In the United States Court of Federal Claims

OFFICE OF SPECIAL MASTERS

Filed: February 5, 2016

No. 13-44V

MICHAELA WATERMAN,	*	**TO BE PUBLISHED**
	*	
	*	Special Master
Petitioner,	*	Hamilton-Fieldman
	*	
v.	*	Entitlement; Gardasil;
	*	Human Papillomavirus (HPV)
SECRETARY OF HEALTH AND HUMAN SERVICES,	*	Vaccinations; Urticaria.
	*	
	*	
Respondent.	*	

Verne E. Paradie, Esq., Paradie, Sherman, Walker and Worden, Lewiston, ME, for Petitioner.
Gordon Shemin, Esq., United States Department of Justice, Washington, DC for Respondent.

RULING ON ENTITLEMENT[1]

On January 17, 2013, Jessica Dussault filed a petition for compensation under the National Vaccine Injury Compensation Program (the "Program")[2], 42 U.S.C § 300aa-10 et seq.

[1] Because this published ruling contains a reasoned explanation for the undersigned's action in this case, the undersigned intends to post this published ruling on the United States Court of Federal Claims' website, in accordance with the E-Government Act of 2002, codified as amended at 44 U.S.C. § 3501 note (2012). As provided by Vaccine Rule 18(b), each party has 14 days within which to request redaction "of any information furnished by that party: (1) that is a trade secret or commercial or financial in substance and is privileged or confidential; or (2) that includes medical files or similar files, the disclosure of which would constitute a clearly unwarranted invasion of privacy." Vaccine Rule 18(b). Otherwise, the entire ruling will be available to the public. *Id.*

[2] The National Vaccine Injury Compensation Program is set forth in Part 2 of the National Childhood Vaccine Injury Act of 1986, Pub. L. No. 99-660, 100 Stat. 3755, codified as amended, 42 U.S.C.A. § 300aa-10-§ 300aa-34 (2012) ("Vaccine Act" or the "Act"). All citations in this decision to individual sections of the Vaccine Act are to 42 U.S.C.A. § 300aa.

(Supp. 2000), on behalf of her then minor daughter, Michaela Waterman ("Petitioner")[3], who received a series of three human papillomavirus ("HPV") vaccinations, trade name Gardasil, on December 29, 2011, February 29, 2012, and July 11, 2012, and who subsequently suffered from "daily painful and itchy hives and pain in her joints", injuries which were allegedly caused by the Gardasil vaccinations. Petition at 1.

Petitioner submitted an expert report authored by Dr. David Axelrod on February 2, 2013. Petitioner's Exhibit ("Pet. Ex.") 8.[4] Respondent's Rule 4 Report, filed June 20, 2013, recommended against compensation. Respondent's Report ("Resp. Report"). An expert report authored by Dr. Shelby H. Josephs was also filed by Respondent on June 20, 2013. Respondent's Exhibit ("Resp. Ex.") A. Attempts at settlement proved unsuccessful and the parties began to prepare for hearing. Petitioner filed a Supplemental Expert Report from Dr. Axelrod on October 7, 2013, Pet. Ex. 21, as well as a number of medical literature exhibits in February 2014. The undersigned provided several medical literature articles for the parties' review in advance of hearing, on March 7 and March 10, 2014. Court Exhibits 1-5. An entitlement hearing was held in Washington, D.C. on March 12, 2014, the undersigned presiding. Testimony was taken from Petitioner, her mother, Jessica Dussault, and both parties' experts. Thereafter, additional medical and social media records were filed. For the reasons set forth below, the undersigned concludes that Petitioner has met her burden of proof under the Act and *Althen v. Secretary of Health and Human Services*, 418 F.3d 1274, 1278 (Fed. Cir. 2005) ("*Althen")*, and is entitled to a Program award.

I FACTUAL BACKGROUND

A. Relevant Medical History

Petitioner, Michaela Waterman, is an eighteen year-old female who received a series of three Gardasil vaccinations on December 29, 2011, February 29, 2012, and July 11, 2012, to protect her against the HPV virus. Petition at 1. Petitioner thereafter suffered from a number of conditions, the most troublesome of which are daily painful and itchy hives, injuries which Petitioner alleges were caused by the Gardasil vaccinations.

Petitioner received her first Gardasil immunization on December 29, 2011. See Pet. Ex. 1 at 19-22. She was described as alert and cooperative and was receiving counseling without any

[3] Petitioner was a minor at the time of the filing, so her mother filed the action on her behalf. Once she reached the age of majority, the caption was amended on January 5, 2016 to name Michaela Waterman as the only petitioner. Order, ECF No. 55, 56.

[4] Exhibit numbers used in this Ruling for Petitioner's exhibits are from Petitioner's Amended Exhibit List filed February 24, 2014.

current medication for her depression. *Id*. She was otherwise healthy. *Id*. Within "a month or so" after administration of the first vaccination, Petitioner developed a red bubbly rash with a burning sensation on her abdomen and back. Tr. 17; Pet. Ex. 1 at 23-24. A couple of days later, when the rash "had gotten a lot worse," Petitioner sought out medical attention from her primary care provider ("PCP"), Dr. Laurie Huntress, at Turner Health Center, on January 28, 2012. Tr. 18, Pet. Ex. 1 at 23-24. She was prescribed Valtrex (Valacyclorvir HCl) for treatment of "likely" shingles. Pet. Ex. 1 at 24.

Petitioner was given the second Gardasil injection on February 29, 2012. Pet. Ex. 1 at 26. Approximately three months later, on June 5, 2012, Petitioner again visited Turner Health Center, this time complaining of "getting hives on a regular basis," with occurrences "a couple of times per week." *Id.* at 27. Antihistamine treatment was recommended, and Petitioner was referred to an allergist. *Id*. at 28.

Petitioner saw the allergist, Dr. Andrew B. Carey, on June 28, 2012. Pet. Ex. 4. Dr. Carey noted that Petitioner's hives had persisted for four months, and that the hives were more prominent two weeks after the second Gardasil vaccination was administered. Pet. Ex. 4 at 2-4. "Cutaneous testing by the prick method to relevant allergens including foods, latex, dust mite, animal dander, mold, and pollen was negative." *Id.* at 3. Dr. Carey's impression remarks included "[c]onsider a role for Gardisil (sic) although there is no available testing for this." *Id.* Dr. Carey diagnosed Petitioner with chronic urticaria[5] and placed her on antihistamine therapy. *Id.* at 3. "A panel of hive related labs was ordered including a CU index and thyroid antibodies." *Id*. at 4. Dr. Carey reviewed the risks and benefits of Gardasil injections with Petitioner and her mother and noted that "mother indicates that the patient does clearly need this" and that "[i]n her case, her benefits likely outweigh the risks." *Id.*

Petitioner received her third Gardasil immunization on July 11, 2012. Pet. Ex. 1 at 30. Dr. Carey saw her (accompanied by her mother) the following day and reported that the hives were still occurring, but were "70% improved" with regular antihistamine use. Pet. Ex. 4 at 5.

Petitioner visited her primary care physician at Turner Health Center on August 15, 2012 with complaints of skin rashes that were described as "erythematous macular patches with visible collarettes and some central clearing," with unknown etiology. Pet. Ex. 1 at 32. Petitioner returned to Turner Health Center a week later, on August 21, 2012, with a recurring sore throat and pruritic rash on her hands, but no febrile presentation. *Id.* at 35. Petitioner was referred to another allergist on September 10, 2012, after her mother called Petitioner's PCP to express her discontent with the allergist and her concern about the injuries being an immune

[5] Urticaria is "vascular reaction in the upper dermis, usually transient, consisting of localized edema caused by dilatation and increased capillary permeability with wheals." *Dorland's Illustrated Medical Dictionary* (32d. 2012) (hereinafter "*Dorland's*").

system issue. Pet. Ex. 1 at 40. On September 25, 2012, Petitioner was admitted to the emergency room complaining of a rash, where the attending physician noted that "this was likely an allergenic versus a rheumatoid issue" and that "the parent is professing frustration with the care that so far her child has received." Pet. Ex. 6 at 2. During this visit, a routine serology-immunology test was performed for detecting autoimmune disease. Pet. Ex. 6 at 6. The tests came back negative with no mention of visible joint inflammation. *Id.*

On September 27 and 28, 2012, Petitioner saw the second allergist, Dr. Michael Lunn, whose physical examination revealed chronic urticaria "recalcitrant to multiple antihistamines." Pet. Ex. 5 at 4. Dr. Lunn noted the lab work ordered by Dr. Carey, including a complete blood count with differential, sedimentation rate, and liver function tests, all of which were normal. See Pet. Ex. 5 at 1. The history set forth by Dr. Lunn was consistent with that noted by other providers, including shingles one month after the first vaccine, diffuse hives approximately one month after the second, and chronic urticaria, bruising, joint pains in her hands, feet and knees without visible synovial swelling, fatigue, and headaches, beginning approximately three to four weeks after the final vaccination. *Id.* at 1- 4. Dr. Lunn diagnosed Petitioner with "Urticaria: Likely idiopathic," and stated that "[a]lthough there is a temporal relationship between the injection and the onset of her current symptoms, it was discussed extensively that there is no way to say with certainty that the vaccine itself was the culprit for her urticaria." *Id.* at 3-4.

Because Petitioner's physician questioned the possibility of rheumatoid arthritis, Petitioner also saw a rheumatologist, Dr. Lee Kendall, on October 2, 2012. *See generally* Pet. Ex. 3. Dr. Kendall stated that it was unlikely that Petitioner's condition was inflammatory arthritis. *Id.* at 3. He also noted that "the fact that . . .her symptoms occurred about a month after getting the Gardisil (sic) would argue against this being an immediate hypersensitivity type reaction" but that "[w]hether the reaction is related to the Gardisil (sic) is not entirely clear." *Id.*

Finally, on October 15, 2012, Petitioner saw a third allergist, Dr. Ari Fried, at Boston Children's Hospital, who noted that the previous skin biopsy taken by Dr. Carey was consistent with urticaria that did not have features of vasculitis. Pet. Ex. 2 at 2. Dr. Fried noted that "[s]teroid bursts have led to complete resolution of all her skin and other symptoms. However, when discontinued symptoms recur." *Id.* at 1. He stated that the idiopathic urticaria seen with Petitioner was a "condition for which the causes are still not well known in most patients." *Id.* Dr. Fried ruled out hypersensitivity reaction to the Gardasil vaccine but noted that, given the time course and presentation of Petitioner's condition, a relationship between the vaccination and a possible elicited immune response "cannot be ruled out with certainty." *Id*. at 3. Dr. Fried recommended long-term antihistamines, as well as counseling to help Petitioner address the emotional distress her condition had caused her. *Id.*

B. Resolution of Disputed Factual Issue – Onset Following Second Vaccination

Respondent challenged the timing of onset of Petitioner's hives after the second Gardasil injection, asserting that the passage of approximately two months from when the hives allegedly started to when Petitioner sought treatment for them was "distinctly unusual" and cast doubt on the timing of onset. *See, e.g.*, Resp. Ex. A at 5. Petitioner's testimony at hearing addressed the discrepancy. She stated that when the hives first started in early April, she did not tell her mother at first, because she had a trip planned to New York with her grandparents to celebrate her April 3rd birthday. Tr. 21-24. She did eventually tell her mother, the day before she left for New York, and her mother told her to "just wait it out." Tr. 24-25. While in New York, she tried several different treatments, including calamine lotion and gel and Benadryl, which did not help. *Id.* When she returned from New York, she discussed the issue with her mother again. Her mother told her "that when she was younger. . .she had some hives and it was just from whatever and that I should just wait it out because it's just hives, it's not like I'm sick or anything, you know? And she didn't have too much money at the time, so we kind of waited it out and it got worse." Tr. 26. Finally, Petitioner testified that her mother was preoccupied with caring for a friend dying from cervical cancer, so Petitioner tried not to "bug" her and just live with it, although her mother did take her lotions and makeup away from her after noticing the hives, apparently thinking the lotions and make-up might be the source of the irritation. Tr. 28-29. Finally, Petitioner testified, "I was at my school and I had a bunch of hives during my math class and some people had been making comments about it, and I said, mom, I need to go to the doctor's and get this fixed," tr. 29, but the doctor was booked, "[s]o I think it was like a week after I had told her that we went." Tr. 30. This account was essentially confirmed by Petitioner's mother during her hearing testimony, including that the witness had a number of other responsibilities for patients and a dying friend and an ill family member, and that Petitioner is "kind of a tough kid, you know. . . and it was just she kind of dealt with it." Tr. 80-84.

The undersigned finds this testimony credible. In addition it is consistent with the contemporaneous medical records, including those of Dr. Carey, Pet. Ex. 4 at 2-4, and Dr. Lunn, Pet. Ex. 5 at 4. Therefore, the undersigned **FINDS** that the onset of hives after the second Gardasil vaccination dated February 29, 2012, occurred no later than the end of March or the first week of April 2012.

II EXPERT QUALIFICATIONS

A. Petitioner's Expert: David Axelrod, M.D.

David Axelrod, M.D., testified on behalf of Petitioner. *See* Tr. at 5. Dr. Axelrod attended the University of Michigan for both his undergraduate and medical degrees, which were

awarded in 1974. Pet. Ex. 20 at 1. He also earned a Master's Degree from the University of Michigan School of Public Health in 1991. *Id.* Dr. Axelrod was a Fellow in allergy, immunology, rheumatology, and medical laboratory immunology at McGill University-Royal Victoria Hospital from 1978 to 1980, and a Medical Staff Fellow at the National Institutes of Health Laboratory of Clinical Immunology from 1980-1982. *Id.* He holds a number of certifications and memberships in medical associations, and is licensed to practice medicine in Michigan, New Jersey, and Pennsylvania. *Id.* at 3. He has been in practice with Allergy & Asthma Consultants, Inc., in York, Pennsylvania, since December 2012. *Id.*

B. Respondent's Expert: Shelby H. Josephs, M.D.

Shelby H. Josephs, M.D., testified on behalf of Respondent. Tr. at 3. Dr. Josephs earned his B.A. in Biology from the University of Pennsylvania in 1971 and his medical degree from Duke University School of Medicine in 1975. Resp. Ex. B. at 1. He returned to Duke University as a Fellow in Pediatric Allergy, Immunology, and Pulmonary disease from 1977-1979. *Id.* He is board certified by the Boards of Pediatrics and Allergy and Immunology, and is licensed to practice medicine in the District of Columbia, Maryland, and Virginia. *Id.* Dr. Josephs is currently in private practice, specializing in pediatric and adult allergy, asthma, and clinical immunology. *Id.* at 2. He has served as a consultant to the U.S. Department of Health and Human Services Vaccine Injury Compensation Program since 2008. *Id.* Dr. Josephs was admitted at hearing as an expert in allergy and immunology. Tr.173.

III LEGAL STANDARD

To receive compensation under the Program, Petitioner must prove either 1) that she suffered a "Table Injury" — i.e., an injury falling within the Vaccine Injury Table[6] — corresponding to one of her vaccinations, or 2) that Petitioner suffered an injury that was actually caused by a vaccine. *See* 42 U.S.C.A. § 300aa-13(a)(1)(A); *see also* § 300aa-11(c)(1). Petitioner must show that the vaccine was "'not only a but-for cause of the injury but also a substantial factor in bringing about the injury.'" *Moberly v. Sec'y of Health & Human Servs.*, 592 F.3d 1315, 1321-22 (Fed. Cir. 2010) (quoting *Shyface v. Sec'y of Health & Human Servs.*, 165 F.3d 1344, 1352-53 (Fed. Cir. 1999)). Petitioner has not claimed a Table Injury, and an examination of the record has not revealed any possible Table Injury.

[6] The Vaccine Injury Table "lists the vaccines covered under the Act; describes each vaccine's compensable, adverse side effects; and indicates how soon after vaccination those side effects should first manifest themselves. Claimants who show that a listed injury first manifested itself at the appropriate time are prima facie entitled to compensation." *Bruesewitz v. Wyeth, LLC*, 562 U.S. 223, 228 (2011) (citing 42 U.S.C.A. §§ 300aa-11(c) (1), 300aa-13(a)(1)(A)).

Absent a Table Injury, Petitioner must satisfy all prongs of the test established by the Federal Circuit in *Althen v. Secretary of the Department of Health and Human Services*. 418 F.3d 1274, 1278-79 (Fed. Cir. 2005). The *Althen* test requires the petitioners to set forth: "(1) a medical theory causally connecting the vaccination and the injury ("*Althen* Prong One"); (2) a logical sequence of cause and effect showing that the vaccination was the reason for the injury ("*Althen* Prong Two"); and (3) a showing of a proximate temporal relationship between vaccination and injury ("*Althen* Prong Three")." *Id.* To establish entitlement to compensation under the Program, a petitioner is required to establish each of the three prongs of *Althen* by a preponderance of the evidence. *Id.*

The preponderance of the evidence standard has been interpreted to mean that the petitioner must show that the fact is more likely than not. *Moberly*, 592 F.3d at 1322 n. 2 (Fed. Cir. 2010). Proof of medical certainty is not required. *Bunting v. Sec'y of Health & Human Servs.*, 931 F.2d 867, 873 (Fed. Cir. 1991). "[T]he purpose of the Vaccine Act's preponderance standard is to allow the finding of causation in a field bereft of complete and direct proof of how vaccines affect the human body." *Althen*, 418 F.3d at 1280.

In determining whether Petitioner is entitled to compensation, the undersigned will consider all relevant, material contained in the record. 42 U.S.C.A. § 300aa-13(b)(1). That material can include circumstantial evidence. *Capizzano v. Sec'y of Health & Human Servs.*, 440 F.3d 1317, 1325 (Fed. Cir. 2006). As the finder of fact, the undersigned is "entitled—indeed, expected—to make determinations as to the reliability of the evidence presented…and, if appropriate, as to the credibility of the persons presenting that evidence." *Moberly*, 592 F.3d at 1326. The Vaccine Act was created to award compensation to vaccine-injured persons "quickly, easily, and with certainty and generosity." *Graves v. Sec'y of Health & Human Servs.*, 109 Fed. Cl. 579, 595 (2013) (quoting H.R. Rep. No. 99-908 at 3). Therefore, "close calls regarding causation are resolved in favor of injured" petitioners. *Althen*, 418 F.3d at 1280; *see also Shyface v. Sec'y of Health & Human Servs.*, 165 F.3d 1344, 1352-53 (Fed. Cir. 1999).

If Petitioner satisfies all three prongs of *Althen* by a preponderance of the evidence, she establishes a *prima facie* case. *Walther v. Sec'y of Health & Human Servs.*, 485 F.3d 1146, 1149-51 (Fed. Cir. 2007). After Petitioner has established a *prima facie* case, the burden shifts to Respondent to demonstrate, also by a preponderance of the evidence, that the injury was actually caused by factors unrelated to the administration of the vaccine. *Walther*, 485 F.3d at 1151; 42 U.S.C.A. § 300aa–13(a)(1)(B). Accordingly, "[i]f the evidence is seen in equipoise, then the government has failed in its burden of persuasion and compensation must be awarded." *Knudsen v. Sec'y of Health & Human Servs.*, 35 F.3d 543, 550 (Fed. Cir. 1994).

To satisfy the first prong of the *Althen* test, Petitioner must provide "a medical theory causally connecting the vaccination and the injury." *Althen*, 418 F.3d at 1278 (quoting *Grant v.*

Sec'y of Health & Human Servs., 956 F.2d 1144, 1148 (Fed. Cir. 1992)). Petitioner's theory must show that it is more likely than not that the vaccine she received "can" cause the type of injury Petitioner alleges the vaccine caused. *Pafford v. Sec'y of Health & Human Servs.*, 451 F.3d 1352, 1355-57 (Fed. Cir. 2006).

The medical theory set forth by the Petitioner must be "legally probable, not medically or scientifically certain." *Knudsen*, 35 F.3d at 548-49 (citations omitted). However, the theory cannot be baseless or completely speculative; it must be informed by "sound and reliable medical or scientific explanation." *Id.* at 548 (citations omitted)*; see also Veryzer v. Sec'y of Health & Human Servs.*, 98 Fed. Cl. 214, 223 (2011) (noting that under 42 U.S.C.A. § 300aa-13(b)(1) and Vaccine Rule 8(b)(1), special masters must consider only evidence that is both "relevant" and "reliable"). When a petitioner proffers a medical opinion to support her theory, the basis for the opinion and the reliability of that basis must be considered in determining how much weight to afford the offered opinion. *See Broekelschen v. Sec'y of Health & Human Servs.*, 618 F.3d 1339, 1347 (Fed. Cir. 2010) ("The special master's decision often times is based on the credibility of the experts and the relative persuasiveness of their competing theories.")(citations omitted); *Perreira v. Sec'y of Health & Human Servs.*, 33 F.3d 1375, 1377 n. 6 (Fed. Cir. 1994) ("An expert opinion is no better than the soundness of the reasons supporting it") (citing *Fehrs v. United States*, 620 F.2d 255, 265 (Ct. Cl. 1980)).

To satisfy the second prong of the *Althen* test, Petitioner must establish "'a logical sequence of cause and effect showing that the vaccination was the reason for the injury.'" *Althen*, 418 F.3d at 1278 (citations omitted). That is, Petitioner must show, by preponderant evidence, that the vaccination Petitioner received *did* cause the injuries she alleges they caused. *Capizzano v. Sec'y of Health & Human Servs.*, 440 F.3d 1317, 1326 (Fed. Cir. 2006). Petitioner may satisfy her burden by presenting circumstantial evidence and reliable medical opinions; she is not required to offer "epidemiologic studies, rechallenge, the presence of pathological markers or genetic disposition, or general acceptance in the scientific or medical communities to establish a logical sequence of cause and effect." *Id.* at 1325.To satisfy the third prong of *Althen*, petitioners must produce preponderant evidence of "a proximate temporal relationship between vaccination and injury." *Althen*, 418 F.3d at 1278. This prong helps to establish the connection between the causal theory of Prong One and the more fact-based cause and effect arguments of Prong Two by demonstrating "that the onset of symptoms occurred within a timeframe from which, given the medical understanding of the disorder's etiology, it is medically acceptable to infer causation-in-fact." *de Bazan v. Sec'y of Health & Human Servs.*, 539 F.3d 1347, 1352 (Fed. Cir. 2008). Petitioner may meet her timing burden by showing: (1) when the condition for which she seeks compensation first appeared after vaccination, and (2) whether the period of symptom onset is "medically acceptable to infer causation." *Shapiro v. Sec'y of Health & Human Servs.*, No. 99-552V, 2011 WL 1897650, at *13 (Fed. Cl. Spec. Mstr. Apr. 27, 2011)(citation omitted), aff'd in relevant part and vacated on other grounds, 101 Fed. Cl. 532, 536 (2011).

IV ANALYSIS

"Proof of a medical theory explaining how a vaccine could cause an injury is analytically distinct from proof that a vaccine actually did cause the injury." *Nussman v. Sec'y of Health & Human Servs.*, 83 Fed. Cl. 111, 121 (July 21, 2008). However, evidence used to satisfy one prong of *Althen* may be used to satisfy *Althen's* other prongs, as well. *Capizzano v. Sec'y of Health & Human Servs.*, 440 F.3d 1317, 1326 (Fed. Cir. 2006).

Both experts agreed that chronic urticaria is very often idiopathic, that is, its cause is unknown. Pet. Ex. 21 at 1; Tr. 174. Petitioner conceded that there are also no studies or articles directly linking the Gardasil vaccine with chronic urticaria, although there are VAERS[7] reports of urticaria, *see, e.g.* Pet. Ex. 11,[8] and pruritic[9] rashes are listed on the Gardasil package insert as a possible side effect. *See* Ct. Ex. 1[10]) However, Dr. Axelrod argued, through presentation of several articles, that chronic urticaria has been demonstrably linked to the ingestion or injection of other drugs and vaccines.[11] Pet. Ex. 8 at 2. Dr. Axelrod also presented the Lawley article

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[7] VAERS ("Vaccine Adverse Events Reporting System") is a database created by the FDA and the Centers for Disease Control and Prevention to receive reports about adverse events which may be associated with vaccines. *See* Vaccine Adverse Event Reporting System, available at https://vaers.hhs.gov/about/index. *See also Nance v. Sec'y of Health & Human Servs.*, No. 06-0730V, 2010 WL 3291896, at *9 (Fed. Cl. Spec. Mstr. July 30, 2010) (discussing that VAERS is a surveillance system that accepts "voluntarily submitted" reports of events from manufacturers, health care workers and patients, and that the experiences reported therein are unsolicited and reflect a "concern of a possible relationship to vaccination").

[8] Slade, B.A., et al., *Postlicensure Safety Surveillance for Quadrivalent Human Papillomavirus Recombinant Vaccine*. JAMA. 2009, Aug. 19 (reprint); 302(7): 750-57.

[9] Pruritic is "pertaining to or characterized by pruritus." Pruritis is "an unpleasant cutaneous sensation that provokes the desire to rub or scratch the skin to obtain relief. Called also *itching*." *Dorland's*, p.1540

[10] Ikeya, S., et al., *Linear IgA bullous dermatosis following human papillomavirus vaccination*. Eur. J. Dermatol. 2012; 22(6): 787-88.

[11] Hennino, A., et al., *Pathophysiology of Urticaria*. Cln. Rev. Allerg. Immun., 2006. 30(1): 3-11. Pet. Ex.12.

Jerne, N.K., *Towards a Network Theory of the Immune System*. Annales d'immunologie. 1974: 125C (1-2): 373-89. Pet. Ex. 14.
Lazarou, J., et. al., *Incidence of Adverse Drug Reactions in Hospitalized Patients: A Meta-Analysis of Prospective Studies*. The Journal of the American Medical Association, 1998. 279(15): 1200-5. Pet. Ex. 18

concerning serum sickness caused by vaccination with horse antithymocyte globulin,[12] as support for his theory that immune complexes can be induced by vaccines, that immune complexes can cause autoimmune disease symptoms consistent with chronic urticarial, and that that is what happened to Petitioner. Pet. Ex. 8 at 2-3; Tr. 148 ("Given what happened to her after the third injection, she may very well have developed a form of serum sickness, you know. . .that could very well have been an immune complex reaction.")

Petitioner's primary causation argument, however, was based on the concept of challenge-rechallenge. "A rechallenge event occurs when a patient who had an adverse reaction to a vaccine suffers worsened symptoms after an additional injection of the vaccine." *Capizzano,* 440 F.3d at 1322. *See also Nussman*, 83 Fed. Cl. At 120 ("'challenge-rechallenge happens when a person (1) is exposed to one antigen, (2) reacts to that antigen in a particular way, (3) is given the same antigen again, and (4) reacts to that antigen similarly.' (citation omitted) Typically, the second reaction is faster and more severe.") Challenge-rechallenge is an accepted scientific principle in Dr. Axelrod's field of expertise. Tr. 152; *see also* tr.189 (Dr. Josephs).

Dr. Axelrod testified, and the medical records showed, that the degree of Petitioner's reaction escalated after each consecutive dose of the vaccine: it "occurred maybe a little bit sooner and it was more aggressive." Tr. 156. Further, he argued, there was no other "potential insult to cause it." *Id.; see also* Pet. Ex. 4 at 3 (testing to "relevant allergens. . .was negative"). Both Dr. Lunn and Dr. Fried acknowledged the temporal relationship between the vaccinations and the onset of Petitioner's urticaria. Pet. Ex. 5 at 3-4; Pet. Ex. 2 at 3. This testimony, Petitioner argued, shows that the Gardasil vaccines did cause her urticarial, as required by *Althen* prong two. Petitioner also argued that, under the challenge-rechallenge paradigm, evidence that shows that the vaccine did cause the injury, by implication also proves that the vaccine can cause the injury, as required by *Althen* prong one. Petitioner's Prehearing Submissions at 6.

Lund, J.J., et. al., *Drug induced bullous sweet syndrome with multiple autoimmune features.* Autoimmune Diseases. 2010; 2010:1-4. Pet. Ex. 13.
Nasibitt, D.J., et al., *Immunological Principles of Adverse Drug Reactions: The Initiation and Propagation of Immune Responses Elicited by Drug Treatment*. Drug Safety. 2009 Dec; 23(6): 483-507. Pet. Ex. 16.
Pichler, W.J., *Pharmacological Interaction of Drugs with Antigen-Specific Immune Receptors: The P-I Concept*. Curr. Opin. Allergy and Cln. Immun., 2002. 2(4): 301-5. Pet. Ex. 19.
Rieder, M.J., *Mechanisms of Unpredictable Adverse Drug Reactions*. Drug Safety. 1994; 11(3): 196-212. Pet. Ex. 17.
Wood, R., et al., *An Algorithm for Treatment of Patients With Hypersensitivity Reactions After Vaccines*. Pediatrics, 2008. 122(3): e771-777. Pet. Ex. 10.

[12] Lawley, t., et al., *A Prospective Clinical and Immunologic Analysis of Patients with Serum Sickness.* New Engl. J. Med. 1984, Nov. 29; 311(22): 1407-1413.

Respondent, through Dr. Josephs, questioned all of the articles Dr. Axelrod relied upon as inapposite. Resp. Ex. A at 3-4; tr. 190-92. Respondent pointed out that Petitioner did not suffer from serum sickness, Tr. 190, nor was she vaccinated with horse serum, or any of the vaccines noted in the articles cited by Dr. Axelrod. Resp. Ex. A at 3-4; tr. 190-92. Respondent also emphasized that the rash from which Petitioner suffered after her first HPV vaccine was diagnosed and treated as shingles arising from a previous chickenpox infection, and therefore it could not serve as the first event in a challenge-rechallenge sequence. Resp. Ex. A at 3; tr. 182-184. Finally, Respondent challenged the time of the onset of Petitioner's symptoms after the second vaccine, an issue which has been resolved earlier in this Ruling.

From the undersigned's perspective, this is a classic case of challenge-rechallenge. The undersigned understands that the rash Petitioner experienced after the first HPV vaccine was diagnosed as shingles. However, as Petitioner testified:

> "The nurse – well, the nurse practitioner or the first person to come in the room told me that I was only – I think it was like – she said that being that young, she didn't think it was shingles. And then the doctor came in and said – and then looked at it and said, the only reason I wouldn't think it was shingles is because it's not scaly, but I think it's basically shingles. She kind of was looking at it and pressing her hands along the side to see if it was along the same nerve and said, it's likely shingles, I would think that's what it is."

Tr. 19. In light of what came later this does not appear to be a definitive diagnosis, but a diagnosis of first impression, as the most logical explanation of the problem at the time. No testing was done to confirm the Zoster diagnosis. The undersigned's review of the medical records did not disclose that any treating physician went back to that first rash to reexamine its genesis in light of Petitioner's subsequent development of hives, and ultimately of chronic urticaria.[13] And in every other way, the development of Petitioner's condition "fit[s] within the challenge-rechallenge paradigm." *Nussman v. Sec'y of Health & Human Servs.*, 83 Fed. Cl. 111, 120 (July 21, 2008). *See also Capizzano v. Sec'y of Health & Human Servs.,* 440 F.3d 1317, 1322 (Fed. Cir. 2006). Temporally, the "shingles" rash developed three weeks to a month after the first vaccine, Pet. Ex. 1 at 23-24; the worsening hives and welts approximately one month

[13] *See, e.g.,* Pet. Ex. 4 at 1, wherein Dr. Carey noted that Petitioner had shingles after the first vaccination, and that that "would be a different immune mechanism than hives," but did not question whether, in light of the further disease development experienced by Petitioner post-vaccination, the shingles may have been a misdiagnosis of the first rash; Pet. Ex. 5 at 1, wherein Dr. Lunn noted the first vaccination and "approximately one month later she developed a Zoster infection of her abdomen." While Dr. Lunn noted that Petitioner's Zoster was treated with antivirals "although it was uncertain whether the injection itself was the culprit for the Zoster infection," he did not question the nature of the rash as being other than Zoster.

after the second vaccine, *see infra*, at 4-5; and the third, most virulent, chronic urticaria, and the joint pain, approximately three to four weeks after the final vaccine. Tr. 36-37. This is internally consistent with the challenge-rechallenge paradigm, and also fits within the timeframe that Dr. Axelrod testified was appropriate for the development of the underlying immunological process he theorized is causing Petitioner's condition. The condition also worsened with each additional dose of the vaccine: each time the basic reaction started as a rash; after each of the second and third rechallenge events, the rash became worse – more itchy, more painful, more extensive. Tr. 36-38, 152, 156.

Even if the "shingles" was in fact shingles, and related to the first vaccination only by coincidence, the undersigned would still find the challenge-rechallenge theory persuasive here. The hives that arose three to four weeks after the second vaccination were "70% resolved" with use of antihistamines as noted by Dr. Carey when he saw Petitioner the day after the administration of the third vaccination, Pet. Ex. 4 at 5; three to four weeks later, the urticaria was back, with a vengeance, and was recalcitrant to antihistamines. Pet. Ex. 5 at 4.

Although the undersigned does not have "evidence of 'rechallenge' in other injectees," as the special master did in *Capizzano*, 440 F.3d at 1322, the undersigned nevertheless concludes that the evidence cited above constitutes "'such strong proof of causality that it is unnecessary to determine the mechanism of cause—it is understood to be occurring,'" *id. (*citations omitted), which satisfies the first prong of *Althen.*

"Proof of a medical theory explaining how a vaccine could cause an injury is analytically distinct from proof that a vaccine actually did cause the injury." *Nussman v. Sec'y of Health & Human Servs.*, 83 Fed. Cl. 111, 121 (July 21, 2008). However, evidence used to satisfy one prong of *Althen* may be used to satisfy *Althen*'s other prongs, as well. *Capizzano v. Sec'y of Health & Human Servs*., 440 F.3d 1317, 1326 (Fed. Cir. 2006). As noted above, the challenge-rechallenge evidence presented by Petitioner also satisfies the second, logical cause and effect prong of *Althen*, and temporally, the evidence fits with the theory of causation set forth by Petitioner and with the challenge-rechallenge paradigm, and therefore also satisfies prong three of *Althen.*

V CONCLUSION

For the reasons set forth above, the undersigned finds that Petitioner has shown by medical records and competent medical opinion that her alleged medical condition was "more likely than not" vaccine-caused, and that she is entitled to compensation. This case is now ready to proceed in damages.

IT IS SO ORDERED.

s/Lisa D. Hamilton-Fieldman
Lisa D. Hamilton-Fieldman
Special Master