In the United States Court of Federal Claims

No. 02-1314V
Filed: May 5, 2017

BRUCE ANDERSON and DONNA ANDERSON, as parents of R.A., a minor Petitioners, v. SECRETARY OF HEALTH AND HUMAN SERVICES, Respondent.	Autism Spectrum Disorder; Measles-Mumps Rubella Vaccine; Mitochondrial Disease; Vaccine Act, 42 U.S.C. §§ 300aa-1 to -34; Vaccine Rules of the United States Court of Federal Claims ("Vaccine Rules") 23, 27.

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MEMORANDUM OPINION AND FINAL ORDER

BRADEN, *Chief Judge.*

Petitioners request review of the Special Master's November 1, 2016 Decision denying an award under the Vaccine Act.[1]

I. RELEVANT FACTUAL BACKGROUND.[2]

On December 10, 1998, R.A. was born to Donna and Bruce Anderson. 11/1/16 Dec. at 2. Approximately two weeks later, R.A. was assessed as a well-child during an early pediatric visit.

[1] The applicable statutory provisions of the Vaccine Act are codified at 42 U.S.C. §§ 300aa-1 to -34 (2012).

[2] The relevant facts were derived from: the transcript of the hearing convened by the Special Master from December 8–9, 2015 ("12/8/15 TR at 1–406"), and the Special Master's November 1, 2016 Decision denying compensation, *see Anderson v. Sec'y of Health & Human*

11/1/16 Dec. at 2. During R.A.'s first year of life, he received routine childhood immunizations, following a vaccination schedule established by his pediatrician. 11/1/16 Dec. at 2. No growth or developmental concerns were noted. 11/1/16 Dec. at 3.

On December 13, 1999, R.A. received his first measles-mumps-rubella ("MMR")[3] and Varicella vaccinations.[4] 11/1/16 Dec. at 3. Six days later, on December 19, 1999, R.A.'s mother called the pediatrician to report that R.A. had a high fever and was slightly congested. 11/1/16 Dec. at 3. On December 20, 1999, R.A. was examined by his pediatrician. 11/1/16 Dec. at 3. During that visit, the Andersons reported that R.A. had been suffering from a runny nose for several days, followed by a high fever during the past day. 11/1/16 Dec. at 3. R.A.'s temperature was recorded as 101.6 degrees Fahrenheit ("º F"); he was alert, awake, but had clear rhinorrhea[5] and nasal congestion. 11/1/16 Dec. at 3. R.A.'s pediatrician diagnosed him with a viral syndrome/viral upper respiratory infection. 11/1/16 Dec. at 3.

On that same day, R.A. was taken to an emergency room with a high fever recorded as 105.1º F. 11/1/16 Dec. at 3–4. The emergency room staff took blood cultures and started R.A. on an antibiotic, and R.A. was discharged on that day. 11/1/16 Dec. at 4.

On December 21, 1999, the Andersons took R.A. to his pediatrician, to follow up to the emergency room visit. 11/1/16 Dec. at 4. In the pediatrician's office, R.A. registered a 102.2º F fever, but he was described as awake and alert with clear rhinorrhea. 11/1/16 Dec. at 4. His pediatrician assessed R.A. with a probable viral illness. 11/1/16 Dec. at 4. On December 22, 1999, R.A.'s mother reported to his pediatrician that R.A.'s condition was improving and that he was

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Servs., No. 02-1314V, 2016 WL 82562278 (Fed. Cl. Spec. Mstr. Nov. 1, 2016), ECF No. 106 ("11/1/16 Dec.").

[3] The MMR vaccine is a "combination of live attenuated measles, mumps, and rubella viruses, administered subcutaneously for simultaneous immunization against measles, mumps, and rubella in persons 12 months of age or older." *See* DORLAND'S ILLUSTRATED MEDICAL DICTIONARY 2016 (32d ed. 2012) ("DORLAND'S") at 2016. Measles is a "highly contagious viral disease caused by a paramyxovirus." *See id*. at 1115. Although measles usually is benign, "complications may sometimes occur, including secondary bacterial infections, such as otitis media, pneumonia, or laryngitis." *See id*. at 1116.

Mumps is "an acute infectious disease caused by a paramyxovirus called mumps virus." *See id*. at 1188. "[T]he principal manifestation is parotitis, usually associated with painful swelling of one or both parotid glands and sometimes other salivary glands." *See id*.

Rubella is "an acute, usually benign, infectious disease caused by viruses of genus Rubivirus[.]" *See id*. at 1657.

[4] Varicella vaccine is a "live attenuated virus vaccine prepared from human herpesvirus 3 (varicella-zoster virus) [that is] administered subcutaneously." *See* DORLAND'S at 2017.

[5] Rhinorrhea is "the free discharge of a thin nasal mucus." *See* DORLAND'S at 1640.

eating and drinking well. 11/1/16 Dec. at 4. In January 2000, R.A. saw his pediatrician three times. 11/1/16 Dec. at 4. On January 20, 2000, R.A. had a cold for two days with pink, swollen eyes. 11/1/16 Dec. at 4. R.A.'s pediatrician diagnosed R.A. with conjunctivitis.[6] 11/1/16 Dec. at 4. On January 28, 2000, R.A. had a fever and was reported as clinging and fussy, with decreased appetite and bright red and white tonsils. 11/1/16 Dec. at 4. R.A. was diagnosed with exudative[7] tonsillitis. 11/1/16 Dec. at 4. On January 30, 2000, R.A. also had a red area at the base of his penis that his pediatrician diagnosed as a probable penile adhesion due to pulling.[8] 11/1/16 Dec. at 4.

On March 3, 2000, R.A. visited his pediatrician with a fever and sore throat, and was diagnosed with pharyngitis and a viral-like rash. 11/1/16 Dec. at 4. On March 22, 2000, R.A. again saw his pediatrician for a fifteen month well-child visit where it was noted that R.A. was developing, walking well, and saying about five words. 11/1/16 Dec. at 4–5.

In June 2000, R.A. visited his pediatrician for an eighteen month well-child visit. 11/1/16 Dec. at 5. R.A. was described as a healthy eighteen-month old, however, two developmental concerns were noted: R.A. did not "really follow commands" and would not point out pictures in books. 11/1/16 Dec. at 5.

On September 11, 2000, R.A. visited his pediatrician for a twenty-one month well-child visit. 11/1/16 Dec. at 5. The pediatrician observed developmental concerns and recommended a speech and hearing evaluation. 11/1/16 Dec. at 5.

On December 6, 2000, R.A. visited his pediatrician for a two-year well-child visit. 11/1/16 Dec. at 5. Because R.A.'s developmental delays were more pronounced, his pediatrician recommended that R.A. have a genetic consultation. 11/1/16 Dec. at 6.

Starting in January 2001, R.A. was tested for behavioral, genetic, and biological issues. 11/1/16 Dec. at 6.

On January 11, 2001, R.A. was evaluated by Laura Bailet, Ph.D., a neurocognitive specialist. 11/1/16 Dec. at 6. The Andersons informed Dr. Bailet that R.A.'s motor coordination was fair, but his language skills were poor. 11/1/16 Dec. at 6. Although R.A. spoke his first words,

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[6] Conjunctivitis is an "inflammation of the conjunctiva, generally consisting of conjunctival hyperemia associated with a discharge." *See* DORLAND'S at 405. The conjunctiva is "the delicate membrane that lines the eyelids and covers the exposed surface of the sclera[.]" *See id*.

[7] Exudation is the "escaping of fluid, cells, and cellular debris from blood vessels and their deposition in or on the tissues, usually as the result of inflammation." *See* DORLAND'S at 665. The adjective "exudative" refers to that process. *See id.*

[8] "Penile adhesions in circumcised boys occur when the penile shaft skin adheres to the glans of the penis." *See* Children's Hospital of Philadelphia, *Penile Adhesion* (2014), http://www.chop.edu/conditions-diseases/penile-adhesions.

prior to turning one, subsequently he experienced very slow language progression, *e.g.*, R.A. could say a few words, but mostly he babbled and pointed to things he wanted. 11/1/16 Dec. at 6. But, Dr. Bailet noted that "no history of frank language regression was reported." 11/1/16 Dec. at 6. On January 25, 2001, Dr. Bailet saw R.A. for a second evaluation when she concluded that R.A. evidenced developmental delays and mild behavioral characteristics that could be associated with autism. 11/1/16 Dec. at 6.

On January 31, 2001, R.A. also was evaluated by Dr. Daniel Shanks, a pediatric neurologist. 11/1/16 Dec. at 6. Dr. Shanks recorded that there was no evidence of developmental regression in R.A., as opposed to a more general failure to progress developmentally. 11/1/16 Dec. at 6. Dr. Shanks' examination of R.A. also revealed no significant difficulties with motor development, other than being clumsy and having loose joints. 11/1/16 Dec. at 6. Dr. Shanks diagnosed R.A. with static encephalopathy,[9] a communication disorder spectrum, and recommended genetic testing. 11/1/16 Dec. at 6–7.

On February 5, 2001, R.A. received a genetic evaluation from Dr. Pamela Arn that revealed normal chromosomes. 11/1/16 Dec. at 7. Dr. Arn noted that initially R.A.'s mother was concerned about R.A.'s development when he was fifteen months old, but R.A.'s motor milestones were normal, although his verbal skills were delayed. 11/1/16 Dec. at 7.

On April 12, 2001, R.A. was evaluated by Dr. Donald George, a gastroenterologist for dietary control that could affect behavior. 11/1/16 Dec. at 7. Dr. George noted that the Andersons became concerned about R.A.'s developmental delay in the fall of 2000 and R.A. began taking a wide variety of supplements and proprietary vitamins, based on recommendations from independent specialists that the Andersons consulted. 11/1/16 Dec. at 7.

On June 7, 2001, R.A. was evaluated by Dr. Karoly Horvath, a pediatric gastroenterologist who performed endoscopies, biopsies, and microbiologic analysis of R.A.'s body fluid cultures, but found no significant abnormalities or pathology. 11/1/16 Dec. at 7.

On November 12, 2001, R.A. was re-evaluated by Dr. Bailet. 11/1/16 Dec. at 7. At that time, R.A. was 25 months old. Dr. Bailet observed that R.A.'s language skills were at an 18-month level, but R.A. scored as moderate-to-severely autistic on the autism rating scale. 11/1/16 Dec. at 7.

[9] Static means "at rest; in equilibrium; not in motion." *See* DORLAND'S at 1767. Encephalopathy refers to "any degenerative disease of the brain." *See id*. at 614.

Beginning in 2001, R.A. started receiving treatment from Dr. Dan Rossignol and Dr. Jeffrey Bradstreet,[10] two "Defeat Autism Now" ("DAN!") doctors.[11] 11/1/16 Dec. at 8. They prescribed intravenous infusions of immunoglobulin, vitamin C, secretin, Solu-Medrol, and glutathione. 11/1/16 Dec. at 8.

In 2001, R.A. also periodically was tested for various markers of metabolic abnormalities, including ammonia, lactic acid, and liver enzymes aspartate transaminase and alanine transaminase. 11/1/16 Dec. at 9. Dr. Bradstreet was of the opinion that some of R.A.'s tests were significant, as they evidenced a low free and total carnitine,[12] increased lactate, and increased ammonia. 11/1/16 Dec. at 9–10. But, R.A.'s test results suggesting the existence of abnormal biochemical markers were inconsistent; other tests showed that R.A.'s free and total carnitine, lactate, and ammonia were normal. 11/1/16 Dec. at 10.

In May 2002, Dr. Bradstreet evaluated R.A. for a possible seizure disorder, and recorded an electroencephalogram ("EEG"),[13] that indicated episodes of 3-cycle spikes and waves lasting less than 1.5 seconds. 11/1/16 Dec. at 9. Thereafter, R.A. was diagnosed with "absence seizures."[14] 11/1/16 Dec. at 9.

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[10] Dr. Bradstreet was a practicing physician who proposed a causal link between the MMR vaccine and autism. *See, e.g., Hearing Before The Committee On Government Reform*, June 19, 2002, Serial No. 107-121, *available at* https://www.gpo.gov/fdsys/pkg/CHRG-107hhrg82358/html/CHRG-107hhrg82358.htm (site last visited February 13, 2017).

[11] In 2001, DAN! was composed of doctors and medical professionals who believed that autism could be caused by vaccines. *See* Lisa Jo Rudy, *What Was the DAN! (Defeat Autism Now) Protocol?*, VeryWell (Feb. 18, 2017), https://www.verywell.com/dan-defeat-autism-now-is-no-more-3971489. DAN! doctors "[were] trained to treat autism as a biomedical disorder caused by a combination of lowered immune response, external toxins from vaccines and other sources, and problems caused by certain foods." *See Biomedical Treatment for Autism Spectrum Disorders*, Autism Society, http://www.autismlarimer.org/biomedical.html (last visited February 14, 2017). Accordingly, DAN! doctors often recommended nutritional supplements, special diets, testing for hidden food allergies, treatment of intestinal yeast or bacterial overgrowth, and detoxification of heavy metals. *See id.*

[12] Carnitine is a "betaine derivative found in skeletal muscle and liver; it is required for mitochondrial beta oxidation of fatty acids, carrying the acyl group (fatty acids) across the mitochondrial membrane to the matrix, where they are transferred back to coenzyme A prior to oxidation . . . . Deficiency of carnitine leads to buildup of fatty acids in the body." *See* DORLAND'S at 297.

[13] An electroencephalogram is "a recording of the potentials on the skull generated by currents emanating spontaneously from nerve cells in the brain." *See* DORLAND'S at 600.

[14] Absence seizures are characterized by staring spells that last 1–10 seconds, and, unlike grand mal seizures, do no result in the subject falling to the ground. 11/1/16 Dec. at 9 fn. 9.

In 2003, R.A. began receiving care at Progressive Pediatrics, where he received regular intramuscular immunoglobulin from October 2003 until January 2005. 11/1/16 Dec. at 9. R.A. also received three weekly treatments in a hyperbaric chamber during the summer of 2005. 11/1/16 Dec. at 9. R.A. continued to receive care at Progressive Pediatrics until at least 2010. 11/1/16 Dec. at 9. From 2003 until 2010, R.A.'s diagnosis was "active autism."[15] 11/1/16 Dec. at 9.

On February 6, 2008, more than seven years after R.A. received the MMR vaccine, Dr. Bradstreet concluded that "[R.A.] suffered neurological, gastrointestinal, and immune system injuries and dysfunction as a result of encephalitis, chronic diarrhea, and inflammatory bowel disease (IBD***) from his [MMR] vaccination at 12 months of age***." 11/1/16 Dec. at 8 (bold and emphasis added). This is the first medical record that linked the MMR vaccine to R.A.'s autism diagnosis and placed the onset of his developmental symptoms at the time of vaccination. 11/1/16 Dec. at 8.

In 2008, R.A. was referred to Dr. John Shoffner, a specialist in mitochondrial disorders. 11/1/16 Dec. at 10. On July 22, 2008, Dr. Shoffner evaluated R.A. to determine whether his developmental limitations were attributable to a defect in cellular energetics or another type of metabolic disease. 11/1/16 Dec. at 10. Dr. Shoffner reviewed R.A.'s medical history and conducted a series of tests, including muscle biopsies and metabolic studies. 11/1/16 Dec. at 10. Thereafter, Dr. Shoffner diagnosed R.A. with a mitochondrial disease and renal tubule dysfunction.[16] 11/1/16 Dec. at 10. This diagnosis relied on the timing of R.A.'s developmental difficulties, including the fact that R.A. developed normally until his MMR vaccination at 12 months; but, after the vaccination, R.A. developed a high fever, but it was not associated with concurrent neurological changes. 11/1/16 Dec. at 10–11. In addition, R.A. received another vaccine at 16–17 months of age, that also was associated with a fever; and, by 17–18 months, R.A. experienced a regression of skills, including a loss of speech, motor skills, cognitive ability, and receptive/expressive speech. 11/1/16 Dec. at 11.[17] Dr. Shoffner also relied on numerous evaluations of metabolic marker tests, including free and total carnitine levels, lactose levels, and the concentration of amino acids in R.A.'s cerebral spinal fluid, blood plasma, and urine. 11/1/16 Dec. at 11. Although other tests were within normal range, R.A.'s urine showed elevations of multiple amino acids, including taurine, glutamine, and cysteine. 11/1/16 Dec. at 11. Based on

[15] During this period, R.A. received a significant number of medications and supplements, including: Gamunex immunoglobulin; Secreflo secretin; gluthathione and cysteine; Zyrtec; Spironolactone; Methyl-B12; Digest Right 1; Nordic Natural Cod Liver Oil; Probiotic Pearls; Ther-Biotic Complete; Nordic Natural ProEPA; calcium and magnesium tablets; Child Essence Multi-Vitamin; FolaPro; L-carnitine; Coenzyme Q10; Ester-C; taurine; zinc; Nasalcrom; and Ayr Saline. 11/1/16 Dec. at 9.

[16] The renal tubule is a portion of the nephron, "the anatomical and functional unit of the kidney." *See* DORLAND'S at 1241.

[17] Although Dr. Shoffner's diagnosis relied upon a regression of skills, no regression of skills was recounted in the pre-2008 medical records reviewed by the Special Master. 11/1/16 Dec. at 11.

the increased urine amino acids, Dr. Shoffner concluded that R.A. had a proximal renal tubule defect also causing a generalized aminoaciduria.[18] 11/1/16 Dec. at 11.

On July 22, 2008, Dr. Shoffner performed a biopsy of R.A.'s skeletal muscles to conduct enzymology tests. 11/1/16 Dec. at 11. Dr. Shoffner also assessed the functioning of mitochondria Complexes I through IV to determine the activity of the enzymes.[19] 11/1/16 Dec. at 11. One of two assays[20] evaluating Complex I suggested reduced enzyme activity. 11/1/16 Dec. at 12. The overall Complex I assay results, however, fell within the normal range to a 95 percent confidence interval. 11/1/16 Dec. at 12. Only one of the two assays evaluating Complex IV indicated reduced activity. 11/1/16 Dec. at 12. Dr. Shoffner's biopsy also showed a reduction in citrate synthase—an important enzyme marker in the mitochondria that provides a proxy measurement of mitochondrial content in the muscle. 11/1/16 Dec. at 12. Dr. Shoffner also examined R.A.'s muscle fibers, and observed a moderate size variation due to atrophy of R.A.'s Type II muscle fibers. 11/1/16 Dec. at 12. Dr. Shoffner's histochemical and immunochemical analyses, however, were unremarkable. 11/1/16 Dec. at 12.

Based on Dr. Shoffner's evaluation, R.A. was diagnosed with a "probable oxidative phosphorylation disease," a Complex I mitochondrial defect, and autism spectrum disorder with proximal renal tubule defect.[21] 11/1/16 Dec. at 12. Following the recommendation of Drs. Bradstreet and Shoffner, R.A.'s supplements were targeted to address mitochondrial function. 11/1/16 Dec. at 12.

On December 30, 2013, R.A. also was evaluated by Dr. Frances Kendall, a clinical biochemical geneticist. 11/1/16 Dec. at 12. Dr. Kendall determined that there were two mutations present in R.A. that have been linked to intellectual disability, neurodevelopmental disorders, and

[18] Aminoaciduria refers to an "excess of amino acid acids in the urine." *See* DORLAND'S at 61.

[19] The term "Complex I" describes a group of proteins in the mitochondria that are integral to the production of cellular energy. 11/1/16 Dec. at 12 n.17. "Typically, five protein complexes (referred to as Complex I–V) work in sequence in the mitochondria to produce cellular energy." 11/1/16 Dec. at 12 n.17.

[20] An assay is a "determination of the amount of a particular constituent of a mixture." DORLAND'S at 166.

[21] Oxidative phosphorylation is "the formation of high energy phosphate bonds by phosphorylation of the ADP to ATP coupled to transfer of electrons . . . via the electron transport chain." *See* DORLAND'S at 1439. The electron transport chain is a process that occurs within the inner mitochondrial membrane, and is associated with the production of the molecule adenosine triphosphate ("ATP") from adenosine diphosphate ("ADP") and phosphate. *See* DORLAND'S at 335. Phosphorylation is "the metabolic process of introducing a phosphate group into an organic molecule." *See* DORLAND'S at 1439.

autism. 11/1/16 Dec. at 12. Dr. Kendall, however, concluded that "it is purely speculative as to whether or not they are causative for [R.A.]." 11/1/16 Dec. at 12.

After Dr. Shoffner's evaluation, R.A.'s physical and mental development improved. 11/1/16 Dec. at 13. By December 2015, R.A. could maintain significant physical activity for 3–6 hours a day. 11/1/17 Dec. at 13. Although R.A.'s development improved with time, R.A.'s abstract thinking was not as advanced as others his own age. 11/1/16 Dec. at 12–13.

II. PROCEDURAL HISTORY.

A. The Omnibus Autism Proceedings.

On October 1, 2002, Donna Anderson and Bruce Anderson ("Petitioners"), on behalf of their son R.A., filed a Short-Form Petition for Vaccine Compensation under the National Childhood Vaccine Injury Act, 42 U.S.C. §§ 300aa-10 to -34 (the "Vaccine Act"). By filing a Short-Form Petition, Petitioners opted into the "Omnibus Autism Proceeding." ECF No. 3.

The Omnibus Autism Proceeding was a consolidated proceeding instituted by the United States Court of Federal Claims' Office of Special Masters to adjudicate the principal issues in the approximately 5,000 claims alleging a relationship between vaccines and autism spectrum disorder. Autism General Order #1, AUTISM MASTER FILE (Fed. Cl. Spec. Mstr. July 3, 2002) (establishing the Omnibus Autism Proceeding);[22] *see also Hazlehurst v. Sec'y of Health & Human Servs.*, 604 F.3d 1343, 1345 (Fed. Cir. 2010) (describing the purpose of the Omnibus Autism Proceeding). During the Omnibus Autism Proceeding, Petitioners were represented by a panel of attorneys known as the Petitioners' Steering Committee ("PSC"). Autism General Order #1 at 4, AUTISM MASTER FILE (Fed. Cl. Spec. Mstr. July 3, 2002).

On December 20, 2006, the PSC elected to pursue three separate theories of "general causation," regarding the relationship between vaccines and autism spectrum disorder. Autism Update-May 25, 2007 at 6, AUTISM MASTER FILE (Fed. Cl. Spec. Mstr. May 25, 2007). The first theory was that a combination of the MMR vaccine and thimerosal-containing vaccines[23]could cause autism. *Id.* at 6. The second theory was that thimerosal-containing vaccines, alone, could cause autism, and the third theory was that the MMR vaccine, alone, could cause autism. *Id.* at 6. The PSC elected to pursue the three "general causation" theories through individual "test cases." *Id.* at 6–7. Petitioners' case was selected as a "test case" for the third theory of "general causation," *i.e.*, that the MMR vaccine, alone, could cause autism. ECF No. 24.

[22] The Autism Master File constitutes the record of the Omnibus Autism Proceeding. The complete file is maintained by the Clerk of the United States Court of Federal Claims and is available for inspection. An electronic version of the file is maintained on the website of United States Court of Federal Claims at http://www.uscfc.uscourts.gov.

[23] Thimerosal is an "organomercurial antiseptic . . . used as a topical anti[-]infective and a preservative in pharmaceutical preparations." *See* DORLAND'S at 1918.

On January 26, 2007, Petitioners' case was assigned to Special Master Vowell.

But, on September 29, 2008, the PSC decided not to pursue the third theory of "general causation," because it was not significantly "distinct" from the first theory, *i.e.*, that the MMR vaccine and thimerosal-containing vaccines, together, could cause autism. Autism Update-September 29, 2008 at 3, AUTISM MASTER FILE (Fed. Cl. Spec. Mstr. Sept. 29, 2008).

On that same day, Special Master Vowell issued an Order, requiring Petitioners to file a Status Report by October 17, 2008, explaining whether Petitioners preferred to remain in the Omnibus Autism Proceeding and pursue their claim under the first or second theories of "general causation" or pursue their case based on the third theory on an individual basis, outside of the Omnibus Autism Proceeding. ECF No. 24.

On October 10, 2008, Petitioners filed a Status Report stating that Petitioners decided to remain in the Omnibus Autism Proceeding, pending decisions on the "combined Thimerosal and MMR" test cases, *i.e.*, the cases brought under the PSC's first theory of "general causation." ECF No. 25 at 1. Petitioners also represented they were not requesting a case-specific hearing. ECF No. 25 at 1. On October 14, 2008, Special Master Vowell issued an Order, granting Petitioners' request for this case to remain in the Omnibus Autism Proceeding. ECF No. 26 at 2.

In 2009, the Office of Special Masters issued decisions on the three test cases that relied on the first theory of "general causation;" these decisions rejected the theory that a combination of thimerosal-containing vaccines and the MMR vaccine could cause autism. *See Cedillo v. Sec'y of Health & Human Servs.*, No. 98-916V, 2009 WL 331968 (Fed. Cl. Spec. Mstr. Feb. 12, 2009) *aff'd*, 89 Fed. Cl. 158 (2009), *aff'd*, 617 F.3d 1328 (Fed. Cir. 2010); *Hazlehurst v. Sec'y of Health & Human Servs*., No. 03-654V, 2009 WL 332306 (Fed. Cl. Spec. Mstr. Feb. 12, 2009), *aff'd* 88 Fed. Cl. 473 (2009), *aff'd*, 604 F.3d 1343 (Fed. Cir. 2010); *Snyder v. Sec'y of Health & Human Servs.*, No. 01-162V, 2009 WL 332044 (Fed. Cl. Spec. Mstr. Feb. 12, 2009), *aff'd*, 88 Fed. Cl. 706 (2009).[24]

In 2010, the Office of Special Masters issued decisions on the three test cases that relied on the second theory of "general causation;" these decisions rejected the theory that thimerosal-containing vaccines, alone, could cause autism. *See Dwyer v. Sec'y of Health & Human Servs.*, No. 03-1202V, 2010 WL 892250 (Fed. Cl. Spec. Mstr. Mar. 12, 2010); *King v. Sec'y of Health & Human Servs.*, No. 03-584V, 2010 WL 892296 (Fed. Cl. Spec. Mstr. Mar. 12, 2010); *Mead v. Sec'y of Health & Human Servs.*, No. 03-215V, 2010 WL 892248 (Fed. Cl. Spec. Mstr. Mar. 12, 2010).[25]

On January 12, 2011, the Office of Special Masters issued an Autism Update to advise the petitioners in the Omnibus Autism Proceeding that they either needed to pursue their claims as

[24] The petitioners in *Snyder* did not appeal the decision of the United States Court of Federal Claims to the United States Court of Appeals for the Federal Circuit.

[25] The petitioners in the test cases brought under the second theory of "general causation" did not appeal the decisions issued by the Office of Special Masters.

individual cases under a new causation theory or voluntarily dismiss their claims. Autism Update-January 12, 2011 at 3, AUTISM MASTER FILE (Fed. Cl. Spec. Mstr. Jan. 12, 2011).

B. As An Individual Case.

On August 9, 2011, Petitioners filed a Motion, requesting that Special Master Vowell allow Petitioners to obtain all medical records pertaining to R.A. and his mother, Donna Anderson. ECF No. 28. On August 15, 2011, Special Master Vowell granted that Motion. ECF No. 29.

On November 14, 2011, Petitioners filed a Motion To Strike Petitioners' Exhibits 1–7. ECF No. 30. On that same day, Special Master Vowell granted the Motion. ECF No. 31. On November 29, 2011, Petitioners filed Medical Records as Petitioners' Exhibit 20. ECF No. 33. On that same day, Special Master Vowell also issued a Scheduling Order, requiring Petitioners to file an Amended Petition, Medical Records, and a Statement of Completion

On January 13, 2012, Petitioners filed Medical Records as Petitioners' Exhibit 21. ECF No. 34. On January 30, 2012, Petitioners filed the January 30, 2012 Affidavit of Bruce Anderson as Petitioners' Exhibit 22, and a May 21, 2011 Affidavit of Bruce Anderson and Donna Anderson as Petitioners' Exhibit 23. ECF No. 35. On that same day, Petitioners filed a Statement of Completion, informing Special Master Vowell that all medical records were filed with the Office of Special Masters. ECF No. 36.

On February 1, 2012, Petitioners filed an Amended Petition. ECF No. 39. On that same day, Petitioners filed the February 1, 2012 Supplemental Affidavit of Bruce Anderson as Petitioners' Exhibit 24. ECF No. 38.

On March 1, 2012, Special Master Vowell convened a status conference to discuss the next steps in the case, in light of the recently filed Amended Petition and Statement of Completion. On March 2, 2012, Special Master Vowell issued an Order, requiring Petitioners to file an Expert Report by May 1, 2012. ECF No. 40. That date subsequently was extended to August 28, 2012. ECF No. 41.

On August 28, 2012, Petitioners filed a Motion For Extension Of Time And Approval Of Expert's Retainer Agreement. ECF No. 44. On September 12, 2012, the Government filed a Response, opposing Petitioners' Motion For Approval Of Expert's Retaining Agreement, arguing that the expert's cost was unreasonably high. ECF No. 45. On October 15, 2012, Special Master Vowell issued an order granting Petitioners' Motion For Extension Of Time, but denying Petitioners' Motion For Approval Of Expert's Retainer Agreement. ECF No. 47. Afterwards, Petitioners filed several unopposed motions for extensions of time, within which to file their Expert Reports and Medical Records; these motions were also granted by Special Master Vowell.

On August 11, 2014, Petitioners filed Medical Records as Petitioners' Exhibit 25. ECF No. 64. On August 19, 2014, Petitioners filed Medical Records, as Petitioners' Exhibit 26. ECF No. 65.

On October 1, 2014, after receiving additional extensions of time, Petitioners filed the expert report of Dr. Ahm Mahbubul Huq, as Petitioners' Exhibits 27 and 28. ECF No. 66.

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On November 13, 2014, the case was reassigned to Special Master Brian H. Corcoran. ECF No. 69 at 1. On December 5, 2014, Special Master Corcoran convened a telephone status conference and issued a Scheduling Order requiring parties to submit a joint status report and proposing dates for a hearing before February 13, 2015.

On February 6, 2015, the Government filed the Expert Report of Dr. Bruce Cohen as Government's Exhibits A–B ("Gov't Exs. A–B"). ECF No. 71.

On March 10, 2015, Special Master Corcoran issued a scheduling order and set a hearing date for December 8, 2015. ECF No. 74.

On May 11, 2015, Petitioners filed a Supplemental Expert Report by Dr. Huq, as Petitioners' Exhibit 29. ECF No. 76. On May 20, 2015, Petitioners filed six articles referenced by Dr. Huq in his Expert Report. ECF No. 77. Petitioners explained that those articles were not available when Dr. Huq's report was filed. ECF No. 77.

On June 10, 2015, Petitioners filed Medical Records, as Petitioners' Exhibits 30–36. ECF No. 79 at 1. On that same day, Petitioners also filed additional Medical Records, as Petitioners' Exhibits 37–38. ECF No. 80.

On September 3, 2015, Petitioners re-filed medical literature, as Petitioners' Exhibits 27 and 29. ECF No. 82. On the same day, Petitioners also filed additional medical literature, as Petitioners' Exhibits 39–40, and also filed their Pre-Hearing Submissions. ECF Nos. 83, 84.

On September 18, 2015, Petitioners filed a Motion For Interim Attorney's Fees and Costs. ECF No. 85 at 1. On September 25, 2015, the Government filed a Response. ECF No. 86 at 1.

On October 2, 2015, the Government filed Pre-Hearing Submissions. ECF No. 87. On October 21, 2015, the Government filed a Witness List. ECF No. 88. On October 27, 2015, Petitioners filed medical records, as Petitioners' Exhibit 41. ECF No. 89. On that same day, Petitioners filed a Supplement to Petitioners' Pre-Hearing Submission, that included a short explanation of the medical articles and availability of the witnesses. ECF No. 90 at 1. Also on that same day, Petitioners filed medical literature, the transcript of an August 26, 2009 meeting of the Committee To Review Adverse Effects Of Vaccines, and a Powerpoint presentation from that meeting, as Petitioner's Exhibits 42–52. ECF Nos. 91, 92. Finally, on that same day, Petitioners also filed a Reply Brief to the Government's Pre-Hearing Submissions. ECF No. 93.

On October 29, 2015, Special Master Corcoran issued an Unpublished Decision, denying Petitioners' interim attorney's fees and costs in response to Petitioners' September 18, 2015 Motion. ECF No. 94.

From December 8–9, 2015, Special Master Corcoran convened an evidentiary hearing, including testimony from the parties' experts Drs. Huq and Cohen. 12/8/15 TR at 1–406. Thereafter, Special Master Corcoran issued an Order advising the parties to file Post-Hearing Briefs. ECF No. 96.

On May 10, 2016, the Government filed the Post-Hearing Brief. ECF No. 104. On the same day, Petitioners also filed the Post-Hearing Brief. ECF No. 105.

On November 1, 2016, Special Master Corcoran issued a Decision Denying Compensation, finding that Petitioners did not meet their burden to establish that the MMR vaccine had a connection to R.A.'s autism spectrum disorder diagnosis. *See Anderson v. Sec'y of Health & Human Servs.*, No. 02-1314V, 2016 WL 8256278 at *28 (Fed. Cl. Spec. Mstr. Nov. 1, 2016); 11/1/16 Dec. at 41. On November 29, 2016, Petitioners filed a Motion For Interim Attorney's Fees And Expenses. ECF No. 107.

On December 1, 2016, Petitioners filed a Motion For Review ("Pet. Mem.") with the United States Court of Federal Claims. ECF No. 110. The case was assigned to the undersigned judge. ECF No. 111. On December 16, 2016, the Government filed a Response to Petitioners' November 29, 2016 Motion For Interim Attorney's Fees And Expenses. ECF No. 113.

On January 3, 2017, the Government filed a Response to Petitioners' December 1, 2016 Motion For Review. ECF No. 115.

III. DISCUSSION.

A. Jurisdiction.

The United States Court of Federal Claims has jurisdiction to review the decision of a Special Master in a vaccine-related injury case, pursuant to 42 U.S.C. § 300aa-12(e)(2) and Vaccine Rule of the United States Court of Federal Claims ("Vaccine Rule") 23(a). After reviewing the Special Master's decision, the court may:

> (A) uphold the findings of fact and conclusions of law of the special master and sustain the special master's decision,
>
> (B) set aside any findings of fact or conclusion of law of the special master found to be arbitrary, capricious, an abuse of discretion, or otherwise not in accordance with law and issue its own findings of fact and conclusions of law, or
>
> (C) remand the petition to the special master for further action in accordance with the court's direction.

42 U.S.C. § 300aa-12(e)(2); *see also* Vaccine Rule 27 (same).

B. Standard Of Review.

Congress authorized the United States Court of Federal Claims with jurisdiction to review conclusions of law made by Special Masters under the Vaccine Act *de novo*, *i.e.*, under a "not in accordance with law" standard. See 42 U.S.C. § 300aa-12(e)(2)(B); *see also Saunders v. Sec'y of Health & Human Servs.*, 25 F.3d 1031, 1033 (Fed. Cir. 2004) ("Fact findings are reviewed by [the United States Court of Appeals for the Federal Circuit], as by the [United States Court of Federal] Claims Court judge, under the arbitrary and capricious standard; legal questions under the 'not in accordance with law' standard; and discretionary rulings under the abuse of discretion standard."

(quoting *Munn v. Sec'y of Health & Human Servs.*, 970 F.2d 863, 870 n.10 (Fed. Cir. 1992))); *Hines v. Sec'y of Health & Human Servs.*, 940 F.2d 1518, 1527 (Fed. Cir. 1991) ("The 'not in accordance with the law' aspect of the standard of review is . . . involved . . . [where there is] dispute over statutory construction or other legal issues.").

Factual findings of a Special Master should be set aside only if they are found to be "arbitrary and capricious" or if the Special Master has abused his/her discretion in making these findings. *See* 42 U.S.C. § 300aa-12(e)(2)(B). But, the United States Court of Appeals for the Federal Circuit has held that there is "no uniform definition of this standard," and instructed that the decision of a Special Master may be found to be "arbitrary and capricious," only if he/she:

> relied on factors which Congress has not intended [the Special Master] to consider, entirely failed to consider an important aspect of the problem, offered an explanation for its decision that runs counter to the evidence . . . or is so implausible that it could not be ascribed to a difference in view or the product of agency expertise.

Hines, 940 F.2d at 1527–28 (quoting *Motor Vehicle Mfrs. Ass'n v. State Farm Mut. Auto. Ins. Co.*, 463 U.S. 29 (1983)). Discretionary rulings are to be reviewed under an "abuse of discretion standard." *Munn*, 970 F.2d at 870 n.10.

C. The Elements And Burden Of Proof In Vaccine Act Cases.

The Vaccine Act provides that a petitioner may receive compensation and other relief, if injury can be established, either by causation-in-law or causation-in-fact. Causation-in-law is established if one of the vaccines listed in the Vaccine Injury Table at 42 U.S.C. § 300aa-14(a) ("Vaccine Table") was administered and the "first symptom or manifestation of onset" of specific adverse medical conditions associated with the use of each vaccine occurred within a time period specified in the Vaccine Table. *See* 42 U.S.C. § 300aa-14(a); 42 C.F.R. § 100.3(a). And, the Vaccine Table is to be read and interpreted by reference to "qualifications and aids to interpretation," that define the key terms used therein. 42 U.S.C. § 300aa-14(b).

Congress also afforded a petitioner with an opportunity to receive relief under the Vaccine Act, even if the time period for the first symptom or manifestation of a specified injury is not listed in the Vaccine Table, *i.e.*, for an "off-Table" vaccine injury. *See* 42 U.S.C. §§ 300aa-11(c)(1)(C)(ii), 300aa-13. In these cases, a petitioner must establish causation-in-fact, by offering sufficient facts to establish each element of a vaccine injury claim, and meet the burden of proof as to each element by a "preponderance of the evidence" standard. *See* 42 U.S.C § 300aa-13.

In *Capizzano v. Secretary of Health & Human Services*, 440 F.3d 1317 (Fed. Cir. 2006), the United States Court of Appeals for the Federal Circuit re-affirmed the three-part test established in *Althen v. Secretary of Health & Human Services*, 418 F.3d 1274, (Fed. Cir. 2005) ("*Althen*"), for determining causation-in-fact in off-Table vaccine injury cases. Therein, a petitioner is required to:

> show by preponderant evidence that the vaccination brought about [the] injury by providing:
> (1) a medical theory causally connecting the vaccination and the injury;

(2) a logical sequence of cause and effect showing that the vaccination was the reason for the injury; and
(3) a showing of a proximate temporal relationship between vaccination and injury.

418 F.3d at 1278.

If a petitioner establishes causation-in-fact, then the burden of proof shifts to the Government to establish that a factor unrelated to the vaccine was the cause of a petitioners' injury. *See* 42 U.S.C. § 300aa-13(a)(1)(B); *see also Althen*, 418 F.3d at 1278 ("If [a petitioner] satisfies this burden, [she/he] is entitled to recover [damages] unless [the Government] shows, by a preponderance of evidence, that the injury was in fact caused by factors unrelated to the vaccine.") (internal quotation marks omitted).

D. The Special Master's November 1, 2016 Decision.

1. R.A. Did Not Suffer From A Secondary Mitochondrial Disease.

In this case, the Special Master first emphasized the "important point" that R.A. did not suffer from a "primary" mitochondrial disease.[26] 11/1/16 Dec. at 35. Therefore, the relevant inquiry was whether R.A. suffered from a "secondary" mitochondrial disease."[27] 11/1/16 Dec. at 35. Dr. Huq,[28] Petitioners' expert, opined that R.A. had "mitochondrial dysfunction"[29] that was significant enough to precipitate R.A.'s subsequent developmental problems. 11/1/16 Dec. at 16. Dr. Huq's determination was based on R.A.'s clinical history and physician opinions, and medical evidence of: (1) dysfunction of the central nervous system, (2) gastrointestinal system problems

[26] Mitochondria are cellular organelles that are present in the body's cells and are primarily responsible for creating energy. *See* DORLAND'S at 1169 ("Mitochondria generate energy[.]"). According to Dr. Cohen, "primary" mitochondrial disease results from pathogenic mutations in genes that regulate mitochondrial function. 11/1/16 Dec. at 23. Patients with a primary mitochondrial disease have such symptoms as: loss of vision; dystonia; severe encephalopathy; and eventually death. 11/1/16 Dec. at 23.

[27] "Secondary" mitochondrial disease, however, is manifested by impairments to mitochondrial function that do not result from pathogenic gene mutations, but may be triggered by environmental stimuli, such as chemotherapy or poisons. 11/1/16 Dec. at 23.

[28] Dr. Huq is a board-certified neurologist with a special qualification in child neurology and clinical genetics. 11/1/16 Dec. at 15; *see also* Pet. Ex. 28 (Curriculum vitae of Ahm Mahbubul Huq). The vast majority of Dr. Huq's patients, however, do not have mitochondrial disorders. 1/1/16 Dec. at 15 n.21. Therefore, the Special Master weighed this factor as diminishing the value of Dr. Huq's testimony. 11/1/16 Dec. at 15 n.21.

[29] Dr. Huq used the term "mitochondrial dysfunction" to describe conditions that result from mitochondria that are not properly functioning, but do not manifest as "primary" mitochondrial disease. 11/1/16 Dec. at 35.

(diarrhea), (3) musculoskeletal system issues (hyperextensibility), and (4) liver dysfunction (*i.e.*, elevated liver enzymes). 11/1/16 Dec. at 16.

In contrast, Dr. Cohen,[30] the Government's expert, testified that there was no credible medical evidence that R.A. had a secondary mitochondrial disease. 11/1/16 Dec. at 23–24. The Special Master agreed, finding that the "medical record does not support that conclusion, and the [physician] opinion and testing results relied upon for the diagnosis are either based on demonstrably incorrect assumptions or inconclusive evidence." 11/1/16 Dec. at 35.

Dr. Huq testified that R.A.'s history of diarrhea evidenced multisystem dysfunction, a symptom of mitochondrial disease. 11/1/16 Dec. at 16. But, Dr. Cohen explained that patients suffering from secondary mitochondrial disease would experience symptoms more severe than chronic diarrhea. 11/1/16 Dec. at 24. The Special Master found Dr. Cohen's reasoning more persuasive, because Dr. Huq "inflat[ed] a less severe gastrointestinal problem . . . into an alarming warning sign." 11/1/16 Dec. at 36.

Dr. Huq testified that tests performed on R.A., from 2001 through 2010, evidenced "bioclinical abnormalities" that were indirect markers of mitochondrial dysfunction. 11/1/16 Dec. at 17. These abnormalities included: mildly elevated lactic levels; low free and total carnitine levels; multiple amino acids in the urine; and elevated liver enzymes. 11/1/16 Dec. at 17. But, Dr. Cohen questioned the reliability of the test results. 11/1/16 Dec. at 36. The Special Master determined that Dr. Cohen persuasively established that "the lactic acid test results were untrustworthy, and would under more generally accepted diagnostic approaches today be deemed of far less utility in evaluating the presence of mitochondrial dysfunction." 11/1/16 Dec. at 36. The Special Master also found that "the enzymology testing failed to appropriately standardize results by using the marker enzyme citrate synthase, and positive results were otherwise inconsistent or not replicated." 11/1/16 Dec. at 36. Therefore, the Special Master concluded that "the test results… are not robust or trustworthy enough to find it 'more likely than not' that R.A. possessed mitochondrial dysfunction." 11/1/16 Dec. at 36.

Based on the test results, in 2008, Dr. Shoffner also diagnosed R.A. with mitochondrial dysfunction. 11/1/16 Dec. at 24. Again, Dr. Cohen challenged this diagnosis, because Dr. Shoffner's assumptions about R.A.'s medical history were, in his professional judgment, not accurate. 11/1/16 Dec. at 36. Dr. Shoffner also assumed that R.A. had experienced a regression of skills. 11/1/16 Dec. at 36. The Special Master, however, observed that R.A.'s medical records did not evidence signs of regression, a matter conceded by Dr. Huq. 11/1/16 Dec. at 19–20, 37. Although the Special Master acknowledged that Dr. Shoffner was one of R.A.'s treating physicians, nevertheless that fact alone did "not mean that [Dr. Shoffner's] opinion automatically [was] entitled to the level of deference and evidentiary weight given to contemporaneous treater

[30] Dr. Cohen is a board-certified neurologist with 22 years of experience in mitochondrial disease and disorders. 11/1/16 Dec. at 22–23; *see also* ECF No. 71-2 (Curriculum vitae of Bruce H. Cohen). Approximately 75% of Dr. Cohen's clinical practice concerns patients with mitochondrial disease; as such he has seen thousands of patients during the past 15 years. 11/1/16 Dec. at 22–23. Dr. Cohen also taught courses on mitochondrial disease, and served on the Editorial Board for the journals *Mitochondrion* and *Pediatric Neurology*. 11/1/16 Dec. at 22.

records in many Program cases—especially when, as here, he reached his conclusion long after the immediately relevant time period." 11/1/16 Dec. at 36 (citing *Nuttall v. Sec'y of Health & Human Servs.*, 122 Fed. Cl. 821, 832 (2015) (determining that a treating physician was not entitled to deference when he treated the patient after the alleged vaccine injury occurred)). In addition, the Special Master found that Dr. Shoffner's diagnosis was unreliable, because "the testing results he obtained were too erratic, with some supporting Petitioners' argument while others did not." 11/1/16 Dec. at 37.

In sum, the Special Master afforded more weight to Dr. Cohen's testimony than Dr. Huq's, primarily because of Dr. Cohen's clinical experience with patients with mitochondrial diseases. 11/1/16 Dec. at 37. And, "Dr. Cohen persuasively established that, based on his own professional experience, [that] R.A.'s history [was] not that of a child suffering from any form of mitochondrial disease." 11/1/16 Dec. at 37.

2. Petitioners Did Not Satisfy the *Althen* Factors.

In this case, the Special Master determined that he did not need to evaluate the *Althen* factors, "because Petitioners [could] not establish the keystone of their argument [*i.e.*, presence of mitochondrial disease]." 11/1/16 Dec. at 37. Nevertheless, the Special Master briefly addressed each of the *Althen* factors. 11/1/16 Dec. at 37.

a. The First *Althen* Factor—A Reliable Causation Theory.

The Special Master found that "Petitioners . . . failed to offer a reliable scientific theory linking the MMR vaccine to autism," because "much of the scientific basis for [Petitioners'] theory assumed developmental regression, which . . . R.A. did not experience." 11/1/16 Dec. at 37. Although Dr. Huq opined that R.A.'s developmental injury began with administration of the MMR vaccine, that induced a response and initiated a cascade of events, leading to inflammation, exacerbated by immune dysfunction, and culminating in R.A.'s subsequent development of autism, the Special Master found that "Petitioners have offered little persuasive or reliable support for the proposition that the MMR vaccine could initiate the 'inflammatory cascade' they posit eventually, and over many months' time, result[ed] in autism." 11/1/16 Dec. at 38.

In addition, the Special Master found that "Petitioners' theory relating to the connection between mitochondrial disease and autism was similarly unreliable." 11/1/16 Dec. at 38. The medical literature proffered by Dr. Huq, discussed a causal reaction only in cases of primary mitochondrial disease, that R.A. did not have. 11/1/16 Dec. at 38

The Special Master also observed that "the theory that a vaccine (in particular, the MMR vaccine) could cause autism is one that has been consistently unsuccessful" in the Omnibus Autism Proceeding and subsequent decisions. 11/1/16 Dec. at 38–39; *see also Hardy v. Sec'y of Health & Human Servs.*, No. 08-108V, 2015 WL 7732603 at *4–5 (Fed. Cl. Spec. Mstr. Nov. 3, 2015) (referencing eleven unsuccessful autism claims, and six others that were rejected without trial). Therefore, the Special Master determined that Petitioners failed to satisfy the first *Althen* factor. 11/1/16 Dec. at 40.

b. The Second *Althen* Factor—Sequence Of Cause And Effect.

The Special Master also found that R.A.'s medical record "d[id] not allow the conclusion that R.A. experienced any reaction to the MMR vaccine." 11/1/16 Dec. at 40. Dr. Cohen's opinion was that the high fever R.A. experienced, within a week of the MMR vaccination, was viral and not a reaction from the MMR vaccine. 11/1/16 Dec. at 40. As such, the Special Master reasoned that "[Petitioners'] allegations [were] contradicted by the contemporaneous medical records, which identify nothing about developmental problems for R.A. prior to . . . six months after the [MMR] vaccination." 11/1/16 Dec. at 40.

The Special Master also discounted Dr. Shoffner's diagnosis of mitochondrial disease, because "the test results Dr. Shoffner relied upon were overall inconclusive and had too much variability to conclude that R.A. suffered from a true metabolic disorder casually related to the MMR vaccine." 11/1/16 Dec. at 40. Therefore, the Special Master determined that Petitioners failed to satisfy the second *Althen* factor. 11/1/16 Dec. at 40.

c. The Third *Althen* Factor—A Medically Acceptable Timeframe.

In addition, the Special Master acknowledged that "viewed loosely, the facts of this case would fit the timeframe that Petitioners urge flows from their theory." 11/1/16 Dec. at 41. R.A.'s "inflammatory cascade" was triggered within a week of the MMR vaccination, but R.A. did not exhibit developmental problems, such as being unable to follow commands or point to pictures in books, until six months later. 11/1/16 Dec. at 41. The Special Master determined that "[viewed] carefully, [Petitioners'] proposed timeframe d[id] not work, and ultimately reflect[ed] the temporal reasoning rejected by controlling precedent." 11/1/16 Dec. at 41 (citing *LaLonde v. Sec'y of Health & Human Servs.*, 746 F. 3d 1334, 1341 (Fed. Cir. 2014) (holding that a temporal correlation alone is not enough to demonstrate causation). Accordingly, the Special Master found that, even if he assumed that the MMR vaccine could trigger a developmental injury, Petitioners offered no "literature or reliable scientific support" to show why the cognitive developmental injury did not manifest until six months later. 11/1/16 Dec. at 41. Therefore, the Special Master determined that Petitioners failed to satisfy the third *Althen* factor. 11/1/16 Dec. at 41.

E. Petitioners' December 1, 2016 Motion For Review.

1. Petitioners' Arguments.

Petitioners first argue that the Special Master erroneously applied the doctrine of collateral estoppel to preclude Petitioners from presenting evidence regarding the role of measles immunosuppression, fever, and cytokine activation in the subsequent development in R.A.'s mitochondrial dysfunction and autistic-like sequelae. Pet. Mem. at 10. In this case, the Special Master erroneously decided that a factual finding by another special master in a "test case" in the Omnibus Autism Proceeding, was binding on Petitioners. Pet. Mem. at 9–10; *see also Snyder v. Sec'y of Health & Human Servs.*, No. 01-162, 2009 WL 332044 at *104 (Fed. Cl. Spec. Mstr. Feb. 12, 2009) ("[P]etitioners have failed to demonstrate that the MMR vaccine caused immunosuppression. There is no evidence that children receiving the vaccine have higher rates of infection in the months after vaccination than children who do not receive the vaccine."), *aff'd* 88

Fed. Cl. 706 (2009). Petitioners, however, were not party to *Snyder*, and therefore the Special Master's reliance on *Snyder* was erroneous as a matter of law. Pet. Mem. at 17.

Petitioners then identify six other areas where the Special Master erred. The Special Master failed to acknowledge inconsistent testimony and contradictory evidence by Dr. Cohen that R.A. did not suffer from mitochondrial dysfunction. Pet. Mem. at 17. Dr. Huq testified that R.A. suffered from a mitochondrial dysfunction, and Petitioners proffered a medical study (the "Anitha Article"),[31] that demonstrated abnormal mitochondrial gene expression and electron transport chain activity in the cerebellum, frontal, and temporal lobes of autistic children, and these brain regions affect social communication, language function, and behavior. Pet. Mem. at 20–21. Petitioners also proffered a post-mortem study of brain tissue taken from individuals with autism (the "Chauhan Article"),[32] that found a reduction of mitochondrial electron transport chain complexes in those same parts of the brain. Pet. Mem. at 21. Initially, Dr. Cohen agreed with Dr. Huq that "the post mortem brain studies conducted by Anitha and Chauhan showed altered mitochondrial expression in the areas of the brain, from which autistic symptoms arise." Pet. Mem. at 22 (citing 12/8/15 TR at 375). But, Dr. Cohen subsequently declared these studies flawed, because mitochondrial proteins degrade quickly upon death at room temperature. Pet. Mem. at 22. Dr. Cohen, however, did not offer any support for this statement. Pet. Mem. at 22. Nevertheless, the Special Master approvingly cited Dr. Cohen's testimony in his decision. Pet. Mem. at 22 (citing 11/1/16 Dec. at 28).

The Special Master also ignored considerable agreement between the experts on a subset of metabolic patients who are vulnerable to the effects of vaccination. Pet. Mem. at 23–24. Dr. Huq testified that there are "certain individuals with inborn error of metabolism" that "could be particularly vulnerable, and they need extra attention before we vaccinate them." Pet. Mem. at 24. Petitioners proffered Petitioners' Exhibits 47 and 50 (the "Klein Article" and the "Menni Article") that discuss that these individuals experienced a "four-fold" risk of hospitalization within weeks of vaccination.[33] Pet. Mem. at 24. Dr. Cohen offered no comment on these articles, nor did the Special Master. Pet. Mem. at 24–25. The Special Master, however, admitted that the articles proffered by Petitioners support the theory that primary mitochondrial diseases are associated with autism. Pet. Mem. at 25. The Special Master, however, found fault with Dr. Huq's position that secondary mitochondrial disorders can also lead to an autistic-like phenotype, although Dr. Cohen agreed that a small percentage of patients had both mitochondrial dysfunction and autism. Pet.

[31] Ayyapan Anitha et. al., *Brain Region-Specific Altered Expression And Association Of Mitochondria-Related Genes In Autism*, 3 MOLECULAR AUTISM 12 (2012).

[32] Abha Chauhan et. al., *Brain Region-Specific Deficit In Mitochondrial Electron Transport Chain Complexes In Children With Autism*, 117 J. NEUROCHEMISTRY 209 (2011).

[33] These articles were: Nicola P. Klein et. al., *Evaluation Of Immunization Rates And Safety Among Children With Inborn Errors Of Metabolism*, 127 J. PEDIATRICS 1139 (2011) (Pet. Ex. 47); Francesa Menni et. al, *Vaccination In Children With Inborn Errors Of Metabolism*, VACCINE (2012), http://dx.doi.org/10.1016/j.vaccine.2012.10.012 (Pet. Ex. 50).

Mem. at 25. By faulting Dr. Huq's position, the Special Master ignored "considerable agreement" between the experts. Pet. Mem. at 25.

The Special Master failed to acknowledge numerous instances where the parties agreed on the underlying facts. Pet. Mem. at 25. Both parties agreed that mitochondria create energy for the body and, as a natural by-product of that energy production, generate waste products in the form of reactive oxygen species ("ROS"). Pet. Mem. at 25–26. Both parties agreed that the body has natural compensatory mechanisms to contain the toxic effects of ROS and when those compensatory mechanisms fail, symptoms emerge. Pet. Mem. at 26. Both parties agreed that fevers can occur within a week after MMR vaccination. Pet. Mem. at 26. Both parties also agreed that R.A. was considered to be healthy at his one year old evaluation. Pet. Mem. at 26. Moreover, both parties agreed that, in primary mitochondrial disease, "clinical deterioration" may result at the end of a viral illness due to the body's inability to handle "oxidative stress." Pet. Mem. at 26. The Special Master's failure to acknowledge those underlying facts when making his decision was arbitrary and capricious. Pet. Mem. at 25.

The Special Master failed to consider the logical sequence between R.A.'s vaccination and his injuries. Pet. Mem. at 27–29. In arguing this, Petitioners posit that R.A. had a mitochondrial dysfunction, so that the MMR vaccine induced a febrile response and initiated a cascade of inflammation, that further exacerbated the underlying mitochondrial dysfunction, finally leading to an autistic-like phenotype. Pet. Mem. at 28. Petitioners explain that R.A.'s regression was gradual, because the body's compensatory mechanisms were at work; significant impairment or regression was not apparent until the body's threshold limit was exceeded. Pet. Mem. at 28–20. But this process evidences a logical sequence of cause and effect between R.A.'s vaccination and his injuries. Pet. Me. at 29.

The Special Master's credibility findings were arbitrary and capricious, because he failed to take into account "numerous inconsistences" between Dr. Cohen's testimony and medical literature published by Dr. Cohen. Pet. Mem. at 29–42. For example, Dr. Cohen disputed Dr. Huq's finding that R.A. had a multisystem dysfunction. Pet. Mem. at 30. But, Dr. Cohen previously published an article listing multi-organ system involvement as a symptom of metabolic disorders and R.A. exhibited symptoms associated with injuries to multiple organs, including muscle hypotonia, autism spectrum disorder, gastrointestinal problems, proximal renal tubular dysfunction, and fatigue. Pet. Mem. at 30.

Finally, the Special Master failed to consider relevant evidence and the record as a whole in finding no temporal relationship between the December 13, 1999 MMR vaccination and R.A.'s symptoms and autistic-like phenotype. Pet. Mem. at 42–45. R.A.'s "inflammatory cascade" was triggered within a week of vaccination, and then his symptoms "slowly agglomerated" until he evidenced developmental issues six months later. Pet. Mem. at 43. Petitioners argue that this timing is medically appropriate in R.A.'s case because "from the complex pathophysiology of this complex interaction . . . you would expect a slow gradual evolution of the phenotype." Pet. Mem. at 44.

In support of this argument, Petitioners cite *Paluck v. Secretary of Health & Human Services*, 786 F. 3d 1373 (Fed. Cir. 2015), wherein the United States Court of Appeals for the Federal Circuit affirmed the United States Court of Federal Claims' determination that the

petitioners' medical theory satisfied the third *Althen* factor when expert testimony indicated that vaccine induced neurodegeneration proceeds in two phases. Pet. Mem. at 45. In that case, the first phase, "immune system activation," occurred within a week of immunization. Pet. Mem. at 45. The second phase involved a downward spiral of activity between the mitochondria and oxidative stress, leading to the death of brain cells and neurodegeneration. Pet. Mem. at 45. Based on the expert testimony in *Paluck*, "no rigid time frame exist[s] as to when neuronal death could be expected to occur" because the emergence of neurological regression is dependent upon the severity and type of mitochondrial disorder. Pet. Mem. at 45–46 (citing *Paluck*, 786 F.3d at 1381). Therefore, the third *Althen* factor was met. Pet. Mem. at 46.

For these reasons, Petitioners argue that they presented a *prima facie* case by preponderant evidence that R.A. is entitled to compensation, and the Special Master's November 1, 2016 Decision should be set aside. Pet. Mem. at 46–47.

2. The Government's Response.

The Government responds that Petitioners are "re-argu[ing] the same evidence that was considered and found unpersuasive by the [S]pecial [M]aster, and improperly ask[ing] this Court to reweigh the evidence in the hope this Court will reach a different result." Gov't Mem. at 10. The Special Master properly concluded the medical record Petitioners' proffered was "too erratic, with some [of Dr. Shoffner's test results] supporting Petitioners' argument while others did not," but "credited Dr. Cohen's detailed testimony about each metabolic, biochemical, and genetic test performed on R.A. that simply did not reflect mitochondrial disease or dysfunction." Gov't Mem. at 14. "Simply put, R.A.'s purported mitochondrial dysfunction was not supported by preponderant evidence and the [S]pecial [M]aster . . . properly rejected it." Gov't Mem. at 14.

As to the first *Althen* factor, Petitioners' collateral estoppel argument is meritless. Gov't Mem. at 16. Nothing in the record suggests that Petitioners were barred from proffering evidence on the role of measles immunosuppression. Gov't Mem. at 16. The Special Master also did not commit legal error, by citing a factual finding from the Omnibus Autism Proceeding test case *Snyder*, since Petitioners voluntary opted into the Omnibus Autism Proceeding. Gov't Mem. at 16.

With respect to Petitioners' argument that the Special Master ignored "considerable agreement" between the parties' experts, Petitioners "failed to explain why this particular evidence is so material that it outweighs all of the other evidence upon which the Special Master relied." Gov't Mem. at 18.

As to the second *Althen* factor, the Special Master considered R.A.'s medical history and determined "to the extent Petitioners have attempted to establish onset in late December 1999, their allegations are contradicted by the contemporaneous medical records, which identify nothing about developmental problems for R.A. prior to June of 2000—six months after vaccination." Gov't Mem. at 19. Therefore, Petitioners failed to meet their evidentiary burden to establish the logical sequence of cause and effect. Gov't Mem. at 19.

Finally, with respect to Petitioners' argument regarding the third *Althen* factor, the Special Master found no temporal relationship. Gov't Mem. at 19. Moreover, Petitioners failed to explain

"why it took so long [after R.A. received the MMR vaccine until the developmental side of the injury manifested] without any demonstrable change in R.A., and the record itself also provides no illumination on this point." Gov't Mem. at 20 (quoting 11/1/16 Dec. at 41).

3. The Court's Resolution.

a. Regarding The Special Master's Finding That R.A. Did Not Suffer From "Mitochondrial Dysfunction."

Petitioners' medical theory was that R.A. suffered from an underlying secondary mitochondrial disease or "mitochondrial dysfunction" that was aggravated by the December 13, 1999 MMR vaccination, and this aggravation, in turn, caused developmental regression manifesting as autism spectrum disorder. 11/1/16 Dec. at 1–2, 35.

The Special Master, however, determined that Petitioners failed to meet their burden to establish by preponderant evidence that R.A. suffered from mitochondrial dysfunction. 11/1/16 Dec. at 35.[34] In coming to this conclusion, the Special Master weighed the expert testimony proffered by both parties. 11/1/16 Dec. at 35–37. The Special Master found the Government's expert, Dr. Cohen, more persuasive than Petitioners' expert, Dr. Huq, because Dr. Cohen was the "far more experienced medical practitioner when it comes to the subject of mitochondrial diseases and disorders, with more demonstrable expertise studying, diagnosing, and treating the condition," and he "persuasively established" that R.A.'s medical history did not evidence any form of mitochondrial disease. 11/1/16 Dec. at 37.

Although Petitioners object to the Special Master's credibility determination and subsequent factual finding on numerous grounds, as fact finder, the Special Master was tasked with assessing the reliability of expert testimony. *See Porter v. Sec'y of Health & Human Servs.*, 663 F.3d 1242, 1250 (Fed. Cir. 2011) ("[The United States Court of Appeals for the Federal Circuit] has unambiguously explained that special masters are expected to consider the credibility of expert witnesses in evaluating petitions for compensation under the Vaccine Act."). The Special Master's "unique position to see the witnesses and hear their testimony," requires the court to afford substantial deference to the Special Master's credibility determination. *See Doe v. Sec'y of Health & Human Servs.*, 601 F.3d 1349, 1355 (Fed. Cir. 2010) ("Because of the special master's unique position to see the witnesses and hear their testimony, such credibility assessments are 'virtually unreviewable on appeal.'" (quoting *Lampe v. Sec'y of Health & Human Servs.*, 219 F.3d 1357, 1360 (2000)).

The Special Master provided a rational basis for his credibility determination, and the November 1, 2016 Decision also reflects that he carefully considered the relevant evidence of record, drew plausible inferences, and articulated a rational basis for his finding that R.A. did not suffer from mitochondrial dysfunction. *See Lampe*, 219 F.3d at 1360. Therefore, it is not for the

[34] Both parties agreed that R.A. did not suffer from the primary form of mitochondrial disease, that is caused by an inborn genetic abnormality. 11/1/16 Dec. at 35; *see also* 12/8/15 TR at 169 ("[THE GOVERNMENT]: Would it be fair, in your opinion, to characterize R.A. as having *secondary* mitochondrial disorder? [DR. HUQ]: Yes." (emphasis added)).

court to "reweigh the factual evidence, or to assess whether the [S]pecial [M]aster correctly evaluated the evidence. And of course we do not examine the probative value of the evidence or the credibility of the witnesses. These are all matters within the purview of the fact finder." *See Munn*, 970 F.2d at 871.

b. Regarding The First *Althen* Factor.

i. Regarding "Collateral Estoppel."

With respect to the first *Althen* factor, Petitioners argue that the Special Master committed legal error by improperly applying the doctrine of collateral estoppel to preclude Petitioners "from presenting additional evidence on the role of measles immunosuppression . . . and its role in the subsequent development of R.A.'s mitochondrial dysfunction and autistic-like sequelae." Pet. Mem. at 10. But, review of the record and the transcript of the December 8–9, 2015 hearing demonstrates that the Special Master did not "preclude" Petitioners from proffering any evidence. Dr. Huq testified that the measles component of the MMR vaccine can have an immunosuppressive effect that affects mitochondrial function, and was allowed to testify to this effect, over an objection by the Government's counsel that he was not an immunologist. 12/8/2015 TR at 140–42, 153. In addition, Petitioners were not precluded from proffering medical literature regarding the immunosuppressive effect of the measles vaccination.[35] Therefore, the record evidences that the Special Master did not preclude Petitioners from proffering any medical evidence.

Petitioners also argue that the Special Master improperly relied on a factual finding in the Omnibus Autism Proceeding test case *Snyder* for the proposition that the MMR vaccine's "alleged immuno-suppressive capacity" was a "discredited concept." 11/1/16 Dec. at 38; *see also Snyder*, 2009 WL 332044, at *104 ("[P]etitioners have failed to demonstrate that the MMR vaccine caused immunosuppression. There is no evidence that children receiving the vaccine have higher rates of infection in the months after vaccination than children who do not receive the vaccine.").

The Special Master's citation of a factual finding from the Omnibus Autism Proceeding was not improper, because Petitioners elected to take part in that Proceeding by filing a Short Form Petition. ECF No. 3. Moreover, after Petitioners' initial causation theory was abandoned by the PSC,[36] Petitioners nevertheless elected to continue to pursue their claim through the Omnibus Autism Proceeding under the "combined Thimerosal and MMR" theory." ECF No. 25. *Snyder*

[35] Petitioners proffered, as Petitioners' Exhibit 29, Tab O, Lars Smedman et. al., *Immunosuppression After Measles Vaccination*, 83 ACTA PAEDIATR 164 (1994).

[36] Petitioners' individual case was initially selected as a "test case" for the theory that the MMR vaccine, alone, could cause autism. ECF No. 24. But, on September 29, 2008, the PSC decided not to pursue the third theory of "general causation," because it was not significantly "distinct" from the first theory, *i.e.*, that the MMR vaccine and thimerosal-containing vaccines, together, could cause autism. Autism Update-September 29, 2008 at 3, AUTISM MASTER FILE (Fed. Cl. Spec. Mstr. Sept. 29, 2008).

was one of the three test cases adjudicated under that theory. *See* 2009 WL 332044, at *2 (explaining that *Snyder* was a test case brought under the theory "that a combination of the MMR vaccine and [thimerosal containing vaccines], acting in concert, cause [autism spectrum disorder]"). By participating in the Omnibus Autism Proceeding, Petitioners agreed to allow the Office of Special Masters to apply conclusions reached in that test case to Petitioners' claim. *See* Autism General Order #1 at 3–4, AUTISM MASTER FILE (Fed. Cl. Spec. Mstr. July 3, 2002) ("The [Office of Special Masters] will inquire into the *general causation issues* involved in these cases--*i.e.*, whether the vaccinations in question can cause autism and/or similar disorders, and if so in what circumstances; and then, . . . the *conclusions reached in that general inquiry will be applied to the individual cases.*" (emphasis added)).

For these reasons, the court has determined that the Special Master did not commit a legal error by citing a factual finding from the Omnibus Autism Proceeding.

ii. Regarding Evidence Of A Vulnerable Subset Of Metabolic Patients.

Petitioners also argue that the Special Master "ignored" proffered medical literature, specifically the Klein Article and the Menni Article, that evidenced that children with metabolic disorders are more likely to be hospitalized within the weeks following a vaccination than children without metabolic disorders. Pet. Mem. at 24. But, although the Special Master did not expressly discuss these articles in the November 1, 2016 Decision, there is a presumption that the Special Master reviewed all proffered evidence unless he stated otherwise. *See Hazlehurst*, 604 F.3d at 1352 ("Even if the [S]pecial [M]aster had made no explicit reference to [certain] evidence . . . we would presume that she considered that evidence."); *see also Medtronic, Inc. v. Daig Corp.*, 789 F.2d 903, 906 (Fed. Cir. 1986) ("We presume that a fact finder reviews all evidence unless . . . explicitly express[ed] otherwise.").

In any event, these proffered articles discussed children with primary mitochondrial disease; *i.e.*, mitochondrial disease that arises due to an inherited genetic abnormality. Pet. Ex. 47 at 1140 (Klein) (explaining that the article's findings applied to children with inherited or "inborn" metabolic disorders); Pet. Ex. 50 at 1 (Menni) (same); *see also* 12/8/15 TR at 217–18 (testimony of Dr. Cohen explaining that primary mitochondrial disease is based on an inherited genetic abnormality). But, both parties agreed that R.A. did not suffer from primary mitochondrial disease. 11/1/16 Dec. at 35; *see also* 12/8/15 TR at 169 (testimony of Dr. Huq that R.A. suffered from a secondary mitochondrial disease).

For these reasons, the court has determined that the Special Master did not err with respect to the proffered medical literature regarding vaccination of children with inborn metabolic disorders. *See* 42 U.S.C. § 300aa-13(a)(1), (b) (providing that the Special Master is required to review the "record as a whole," including medical records, reports, and "all other relevant medical and scientific evidence"); *see also Medtronic, Inc.*, 789 F.2d at 906 ("We presume that a fact finder reviews all evidence unless . . . explicitly express[ed] otherwise.").

iii. Regarding Agreement Between The Experts.

Petitioners also argue that the Special Master's rejection of their causation theory was "arbitrary and capricious," because he "fail[ed] to acknowledge the numerous instances where the parties agreed on the underlying facts[.]" Pet. Mem. at 25. But, the areas of agreement identified by Petitioners either consist of generally accepted medical principles or are otherwise immaterial.

Petitioners first argue that Drs. Cohen and Huq agreed that mitochondria generate energy for the human body through a series of complex biochemical reactions, including oxidative phosphorylation, and that the waste created by this process can be harmful in the absence of the mitochondria's compensatory mechanisms. Pet. Mem. at 25–26. The first ground of agreement does not concern a novel medical principle, nor is it specific to R.A.'s case. *See, e.g.*, DORLAND'S at 1169 ("Mitochondria generate energy[.]"). The second ground of agreement again is not specific to R.A.'s case, and simply describes why a mitochondrial defect can result in injury. The other areas of agreement identified by Petitioners are similarly immaterial: both experts agreed that R.A. was healthy at his one year evaluation; both experts agreed that, in *primary* mitochondrial disease,[37] clinical deterioration can occur at the end of a viral illness; and both experts agreed that the measles vaccine *can* cause a fever, but Dr. Cohen subsequently testified that R.A.'s December 1999 fever was caused by a virus and not by the MMR vaccine (a conclusion shared by R.A.'s contemporaneous treating physicians). Pet. Mem. at 26; *see also* 11/1/16 Dec. at 40 (explaining that R.A.'s December 1999 fever was diagnosed as viral). Petitioners fail to demonstrate why the agreement as to these facts rendered the Special Master's finding with respect to the first *Althen* factor arbitrary and capricious or otherwise contrary to law. *See Munn*, 970 F.2d at 871 (holding that the court should not reweigh the factual evidence reviewed by the Special Master).

c. Regarding The Second *Althen* Factor.

With respect to the second *Althen* factor, Petitioners argue that the Special Master failed to consider "relevant evidence" regarding the cause and effect between R.A.'s pre-existing mitochondrial dysfunction, the December 13, 1999 MMR vaccination, and R.A.'s subsequent autism spectrum disorder. Pet. Mem. at 27. Petitioners emphasize that R.A.'s December 20, 1999 fever was the "initiating event" of a developmental regression. Pet. Mem. at 28. Although R.A.'s developmental regression arose gradually, this was because the body possesses compensatory mechanisms and a "reserve capacity" of neurons, that would have slowed the manifestation of any neurological injuries such that they did not arise until months after the December 13, 1999 vaccination. Pet. Mem. at 28–29.

Petitioners offer no grounds upon which to conclude that the Special Master's findings that R.A.'s medical history provided no evidence of a neurological regression, as conceded by Dr. Huq, and R.A. did not suffer from any "tailing or progressively concerning symptoms" following the December 20, 1999 fever, were "arbitrary and capricious." 11/1/16 Dec. at 40. For this reason, the court has determined that the Special Master's finding that Petitioners had not established the

[37] Both parties agreed that R.A. did not suffer from the "primary" form of mitochondrial disease. 11/1/16 Dec. at 35.

second *Althen* factor was not arbitrary, capricious, or contrary to law. *See Hazlehurst*, 604 F.3d at 1349 (holding that the court should not "second-guess the [S]pecial [M]aster's fact-intensive conclusions, particularly where the medical evidence of causation is in dispute.").

d. Regarding The Third *Althen* Factor.

With respect to the third *Althen* factor, Petitioners argue that, in *Paluck*, the United States Court of Appeals for the Federal Circuit affirmed the United States Court of Federal Claims' reversal of a Special Master who found no proximate temporal relationship between a vaccination and a subsequent "neurodegeneration [*i.e.*, regression]." *See* 786 F.3d at 1383–84. In that case, however, the Special Master set a "hard and fast deadline of three weeks between vaccination and the onset of clinically apparent symptoms of neurological injury." *See id.* at 1783. Moreover, the vaccinated child suffered a "precipitous and well-documented" neurological regression, the first symptom of which manifested twenty-three days after the vaccination. *See id.* at 1376, 1381, 1384. By five months after the vaccination, the *Paluck* child had fewer language skills than he had prior to the vaccination, and by nine months after his vaccination his brain had degenerated to the point where he had "no purposeful movements." *See id.* at 1382.

In this case, the Special Master did not arbitrarily set a "hard and fast" deadline, but instead found that Petitioners failed to explain why, in R.A.'s case, there was no sign of *any* neurological injury or developmental problem until six months after the December 13, 1999 vaccination. 11/1/16 Dec. at 41. In addition, the Special Master found no evidence that R.A. suffered from a regression, while in *Paluck* the child showed the first symptoms of regression within twenty-three days of vaccination and then further regressed over the following months. 11/1/16 Dec. at 19, 40 (explaining that Dr. Huq conceded there was no evidence of regression).

For these reasons, the court has determined that the Special Master's finding with respect to the third *Althen* factor was not arbitrary, capricious, or contrary to law. *See Pafford v. Sec'y of Health & Human Servs.*, 451 F.3d 1352, 1358 ("[T]he Special Master's requirement for strong temporal evidence is consistent with the third prong of the *Althen* test . . . . [W]ithout some evidence of temporal linkage, the vaccination might receive blame for events that occur weeks, months, or years outside of the time in which scientific or epidemiological evidence would expect an onset of harm.").

IV. CONCLUSION.

For these reasons, the court denies Petitioners' December 1, 2016 Motion For Review. The Clerk of Court is directed to enter judgment accordingly.

IT IS SO ORDERED.

s/ Susan G. Braden
SUSAN G. BRADEN
Chief Judge