seizures because he has an unknown preexisting brain disorder. When pressed for the basis for his opinion, he conceded that it was the temporal relationship and it could have been coincidental. Thus, petitioner's case rests solely upon the testimony of Dr. Kinsbourne. One might note that Dr. Kinsbourne opined that Trey was healthy before his second DPT, not that he had a preexisting brain injury. Thus the predicate (a preexisting brain disorder) for Dr. Horwitz's opinion about DPT being an unmasking or precipitating factor (ignoring the temporal aspect for the moment) is missing if one accepts Dr. Kinsbourne's testimony.

Petitioner also states in her Closing Argument that at issue is her proof of a biological mechanism. But, the Federal Circuit, in Knudsen, supra, stated that the special master need not identify a biological mechanism:

> Furthermore, to require identification and proof of specific biological mechanisms would be inconsistent with the purpose and nature of the vaccine compensation program. The Vaccine Act does not contemplate full blown tort litigation in the Court of Federal Claims. The Vaccine Act established a federal "compensation program" under which awards are to be "made to vaccine-injured persons quickly, easily, and with certainty and generosity." House Report 99-908, *supra*, at 3, 1986 U.S.C.C.A.N. at 6344.
>
> The Court of Federal Claims is therefore not to be seen as a vehicle for ascertaining precisely how and why DTP and other vaccines sometimes destroy the health and lives of certain children while safely immunizing most others.

35 F.3d at 549.

Petitioner lastly states in her Closing Argument that at issue is whether other causes have been ruled out. Even though Dr. Horwitz initially testified that there were tests that Dr. Glauser could have performed but did not which might have shown other causes, he backtracked and said he would not have done differently if he were the treating pediatric neurologist. The medical records

clearly state that other causes were ruled out. The cause of Trey's seizures remains unknown and other causes are not an issue here.

Thus, petitioner's case rests solely on the credibility of the basis for Dr. Kinsbourne's opinion that DPT caused Trey's seizures. His credibility is undercut by the testimony of the expert neuroradiologists Dr. Strand and Dr. Zimmerman that Trey's MRIs and CT scan show that Trey did not suffer an acute insult to his brain.

Dr. Kinsbourne relied heavily on the NCES to support his testimony that DPT caused Trey's seizures because the researchers in that epidemiological study performed in England decades ago found an increased incidence of serious acute neurologic illness, basically encephalopathy and convulsions lasting more than 30 minutes, during seven days following DPT vaccination. However, because their group of afflicted individuals was so small and the populace from which they came so large, the authors of the NCES admitted that the confidence intervals were larger than they would have liked.

Since Trey did not have an acute encephalopathy, Dr. Kinsbourne's testimony that he would have been included in the afflicted group rests solely on his seizures. But, the NCES seizure group included only those children with a convulsion lasting 30 minutes or more. Dr. Kinsbourne added up all of Trey's one- to two-minute seizures over seven days to arrive at 30 minutes and then concluded Trey would have been admitted to the NCES. There is no substantiation in the NCES for Dr. Kinsbourne's legerdemain. If a child had more than a thirty-minute seizure months after the first week following DPT vaccination, and a brief seizure during the week after vaccination, the NCES researchers would attempt to determine if the brief seizure and the later more than 30-minute seizure

were related. If so, they would include the child in the study. But there is no child included in the NCES analysis who had one- or two-minute seizures and no 30-minute seizure.

Even if, arguendo, Trey would have been included in the NCES, the NCES does not support a conclusion that DPT causes afebrile seizures. The researchers included children with "prolonged/febrile convulsions." Under no stretch of the imagination can Trey be said to have had prolonged/febrile convulsions. Thus, the first basis for Dr. Kinsbourne's opinion of causation–that Trey would have been included in the NCES and the NCES supports the notion that DPT causes afebrile seizures–is invalid for two reasons: (1) Trey's seizures would not have qualified him for inclusion since the NCES would not "add" them up to make one more than 30-minute seizure and he never had a more than 30-minute seizure months after the onset of his seizures, and (2) Trey does not fit within the NCES' inclusion of two individuals with prolonged, febrile seizures since his seizures were neither prolonged nor febrile.

The second basis for Dr. Kinsbourne's opinion of causation is pathological theory. He testified that something in the pertussis vaccine penetrates the baby's blood-brain barrier, permitting pertussis toxin to injure G proteins, causing neuronal dysfunction. This is pure speculation, emerging from a workshop that Dr. Kinsbourne and Dr. Menkes co-chaired. This workshop, though published, is clearly not a peer-reviewed article but a recital of what happened during the discussion with lots of theories posited about possible reasons for causation.

In this workshop, Dr. Kinsbourne and Dr. Menkes stated that seizures might result if the vaccine penetrated the blood-brain barrier, which could occur if there were coughing paroxysm, hypoxia, or prolonged seizures, none of which Trey had. Or, they stated, perhaps endotoxin in the vaccine permeates the blood-brain barrier microscopically (so an MRI would not detect it). Yet,

Trey was asymptomatic except for his brief seizures: he acted normally, fed normally, was happy, active, playing, cooing, and smiling. An attack on Trey's brain through this supposed process of microscopic penetration by endotoxin while, at the same time, not causing an acute brain insult (according to Drs. Strand and Zimmerman) is not credible. Moreover, Dr. Zimmerman testified that a breach of the blood-brain barrier would appear on MRI as leakage of fluid and focal areas of increased density. Trey's MRIs did not show this.

The undersigned does not find plausible that DPT would, in the absence of acute encephalopathy and/or fever, cause brief seizures when the child is otherwise normal. This accords with the opinion of Trey's treating neurologist during Trey's initial hospitalization. He wrote in his records on February 2, 1997 that he did not believe DPT caused Trey's seizures because Trey did not have fever, mental status changes, irritability, or decreased oral intake. The undersigned does not accept Dr. Kinsbourne's second basis for his opinion of causation–a microscopic penetration of Trey's brain by DPT endotoxin caused his seizures without causing any other symptoms

Dr. Horwitz, respondent's pediatric neurologic expert, opined that DPT unmasked a seizure disorder that would have happened anyway, but he based his opinion on the temporal association of the DPT and the onset of seizures hours later. Legally, a temporal association by itself is insufficient to prove causation. See Hasler, supra.

The undersigned has held repeatedly that DPT does not cause afebrile seizures, based on the NCES, the IOM, and other literature. See Bruesewitz v. Secretary of HHS, No. 95-0266V, 2002 WL 31965744 (Fed. Cl. Spec. Mstr. Dec. 20, 2002); Clements v. Secretary of HHS, No. 95-484V, 1998 WL 481881 (Fed. Cl. Spec. Mstr. July 30, 1998); O'Connell v. Secretary of HHS, No. 96-63V, 1998 WL 64185 (Fed. Cl. Spec. Mstr. Feb. 2, 1998), aff'd, 40 Fed. Cl. 891 (1998), aff'd by unpub.

opinion, No. 98-5134 (Fed. Cir., Nov. 1, 1999); and Haim v. Secretary of HHS, No. 90-1031V, 1993 WL 346392 (Fed. Cl. Spec. Mstr. Aug. 27, 1993). The IOM also concluded that DPT does not cause afebrile seizures. Adverse Effects of Pertussis and Rubella Vaccines (1991). The IOM did a meta-analysis of febrile and afebrile seizures and concluded that "even pooling available data provides no evidence of a statistically significant increase in the risk of afebrile seizures following DPT vaccination." Id. at 115.

It is an unhappy situation not to have an answer for petitioner as to why Trey is afflicted with seizures, but focusing on DPT merely because it preceded Trey's seizure onset is not legally sufficient to prove causation. Petitioner has not presented a prima facie case that DPT caused Trey's afebrile seizures.

**CONCLUSION**

Petitioner's petition is dismissed with prejudice. In the absence of a motion for review filed pursuant to RCFC Appendix B, the clerk of the court is directed to enter judgment in accordance herewith.

**IT IS SO ORDERED.**

_____ _____

DATE Laura D. Millman
Special Master