In the United States Court of Federal Claims

OFFICE OF SPECIAL MASTERS
No. 16-697V
(to be published)

KENDALL REICHERT,	*	
	*	Special Master Corcoran
Petitioner,	*	
	*	Dated: August 2, 2018
v.	*	
	*	Entitlement; Vaccine Injury;
	*	Guillain-Barre Syndrome ("GBS");
SECRETARY OF HEALTH AND HUMAN SERVICES,	*	Influenza ("flu") Vaccine; Onset.
	*	
Respondent.	*	
	*	

Chris J. Webb, Black McLaren Jones Ryland & Griffee, P.C., Memphis, TN, for Petitioner.

David G. Cutler, U.S. Dep't of Justice, Washington, DC, for Respondent.

DECISION DENYING ENTITLEMENT[1]

On June 14, 2016, Kendall Reichert filed a petition seeking compensation under the National Vaccine Injury Compensation Program ("Vaccine Program").[2] The Petition alleges that he suffered from Guillain-Barré syndrome ("GBS") as a result of receiving the influenza ("flu") vaccine on October 22, 2014.

I held an entitlement hearing on April 6, 2018, in Washington, DC. For the reasons set forth below, I hereby DENY entitlement in this case. Petitioner did not preponderantly establish

[1] This Decision will be posted on the Court of Federal Claims' website in accordance with the E-Government Act of 2002, 44 U.S.C. § 3501 (2012)). **This means that the Decision will be available to anyone with access to the internet.** As provided by 42 U.S.C. § 300aa-12(d)(4)(B), however, the parties may object to the Decision's inclusion of certain kinds of confidential information. Specifically, under Vaccine Rule 18(b), each party has fourteen 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 whole Decision will be available to the public. *Id.*

[2] The Vaccine Program comprises Part 2 of the National Childhood Vaccine Injury Act of 1986, Pub. L. No. 99-660, 100 Stat. 3758, codified as amended at 42 U.S.C. §§ 300aa-10 through 34 (2012) [hereinafter "Vaccine Act" or "the Act"]. Individual section references hereafter will be to § 300aa of the Act (but will omit that statutory prefix).

that the timeframe in which his GBS occurred (seventy-two days, or more than ten weeks, post-vaccination) was medically appropriate for purposes of establishing vaccine causation.

I. Factual Background

The record in this case consists of Mr. Reichert's medical records, the testimony of two experts, and medical or scientific literature submitted by the parties in support of their respective positions. I have reviewed the entire record as required by the Vaccine Act.

October 2014 Flu Vaccination and Subsequent Development of GBS

Petitioner received the flu vaccine in Joppa, Illinois, on October 22, 2014. Ex. 2 at 1. At the time of vaccination, he was fifty-five years old and generally healthy. *Id.* No adverse reactions were noted at the time of vaccine administration. Following vaccination, Petitioner did not present for medical care for any reason until early January 2015 (nearly three months from the date of vaccination), and there is no documented medical record evidence of any reaction to receipt of the vaccine. *See generally* Ex. 3.

Roughly one month prior to his receipt of the flu vaccine, Mr. Reichert suffered from a urinary tract infection ("UTI") in September 2014. Ex. 3 at 33, 41. His on-going health issues also included benign prostatic hypertrophy, benign prostatic hyperplasia, hypertension, chronic bronchitis, reflux, hyperlipidemia, nicotine dependence, obesity, paroxysmal tachycardia, rectal pain, sleep apnea, urinary frequency, and history of vasovagal syncope. *Id.* at 33, 37, 54-56.

On January 3, 2015 (seventy-two days post-vaccination), Mr. Reichert reported to the emergency room at Baptist Hospital in Paducah, Kentucky, with complaints of bilateral numbness in his fingers and toes beginning that same day. Ex. 4 at 2-3. Petitioner reported specifically that he had not experienced similar symptoms in the past. *Id.* Upon examination, the attending physician noted that Mr. Reichert was alert and oriented with normal mobility. *Id.* at 3. Office notes revealed he specifically denied weakness, tingling, impaired speech, or dizziness. *Id.* An MRI performed during the visit also revealed normal imaging results. *Id.* at 5. Mr. Reichert was ultimately diagnosed with paresthesia and hypertension. *Id.* Upon discharge, he was instructed to maintain a low sodium diet and to follow-up with his doctor as needed. *Id.* at 33.

Two days later, on January 5, 2015, Petitioner went to his primary care physician ("PCP"), Dr. Richard Smith, at Jackson Purchase Medial Associates in Paducah, Kentucky. Ex 3. at 23-26. He was specifically seen by Ms. Brittney Hunter, a physician's assistant. During the visit, Mr. Reichert complained of continued paresthesia in his hands and feet. *Id.* at 23. He also reported light-headedness, dizziness, and headaches. *Id.* Upon examination, Ms. Hunter assessed Mr. Reichert with right posterior chest, scapular pain (that worsened with sitting and laying down). *Id.* Mr. Reichert denied shortness of breath, urinary problems, or any other chest concerns during the

visit. *Id.* Ms. Hunter advised him to continue taking his current medications and monitor his blood pressure. *Id.*

On January 6, 2015, Petitioner visited Dr. Dewey Dixon, a chiropractor at Dixon Chiropractic in Mounds, Illinois, with continued complaints of numbness in his fingers, hands, and feet beginning on January 3, 2015. Ex. 5 at 1. He also reported right shoulder blade pain and gait problems. *Id.* An examination revealed absent or reduced patellar and Achilles reflexes. *Id.* at 1. Dr. Dixon treated Mr. Reichert and recommended a follow-up appointment in two weeks. *Id.* Following the examination, it appears from the record that Dr. Dixon opined Mr. Reichert might have some form of a spinal cord disease (or injury), and recommended that Mr. Reichert seek further treatment. *Id.* at 1.

Acting on Dr. Dixon's advice, Mr. Reichert presented to Southeast Missouri Hospital ("Southeast") in Cape Girardeau, Missouri, that same day (January 6th) with complaints of numbness, tingling, bilateral weakness, difficulty walking, and reduced motor skills "of five days duration." Ex. 6 at 5. He denied any recent history of fever, viral illness, or flu-like symptoms. *Id.* The treating physician, Dr. Venu Chirunomula, examined Mr. Reichert and noted that he had no symptoms suggestive of dysphagia, dysarthria, or facial weakness, but voiced concerns about a generalized loss of strength. *Id.* Following a physical examination, Dr. Chirunomula opined that Petitioner's symptoms were consistent with GBS (perhaps in an atypical presentation similar to Miller-Fisher syndrome[3]) and right-side Bell's palsy.[4] *Id.* at 3, 6. Dr. Chinrunomula eliminated the diagnosis of acute stroke as a possibility and arranged for a neurology consult. *Id.*

The next day, Dr. Laurence Kinsella conducted a neurological examination. Treatment notes state that Mr. Reichert was experiencing diminished arm and leg sensation, reduced arm strength, and a wide-based gait, along with a five-day history of symptoms beginning with bilateral tingling in the fingertips. Ex. 6 at 14. During the consultation, Mr. Reichert recalled (for the first time in the medical history) having a minor GI illness two days prior to onset. *Id.* A nerve conduction study of one arm and one leg, a lumbar puncture under fluoroscopic guidance, and a CPK blood test were ordered. *Id.* The lab tests revealed elevated levels of protein, glucose, and white blood cells. *Id.* at 69. An MRI revealed cervical spine disk bulges, but no abnormalities of the spinal cord signal or cord compression. *Id.* at 15. Given the course of his symptoms, Dr. Kinsella opined that Mr. Reichert was likely experiencing some form of GBS consistent with a Miller-Fisher variant. *Id.* Dr. Kinsella recommended that Petitioner begin IVIG[5] (50g) with

[3] Miller-Fisher syndrome is a variant of GBS characterized by areflexia, ataxia, and ophthalmoplegia. *Dorland's Illustrated Medical Dictionary* 1830 (32nd ed. 2012) (hereinafter "*Dorland's*").

[4] Bell's palsy is defined as "unilateral facial paralysis of sudden onset, due to lesion of the facial nerve" and results in characteristic distortion of the face. *Dorland's* at 208, 1365.

[5] Intravenous immunoglobulin ("IVIG") is a blood product used to treat patients with antibody deficiencies, including neurological disorders. *Clinical Uses of Intravenous Immunoglobulin*, NCBI (2005),

treatments five times daily. *Id.* Mr. Reichert was unable to tolerate the IVIG treatment due to cramping, however, necessitating some consideration of alternatives. Ex. 6 at 8-10, 67.

Petitioner was discharged from Southeast on January 16, 2015. Ex. 6 at 1-3. His final diagnosis included GBS and "mild" right-side Bell's palsy. *Id.* at 3. Upon discharge, Petitioner had essentially normal strength and gait. *Id.* He was instructed to continue blood pressure medications, to follow-up with both his PCP and neurologist, and to arrange outpatient physical and occupational therapy. *Id.* Hospital records make no mention of any reaction to the flu vaccine.

Petitioner continued to see his PCP and neurologist following discharge. Ex. 7 at 1-4; Ex. 3 at 7. Petitioner followed up with his treating neurologist, Dr. Randall Stahly, on January 19, 2015. The records from this visit indicate that Mr. Reichert was recovering well, but complained of lingering decreased endurance and a sense of fatigue. Ex. 7 at 1-4. Upon examination, Dr. Stahly noted a 5/5 strength in Petitioner's lower extremities. *Id.* Following this visit, Mr. Reichert followed up with his PCP, Dr. Smith, on January 20, 2015. Ex. 3 at 6-12. Dr. Smith noted that Mr. Reichert's reflexes remained abnormal, but that he had regained much of his strength in the upper and lower extremities. *Id.* at 8. Dr. Smith also noted that the majority of Mr. Reichert's labs returned normal results, although he continued to experience elevated blood pressure. *Id.* at 11. Petitioner was advised to follow-up in a month and begin physical therapy. *Id.*

In the interim, Petitioner began physical therapy at Union County Hospital in Anna, Illinois, on January 22, 2015. Ex. 8. He attended seven sessions until he was released from physical therapy on February 13, 2015, having met all of his therapy goals. *Id.* at 1-2. Upon discharge from therapy, Petitioner reported "no pain" and "very little numbness." *Id.* at 2.

A month later, Mr. Reichert followed up again with his neurologist, Dr. Stahly, on February 19, 2015, and PCP, Dr. Smith, on February 20, 2015, respectively. Ex. 7 at 5-7; Ex. 3 at 3-5. At his neurology appointment, Petitioner reported slight paresthesia, weakness, and pain related to his hospital course. On examination, he lacked ankle jerk reflexes. Dr. Stahly noted that Petitioner had "resolved totally other than a very slight paresthesia in the hands." Ex. 7 at 5. Dr. Stahly cleared Petitioner to return to work and advised him to give his symptoms a year to heal on their own. Ex. 3 at 4. The next day, Petitioner met with his PCP, Dr. Smith, who noted that Petitioner was doing quite well and regaining his strength. *Id.* The physical exam revealed no dysfunction, and displayed normal gait and reflexes. *Id.*

Eight months later, Petitioner returned to see Dr. Smith, on October 27, 2015, with complaints that his left arm was aching, and he believed it to be associated with his GBS. Ex. 3 at 111-14. He also reported ear and sinus symptoms. *Id.* Upon examination, Dr. Smith assessed Mr.

https://www.ncbi.nlm.nih.gov/pmc/articles/PMC1809480/ (lasted visited on July 27, 2018). It is commonly prescribed to treat diseases believed to be autoimmune in nature, increasing the effectiveness of an individual's immune response.

Reichert with chronic bronchitis, obesity, hypertension, and depression. *Id.* at 114. Dr. Smith prescribed Mucinex and Claritin for his sinus complaints, and recommended that he return for a visit the following spring. *Id.*

On January 8, 2016 (roughly one year following his GBS diagnosis), Petitioner returned to see his chiropractor, Dr. Dixon, with complaints of low back and right shoulder pain associated with his resolving GBS. Ex. 5 at 4, 12-13. Mr. Reichert reported that his pain increased when he raised his arms. *Id.* at 5. Dr. Dixon referred Petitioner to physical therapy to be treated as necessary. *Id.* at 11. Mr. Reichert returned for a follow-up physical therapy visit (at Dr. Dixon's direction) on February 5, 2016, reporting that he continued to experience problems related to GBS including sharp pain in his left arm and generalized weakness. *Id.* at 12. Mr. Reichert continued to attend physical therapy for several sessions during the remainder of February 2016. *Id.* at 12-18.[6]

Petitioner's Affidavits Regarding Health Course

In addition to the medical records discussed above, Petitioner offered two affidavits, dated June 12, 2016, and March 6, 2018, respectively, detailing the course of his treatment and health history following his receipt of the flu vaccine. *See* Affidavit, dated June 12, 2016, filed as Ex. 1 (ECF No. 5-1) ("Pet. First Aff."); Affidavit, dated Mar. 6, 2018, filed as Ex. 107 (ECF No. 45-1) ("Pet. Sec. Aff.").

Mr. Reichert's statements contained in his first affidavit are generally consistent with the medical record as discussed above. Petitioner offered statements in his second affidavit, however, relating to a possible post-vaccination exposure to the influenza wild virus.

According to the affidavit, Mr. Reichert believes he was exposed to a wild influenza virus on at least one occasion between his October 2014 flu vaccination and subsequent hospitalization. Pet. Sec. Aff. at 2. Mr. Reichert explained that his wife, a nurse, consistently interacted with patients exposed to the flu virus during the time period between his vaccination and hospitalization. *Id.* He further asserted that his son was ill with the flu during this same time period, and that he also interacted with various co-workers who may have also exposed him. *Id.* Despite these contentions, however, Mr. Reichert cited no record evidence supporting his assertion that he was exposed to the wild flu virus, or that he experienced any clinical symptoms associated with the flu. The filed medical records similarly are devoid of any indication he experienced any type of reaction to any virus, beyond a mild GI virus (which Mr. Reichert reported he experienced two days prior to the onset of his symptoms). *See* Ex. 6 at 14.

[6] The remainder of Petitioner's filed records are unrelated to his GBS diagnosis, and instead involve a 2011 sleep apnea study, his 2012 blood pressure diagnosis, and his various gastroenterology appointments ranging from 2013 to 2015. *See* Ex. 5 at 110, 102, 97, 29, 27. These records make no mention of any alleged vaccine injury.

II. Expert Testimony

A. *Petitioner's Expert – Dr. Eric Gershwin*

Dr. Gershwin authored one expert report and testified at hearing on Petitioner's behalf. *See* Expert Report, dated Nov. 30, 2016, filed as Ex. 9 (ECF No. 14-1) ("Gershwin Rep."); Transcript ("Tr.") at 4-61,125. Dr. Gershwin opined that the flu vaccine was a substantial causative factor in Mr. Reichert's development of GBS. Tr. 15.

Dr. Gershwin is board certified in allergy and immunology, rheumatology, and internal medicine, and is currently employed as chief of the Division of Rheumatology and Clinical Immunology and professor of medicine at University of California at Davis ("UC Davis"). Curriculum Vitae of Dr. Gershwin, filed as Ex. 10 (ECF No. 14-2) ("Gershwin CV"); Tr. at 6. Dr. Gershwin attended medical school at Stanford University after completing his bachelor's degree at Syracuse University. Gershwin CV at 1. He completed his internship and residency at Tufts New England Medical Center, and two fellowships in rheumatology and allergy/immunology at the National Institutes of Health. *Id.* at 2. His current duties include treating patients with autoimmune diseases, conducting research specializing in autoimmunity, and conducting clinical rounds. Tr. at 7. Dr. Gershwin estimates that he has seen around seventy or eighty GBS patients in his career at UC Davis. Tr. at 8. Dr. Gershwin also publishes extensively. He currently serves as the editor of the *Journal of Autoimmunity and Clinics Reviews in Allergy and Immunology*. Gershwin CV at 5.

At hearing, Dr. Gershwin began his testimony by briefly describing GBS as well as its clinical symptomology. Dr. Gershwin characterized GBS as an autoimmune disease in which the immune system essentially attacks components of the peripheral nerves, leading to acute (or "rapidly progressive") flaccid symmetrical weakness of the limbs. Tr. at 6; Gershwin Rep. at 1, 4; *see also* R. Hughes, et al., *Clinical and Epidemiologic Features of Guillain-Barré Syndrome*, 176 J. Infectious Diseases 92, 92 (1997), filed as Ex. 32 (ECF No. 18-4) ("Hughes"). Serum antiganglioside antibodies play a major role in the induction and perpetuation of GBS pathology. Gershwin Rep. at 3. The disease is diagnosed using an array of diagnostic testing (including a physical exam, CSF analysis, nerve conduction studies, and MRI imaging studies). *Id.* at 6.

Dr. Gershwin opined that although the precise trigger for the disease is unknown, GBS is likely most often triggered by a respiratory or gastrointestinal infection. Tr. at 18. He noted that over two-thirds of patients with GBS present with symptoms of respiratory or digestive infection within six weeks of onset. Gershwin Rep. at 2. The infecting agents are often Campylobacter, Cytomegalovirus, the Epstein-Barr virus, *mycoplasma pneumoniae*, Haemophilus influenza, and Influenza A virus. *Id.* Theoretically, however, any infection can cause the formation of GBS-related antibodies (i.e., a UTI). Tr. at 35, Gershwin Rep. at 2. He also acknowledged that vaccinations have been associated with GBS (albeit in rare circumstances). Gershwin Rep. at 2. He further opined that an individual's genetic makeup as well as additional environmental factors

can also play a role in GBS's development. Tr. at 15; Gershwin Rep. at 2; P. Brodin, et al., *Variation in the Human Immune System is Largely Driven by Non-Heritable Influences*, 160 Cell 37, 43 (2015), filed as Ex. 106 (ECF No. 39-1).

With regard to the proposed scientific mechanism at play in the present matter, Dr. Gershwin first discussed the role of cytokines in an immune response. Dr. Gershwin described cytokines as "soluble factors that allow cells to communicate." Tr. at 10. Cytokines act as both the initiator in an immune response and as a "molecular adjuvant[]" by strengthening the body's response to vaccine (or other foreign invader). Gershwin Rep. at 8. The immune system reaction to a vaccine, Dr. Gershwin explained, involves first responders (the innate response) and secondary responders (the adaptive immune response), which interact with each other like "two cog wheels in a clock." Tr. at 10. This interaction can lead to immune system dysregulation (or an overproduction in proinflammatory cytokines),[7] resulting in some form of inflammation (though, according to Dr. Gershwin the inflammation is not necessarily robust). *Id.* at 10, 37. He also opined that cytokine upregulation is not typically chronic in nature, but nonetheless could remain active for up to three weeks following vaccination (depending on the type and number of vaccines received). *Id.* at 60-61. In his formulation, vaccines "[are] the oxygen . . . that stimulate[] or produce[] cytokine production" and lead to an amplification or increase in antibody frequency. Tr. at 37.

According to Dr. Gershwin, the biologic process of molecular mimicry likely triggered the cytokine production relevant to Mr. Reichert's alleged development of vaccine-induced GBS. Tr. at 11-12. His testimony on this point revolved around a concept that has been largely accepted in the medical community (and in the Vaccine Program as well): that antibodies produced to fight off a foreign infection (or generated in response to a vaccine) can also mistakenly attack, or cross-react with, myelin basic protein ("MBP"), a primary protein component of human nerves. Given

[7] Dr. Gershwin referenced four articles in support of his cytokine upregulation theory. *See* J. Chabalgoity, et al., *The Relevance of Cytokines for Development of Protective Immunity and Rational Design of Vaccines*, 18 Cytokine & Growth Factor Revs. 195, 196-97 (2007), filed as Ex. 102 (ECF No. 26-2) ("Chabalgoity") (reviewing the role of cytokines in the development of effector and memory T cell responses as well as their potential use as a molecular adjuvant for vaccines against infectious diseases and cancers); T. Wang, et al., *The Cytokine Networks of Adaptive Immunity in Fish*, 35 Fish & Shell Immunol. 1703 (2013), filed as Ex. 103 (ECF No. 26-3) (discussing the cytokine network of adaptive immunity in fish and concluding that anticipating cytokine repertoires could be helpful in fish vaccine evaluation in the future); H. Yamane, et al., *Early Signaling Events that Underlie Fate Decisions of Naïve CD4+ T Cells Towards Distinct T-helper Cell Subsets*, 252 Immunol. Rev. 12 (2013), filed as Ex. 104 (ECF No. 26-4) (discussing how TCR-mediated signals in combination with the cytokine environment influence CD4 T cells at early stages of activation and regulate the differentiation of Th phenotypes); J. Zhu, et al., *Differentiation of Effector CD4 T Cell Populations*, 28 Annu. Rev. Immunol. 445 (2010), filed as Ex. 105 (ECF No. 26-5) (summarizing the discovery function and relationships among Th cells, the cytokine signaling requirements for their development, the networks of transcription factors involved, and their regulation). Chabalgoity generally supports Dr. Gershwin's assertion that cytokine deregulation is observed in the onset and maintenance of several pathological, non-infections conditions (including autoimmune diseases, neurodegenerative diseases, and cancers), although it does not discuss the role vaccines would play in encouraging cytokines within a pathogenic process. The remaining articles similarly discuss the relationship between T cells and cytokines in the context of immunologic memory, but make no mention of vaccinations as a potential pathogenic mechanism.

the nature of Mr. Reichert's injury (and the general acceptance in the Vaccine Program that the flu vaccine has plausibly been associated with GBS), Dr. Gershwin did not further discuss the science behind the process. His expert report similarly mentioned the general causation theory only in passing. *See* Gershwin Rep. at 8.

Dr. Gershwin's report also briefly referenced the concept of bystander activation as a possible secondary mechanism that could facilitate an immune response resulting in GBS. Gershwin Rep. at 8. In the case of bystander activation, Dr. Gershwin proposed, components of the flu vaccine might precipitate or exacerbate an autoimmune reaction from immune cells *not* specifically responding directly to the vaccine's antigens (as in the case with molecular mimicry), thereby producing cell damage via dysregulation. Tr. at 54; Gershwin Rep. at 8. His report, however, cited no literature in support of any role played by bystander activation in directly causing GBS, and he offered no further discussion on the topic. At hearing, Dr. Gershwin clarified that he relies on the concept "only to the extent that inflammatory cytokines are produced" initially. Tr. at 53. And in any event, in his view, bystander activation could only occur secondarily to some type of direct inciting factor (such as an infection or vaccination). *Id.* at 54.

Dr. Gershwin next explained how (in his view), the flu vaccine could have triggered Petitioner's GBS over seventy-two days after its receipt. In his expert report, Dr. Gershwin accepted as true Mr. Reichert's testimony that he was likely exposed to an infection (or "initiating feature") post-vaccination, which in turn encouraged the production of GBS-related autoantibodies, resulting in subclinical symptoms (due to their low frequency presentation). Tr. 16-18, 20. This intervening infection thus caused a loss of immunologic tolerance, but not necessarily clinically-observable symptoms. *Id.* at 17. Petitioner's pre-existing UTI could also constitute such an infection. *Id.*; *see* Ex. 3 at 33.

According to Dr. Gershwin, the infection (along with the production of subclinical GBS antibodies) was in effect the "flame" or "initiating feature" responsible for Mr. Reichert's GBS symptoms – with the flu vaccine serving as a catalyst, or "oxygen to the flame." Gershwin Rep. at 8; Tr. at 18. According to Dr. Gershwin, cytokines communicate and travel around the body and facilitate the maturation of a loss of tolerance beginning immediately (in response to the pre-existing infection). Tr. at 17; Gershwin Rep. at 7. The antibodies produced in response expand as they react to the cytokines and attack the nerve cells, resulting in adverse neurological symptoms consistent with GBS. Tr. at 19, 39. Dr. Gershwin asserted that a sufficient amount of presenting autoantibodies is required to produce cell damage (though he could not say how much). Tr. at 38, 39-40. This reaction continues based on the immune response and contributing environmental factors, without any more involvement from the vaccine (once initiated after the vaccine's initial administration). *Id.* Dr. Gershwin directly acknowledged that his theory of vaccine causation relied on an infection serving as the process's "initiating feature." *Id.* at 20.

Accounting for the seventy-two day delay in symptomology more specifically, Dr. Gershwin explained that every individual autoimmune disease involves antibody buildup that

precedes clinical symptomology. Tr. at 45. Autoantibodies can appear long before the onset of disease, or they can appear despite never amounting to a clinical disease. Tr. at 16. In the present case, Dr. Gershwin supported the seventy-two day onset period by relying on evidence of a long latency common to different autoimmune diseases including lupus, rheumatoid arthritis ("RA"), type I diabetes, limbic encephalitis, and primary biliary cholangitis. *See, e.g.*, M. Arbuckle, et al., *Development of Autoantibodies Before the Clinical Onset of Systematic Lupus Erythematosus*, 349 N. Eng. J. Med. 1526, 1532 (2003), filed as Ex. 97 (ECF No. 25-6) ("Arbuckle"); A. Mattalia, et al., *Characterization of Antimitochondrial Antibodies in Healthy Adults*, 27 Hepatology 656, 659-60 (1998), files as Ex. 98 (ECF No. 25-7); R. Towns, et al., *GAD65 Autoantibodies and Its Role as a Biomarker of Type 1 Diabetes and Latent Autoimmune Diabetes in Adults (LADA)*, 36 Future Drugs 847, 848 (2011), filed as Ex. 99 (ECF No. 25-8); H. Kokkonen, et al., *Associations of Antibodies Against Citrullinated Peptides with Human Leukocyte Antigen-Shared Epitope and Smoking Prior to the Development of Rheumatoid Arthritis*, 17 Arthritis Res. Ther. 125, 126 (2015), filed as Ex. 90 (ECF No. 25-9) ("Kokkonen"); S. Fauser, et al., *Long Latency between GAD-Antibody Detection and Development of Limbic Encephalitis—A Case Report*, 15 BMC Neuro. 177, 180 (2015), filed as Ex. 101 (ECF No. 29-1). Such diseases can exist in a subclinical state for months or years prior to clinical manifestation of the disease. Gershwin Rep. at 7-8; Tr. at 46. None of the literature offered, however, discussed a long latency period with regard to onset of GBS (which is known to present acutely).

Additionally, Dr. Gershwin found support for a seventy-two day onset based upon the overall course of Mr. Reichert's disease presentation. According to Dr. Gershwin, Mr. Reichert's mild GBS presentation supported his assertion that Mr. Reichert likely experienced some form of subclinical GBS that could take longer to present (due to the buildup of antibodies that would precede clinical symptoms). Tr. at 61. However, he cited no literature associating the severity of GBS with predicted onset after immunologic insult.

Dr. Gershwin did not find it concerning that Mr. Reichert's medical course showed no evidence of acute inflammation before clinical onset in January 2015. He opined that robust inflammation (i.e. localized swelling, for example) is independent of cytokine-induced inflammation—and thus, not necessary to evidence the existence of a more damaging process. Tr. at 41. However, he did opine that inflammatory cytokines *must* be present in order for his theory to work. *Id.* For example, Dr. Gershwin offered the example of lupus – an autoinflammatory rheumatologic condition[8], which he asserted could present with a massive increase in inflammatory cytokines without underlying clinical inflammation. Tr. at 41. Dr. Gershwin stressed the importance of categorizing types of inflammation in order to account for the lack of any indication of inflammation in Petitioner's medical records. *Id.* at 42.

[8] Systemic lupus erythematosus is a chronic, inflammatory, often febrile multisystem disorder of the connective tissue that proceeds through remissions and relapses. It may be either acute or insidious in onset and is characterized principally by involvement of the skin, joints, kidneys, and serosal membranes. It can be marked by a wide variety of abnormalities, including central nervous system manifestations. *Dorland's* at 1080.

At hearing, Dr. Gershwin offered a second theory as a possible alternative explanation for Mr. Reichert's delayed manifestation of GBS symptoms: "original antigenic sin." Tr. at 22, 60. He characterized it as similar to the challenge-rechallenge concept often offered by experts in Vaccine Program cases. Tr. at 53. Under this theory, a patient is exposed to virus A, and then months later is exposed to virus B, similar to the first. Tr. at 48. The patient then experiences a robust response to virus A (with no clinical response to virus B). *Id.* at 29, 48. Upon second exposure to the same pathogen, the immune response occurs in a similar fashion, but at a much faster rate due to a cell's ability to recognize the antigen invader more quickly.

Dr. Gershwin referenced only one piece of literature in support of his "antigenic sin" theory. *See* A. Vatti, et al., *Original Antigenic Sin: A Comprehensive Review*, 83 J. Autoimmun. 12 (2017), filed as Ex. 109 (ECF No. 48-1) ("Vatti"). Vatti (co-authored by Dr. Gershwin) purports to offer evidence that viral exposure (via a vaccination) coupled with an immune response to a second viral infection can result in an antibody-dependent enhancement in response to the original infectious antigen. *Id.* at 12. In the context of the flu vaccine specifically, however, the article discusses the role of antigenic sin only with regard to the 2009 swine flu pandemic, and only briefly suggests that researchers offered the theory as a possible explanation for the sub-optimal response to the H1N1 strain circulating at that time. *Id.* at 17. The article does discuss some evidence of cross-reactive immune responses to certain diseases (including the dengue or zika viruses), but otherwise does not support Petitioner's contention that the flu vaccine (coupled with Petitioner's alleged secondary exposure to the wild flu virus) could cause an individual to develop GBS.

Consistent with the above theory, Dr. Gershwin theorized that Mr. Reichert received the flu vaccine in October 2014, and his body responded by producing an appropriate immune response. *Id.* Then, according to Dr. Gershwin, Mr. Reichert was likely exposed to the influenza wild virus through contact with his wife (a nurse) which, hypothetically, led him to experience a full clinical response to the original flu shot immunogen. Tr. at 21. Despite these assertions, however, Dr. Gershwin could not cite to any medical record supporting the contention that Mr. Reichert suffered from any clinical manifestation of a flu wild virus exposure or reaction following vaccination. He nevertheless opined that Mr. Reichert "had [at best] an infestation *if* he was exposed." Tr. at 49 (emphasis added). On cross examination, Dr. Gershwin admitted he relied solely on Mr. Reichert's affidavit in support of any assertion that he was exposed to the wild virus (or suffered any symptoms consistent with the same). Tr. at 29.

Dr. Gershwin acknowledged at hearing that the typically-accepted, medically acceptable timeframe for a flu vaccine-induced GBS injury is "six weeks or less[,]" but opined that outlying cases (with a lengthier onset of symptoms) could still exist. Tr. at 16, 56. More significantly, he admitted that a four-month GBS onset after vaccination was likely *not* medically acceptable given the pathogenic nature of anti-GBS antibodies (consistent with the disease's acute character). *Id.* at 47, 58. However, he characterized Petitioner's case as an outlier, given the relevant environmental factors at play (such as the pre-existing UTI infection or possible post-vaccination exposure to the

wild flu virus). *Id.* at 56-57. This, plus the lack of any other identifiable explanation, persuaded him that Mr. Reichert's injury was more likely than not vaccine-induced. *Id.* at 57.

B. *Respondent's Expert – Dr. Noel Rose*

Respondent presented his own expert in immunology, Dr. Noel Rose, who authored one report and testified at hearing. *See* Expert Report, dated April 12, 2017, filed as Ex. D (ECF No. 33-1) ("Rose Rep."); Tr. at 61- 124. Dr. Rose opined that the flu vaccine did not contribute to Mr. Reichert's GBS directly or as a contributing component. *Id.* at 71; Rose Rep. at 6.

Dr. Rose is board certified in pathology, medical microbiology, and laboratory immunology. Tr. at 59-60. He received his Ph.D. at the University of Pennsylvania and his medical degree from State University of New York after attending Yale University for his undergraduate education. *See* Curriculum Vitae of Dr. Rose, dated May 1, 2014, filed as Ex. E (ECF 33-2) ("Rose CV"); Tr. at 62. Currently, Dr. Rose serves part-time on the faculty of Department of Pathology at Brigham & Women's Hospital, and as senior lecturer at Harvard Medical School. Tr. at 64. He was previously chair of the department of immunology and infectious diseases at Johns Hopkins University, and director of the World Health Organization Collaborating Center for Autoimmune Disorders. Rose CV at 1; Tr. 63. Dr. Rose has authored over 500 publications in scientific journals and books devoted to autoimmune diseases. Rose CV at 5; Tr. at 66.

Similar to Dr. Gershwin, Dr. Rose began by offering a brief description of GBS and its clinical characteristics. He described GBS as an inflammatory disease involving injury to the peripheral nerves. Tr. at 72. GBS is likely produced by autoantibodies directed to gangliosides or the ganglionic acetylcholine receptors found in the peripheral nerve (although in his view antibody evidence generally can be somewhat unpersuasive in determining an exact cause of a disease, given how common they can be even in the absence of a disease). Rose Rep. at 5; Tr. at 87-88. He therefore agreed that GBS is attributable to an autoimmune process, but maintained that its direct cause or trigger is unclear from a clinical standpoint. Tr. at 73. Dr. Rose also stressed that GBS is considered an acute disease - a patient may be well in the evening and then display symptoms of sensory impact the very next morning. *Id.* He further allowed that environmental factors (such as an infection) can be associated with an occurrence of GBS. *Id.* at 74.

Dr. Rose next discussed the role cytokines can play in the pathogenesis of an autoimmune disease. According to Dr. Rose, cytokines are protein molecules that cells use to communicate with neighboring cells. Tr. at 74. Dr. Rose agreed with Dr. Gershwin's assertion that cytokine production is triggered by some action on the cell (i.e., an infectious agent or vaccine), and can in some circumstances result in a damaging injury of some kind (to which the cell responds). Tr. at 75. He disagreed, however, with Dr. Gershwin's comments concerning the clinical symptoms associated with such production. Cytokine production, Dr. Rose opined, is most commonly accompanied by outward symptoms of inflammation - pain, heat, and redness (generated for the purpose of eliminating the infectious intruder from the body). *Id.* at 76, 84; *see* L. Christian, et al.,

Proinflammatory Cytokine Reponses Correspond with Subjective Side Effects after Influenza Virus Vaccination, 33 Vaccine 3360, 3360-61 (2015), filed as Ex. T (ECF No. 34-7). Here, however, the medical record was devoid of evidence that Petitioner ever experienced any "out-of-control" inflammatory response in the months after vaccination. Rose Rep. at 5.

Based upon the above, Dr. Rose addressed Dr. Gershwin's reliance on Petitioner's purported increased levels of autoantibodies as establishing the existence of a subclinical GBS reaction to the vaccine. He instead suggested that the presence of autoantibodies in the body generally is not persuasive evidence of any type of causal effect. Tr. at 88. He agreed that certain diseases, like lupus, are associated with a pre-onset increase in associated autoantibodies, and that this increase may long pre-date clinical signs of the disease. Rose Rep. at 6. In support, Dr. Rose referenced a study in which patients with lupus presented with an increase of key cytokine mediators (such as IL5, IL6, and TNF gamma). *Id.*; *see* R. Lu, et al., *Dysregulation of Innate and Adaptive Serum Mediators Precedes Systemic Lupus Erythematosus Classification and Improves Prognostic Accuracy of Autoantibodies*, filed as Ex. S (ECF 34-6). But Dr. Rose distinguished lupus from GBS in terms of their presentations, with GBS known to be acute. Rose Rep. at 5; Tr. at 85-88. Overall, Dr. Rose asserted that Mr. Reichert's progression to clinical disease could not be credibly compared to long-onset diseases like lupus given the long latency period that occurred between vaccination and his initial, acute GBS symptoms. *Id*. And in any event, Dr. Rose could find no evidence in the record indicating that Mr. Reichert's antibody levels were even tested, making assertions about what those levels might have been speculative. Rose Rep. at 6.

In the context of the present case, Dr. Rose took direct issue with the capacity of the flu vaccine to cause a GBS injury seventy-two days post-vaccination. In so opining, he relied heavily on the state of the medical literature, which is in agreement that GBS post-vaccination should present acutely (becoming significantly worse four days after administration), with a maximum temporal onset after vaccination of six to eight weeks. Tr. at 86, 88, 95; *see* L. Schonberger, et al., *Guillain-Barre Syndrome Following Vaccination in the National Influenza Immunization Program, United States, 1976-1977*, 110 Am. J. Epidemiology 105, 120 (1979), filed as Ex. W (ECF No. 34-10); A. Ramakrishnan, et al., *Differential Serum Cytokine Responses to Inactivated and Live Attenuated Seasonal Influenza Vaccines*, 60 Cytokine 661, 665 (2012), filed as Ex. V (ECF No. 34-9).

Dr. Rose also attacked Dr. Gershwin's "oxygen (flu vaccine) to flame (pre-existing UTI)" causation theory, describing it as a "sinking ship." Tr. at 81. Dr. Rose instead proposed that Dr. Gershwin's theory - that a pre-vaccination infection could induce a long subclinical immune response later enhanced by the vaccine (via an upregulation in cytokines) - would not result in the type of reaction Mr. Reichert actually experienced. Tr. at 81-82. Rather, for Dr. Gershwin's theory to be viable, inflammation would have to already be present at the time of vaccination (or close in time thereafter), and also that the cytokine response would be "very proximate" to vaccination administration. *Id.* at 83. GBS, however, is associated with a known level of outward, clinical manifestations of inflammation (i.e. fever, chills, muscle aches, rash, and localized swelling). *Id.*

at 84-85. Dr. Rose did not dispute that Mr. Reichert experienced such symptoms in January 2015, but asserted that a process resulting in them months later was simply implausible. *Id.*; see Rose Rep. at 2.

Finally, Dr. Rose dismissed Dr. Gershwin's "antigenic sin" theory, which he termed a "lifeboat theory." Tr. at 91. According to Dr. Rose, the purported role of an intervening wild-type influenza virus that this theory posited only strengthened the conclusion that the earlier vaccination had nothing to do with Petitioner's disease course – especially given the more robust pathogenic nature of a wild virus infection. *Id.* Moreover, this newly-asserted theory required proof of an actual infection, with attendant manifesting clinical symptoms. *Id.* at 99-100, 101. But Mr. Reichert submitted no medical record evidence showing he ever experienced clinical symptoms of the flu post-vaccination (assuming he was in fact exposed to a wild virus infection after vaccination as alleged), and his statements that this had occurred were therefore uncorroborated. Tr. at 124.

III. Procedural History

Mr. Reichert filed his Petition on June 14, 2016. Pet. at 1. The Statement of Completion was then filed on August 2, 2016. ECF No. 9. Almost four months later, on October 3, 2016, Respondent filed his Rule 4(c) report contesting Mr. Reichert's entitlement to compensation. ECF No. 11. The case thereafter proceeded in a timely manner.

Roughly two months later, the parties began filing expert reports. Petitioner filed an initial expert report from Dr. Gershwin on December 6, 2016. ECF No. 15. Respondent filed his responsive report from Dr. Rose on April 24, 2017. ECF No. 33. Thereafter, I held a status conference in early May 2017 and scheduled a hearing for April 6, 2018, to determine entitlement. ECF No. 36. The hearing was held as scheduled and included testimony from the experts identified above. Petitioner offered no fact witnesses in support of his claim. The parties did not submit post-hearing briefs. The matter is ripe for adjudication.

IV. Applicable Legal Standards

A. *Petitioner's Overall Burden in Vaccine Program Cases*

To receive compensation in the Vaccine Program, a petitioner must prove either: (1) that he suffered a "Table Injury" – *i.e.*, an injury falling within the Vaccine Injury Table – corresponding to one of the vaccinations in question within a statutorily prescribed period of time or, in the alternative, (2) that his illnesses were actually caused by a vaccine (a "Non-Table Injury"). *See* Sections 13(a)(1)(A), 11(c)(1), and 14(a), as amended by 42 C.F.R. § 100.3; § 11(c)(1)(C)(ii)(I); *see also Moberly v. Sec'y of Health & Human Servs.*, 592 F.3d 1315, 1321 (Fed.

Cir. 2010); *Capizzano v. Sec'y of Health & Human Servs.*, 440 F.3d 1317, 1320 (Fed. Cir. 2006).[9] In this case, Petitioner does not assert a Table claim.

For both Table and Non-Table claims, Vaccine Program petitioners bear a "preponderance of the evidence" burden of proof. Section 13(1)(a). That is, a petitioner must offer evidence that leads the "trier of fact to believe that the existence of a fact is more probable than its nonexistence before [he] may find in favor of the party who has the burden to persuade the judge of the fact's existence." *Moberly*, 592 F.3d at 1322 n.2; *see also Snowbank Enter. v. United States*, 6 Cl. Ct. 476, 486 (1984) (mere conjecture or speculation is insufficient under a preponderance standard). Proof of medical certainty is not required. *Bunting v. Sec'y of Health & Human Servs.*, 931 F.2d 867, 873 (Fed. Cir. 1991). In particular, a petitioner must demonstrate that the vaccine was "not only [the] but-for cause of the injury but also a substantial factor in bringing about the injury." *Moberly*, 592 F.3d at 1321 (quoting *Shyface v. Sec'y of Health & Human Servs.*, 165 F.3d 1344, 1352-53 (Fed. Cir. 1999)); *Pafford v. Sec'y of Health & Human Servs*., 451 F.3d 1352, 1355 (Fed. Cir. 2006). A petitioner may not receive a Vaccine Program award based solely on his assertions; rather, the petition must be supported by either medical records or by the opinion of a competent physician. Section 13(a)(1).

In attempting to establish entitlement to a Vaccine Program award of compensation for a Non-Table claim, a petitioner must satisfy all three of the elements established by the Federal Circuit in *Althen*: "(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 proximate temporal relationship between vaccination and injury." *Althen*, 418 F.3d at 1278.

Each of the *Althen* prongs requires a different showing. Under *Althen* prong one, petitioners must provide a "reputable medical theory," demonstrating that the vaccine received *can cause* the type of injury alleged. *Pafford*, 451 F.3d at 1355-56 (citations omitted). To satisfy this prong, a petitioner's theory must be based on a "sound and reliable medical or scientific explanation." *Knudsen v. Sec'y of Health & Human Servs.*, 35 F.3d 543, 548 (Fed. Cir. 1994). Such a theory must only be "legally probable, not medically or scientifically certain." *Id.* at 549.

Petitioners may satisfy the first *Althen* prong without resort to medical literature, epidemiological studies, demonstration of a specific mechanism, or a generally accepted medical theory. *Andreu v. Sec'y of Health & Human Servs.*, 569 F.3d 1367, 1378-79 (Fed. Cir. 2009) (citing *Capizzano*, 440 F.3d at 1325-26). Special masters, despite their expertise, are not empowered by

[9] Decisions of special masters (some of which I reference in this ruling) constitute persuasive but not binding authority. *Hanlon v. Sec'y of Health & Human Servs.*, 40 Fed. Cl. 625, 630 (1998). By contrast, Federal Circuit rulings concerning legal issues are binding on special masters. *Guillory v. Sec'y of Health & Human Servs.*, 59 Fed. Cl. 121, 124 (2003), *aff'd* 104 F. App'x 712 (Fed. Cir. 2004); *see also Spooner v. Sec'y of Health & Human Servs.*, No. 13-159V, 2014 WL 504728, at *7 n.12 (Fed. Cl. Spec. Mstr. Jan. 16, 2014).

statute to conclusively resolve what are essentially thorny scientific and medical questions, and thus scientific evidence offered to establish *Althen* prong one is viewed "not through the lens of the laboratorian, but instead from the vantage point of the Vaccine Act's preponderant evidence standard." *Id.* at 1380. Accordingly, special masters must take care not to increase the burden placed on petitioners in offering a scientific theory linking vaccine to injury. *Contreras v. Sec'y of Health & Human Servs.*, 121 Fed. Cl. 230, 245 (2015).

In discussing the evidentiary standard applicable to the first *Althen* prong, many decisions of the Court of Federal Claims and Federal Circuit have emphasized that petitioners need only establish a causation theory's biologic plausibility (and thus need not do so with preponderant proof). *Tarsell v. United States,* 133 Fed. Cl. 782, 792-93 (2017) (special master committed legal error by requiring petitioner to establish first Althen prong by preponderance; that standard applied only to second prong and petitioner's overall burden); *Contreras*, 121 Fed. Cl. at 245 ("[p]lausibility . . . in many cases *may* be enough to satisfy *Althen* prong one" (emphasis in original)), *vacated on other grounds*, 844 F.3d 1363 (Fed. Cir. 2017); *see also Andreu*, 569 F.3d at 1375. At the same time, there is contrary authority from the Federal Circuit suggesting that the same preponderance standard used overall in evaluating a claimant's success in a Vaccine Act claim is also applied specifically to the first *Althen* prong. *See*, e.g., *Broekelschen v. Sec'y of Health & Human Servs.*, 618 F.3d 1339, 1350 (Fed. Cir. 2010) (affirming special master's determination that expert "had not provided a "reliable medical or scientific explanation" *sufficient to prove by a preponderance of the evidence a medical theory* linking the [relevant vaccine to relevant injury]") (emphasis added). Regardless, one thing remains: petitioners always have the ultimate burden of establishing their Vaccine Act claim *overall* with preponderant evidence. *W.C. v. Sec'y of Health & Human Servs.*, 704 F.3d 1352, 1356 (Fed. Cir. 2013) (citations omitted); *Tarsell,* 133 Fed. Cl. at 793 (noting that *Moberly* "addresses the petitioner's overall burden of proving causation-in-fact under the Vaccine Act" by a preponderance).

The second *Althen* prong requires proof of a logical sequence of cause and effect, usually supported by facts derived from a petitioner's medical records. *Althen*, 418 F.3d at 1278; *Andreu*, 569 F.3d at 1375-77; *Capizzano*, 440 F.3d at 1326; *Grant v. Sec'y of Health & Human Servs.*, 956 F.2d 1144, 1148 (Fed. Cir. 1992). In establishing that a vaccine "did cause" injury, the opinions and views of the injured party's treating physicians are entitled to some weight. *Andreu*, 569 F.3d at 1367; *Capizzano*, 440 F.3d at 1326 ("medical records and medical opinion testimony are favored in vaccine cases, as treating physicians are likely to be in the best position to determine whether a 'logical sequence of cause and effect show[s] that the vaccination was the reason for the injury'") (quoting *Althen*, 418 F.3d at 1280). Medical records are generally viewed as particularly trustworthy evidence, since they are created contemporaneously with the treatment of the patient. *Cucuras v. Sec'y of Health & Human Servs.*, 993 F.2d 1525, 1528 (Fed. Cir. 1993).

However, medical records and/or statements of a treating physician's views do not *per se* bind the special master to adopt the conclusions of such an individual, even if they must be considered and carefully evaluated. Section 13(b)(1) (providing that "[a]ny such diagnosis, conclusion, judgment, test result, report, or summary shall not be binding on the special master or court"); *Snyder v. Sec'y of Health & Human Servs*., 88 Fed. Cl. 706, 746 n.67 (2009) ("there is nothing . . . that mandates that the testimony of a treating physician is sacrosanct – that it must be accepted in its entirety and cannot be rebutted"). As with expert testimony offered to establish a theory of causation, the opinions or diagnoses of treating physicians are only as trustworthy as the reasonableness of their suppositions or bases. The views of treating physicians should also be weighed against other, contrary evidence also present in the record – including conflicting opinions among such individuals. *Hibbard v. Sec'y of Health & Human Servs.*, 100 Fed. Cl. 742, 749 (2011) (not arbitrary or capricious for special master to weigh competing treating physicians' conclusions against each other), *aff'd*, 698 F.3d 1355 (Fed. Cir. 2012); *Caves v. Sec'y of Dept. of Health & Human Servs.*, No. 06-522V, 2011 WL 1935813, at *17 (Fed. Cl. Spec. Mstr. Apr. 29, 2011), *mot. for review den'd*, 100 Fed. Cl. 344, 356 (2011), *aff'd without opinion*, 475 Fed. App'x 765 (Fed. Cir. 2012).

The third *Althen* prong requires establishing a "proximate temporal relationship" between the vaccination and the injury alleged. *Althen*, 418 F.3d at 1281. That term has been equated to the phrase "medically-acceptable temporal relationship." *Id.* A petitioner must offer "preponderant proof that the onset of symptoms occurred within a timeframe which, given the medical understanding of the disorder's etiology, it is medically acceptable to infer causation." *de Bazan v. Sec'y of Health & Human Servs.*, 539 F.3d 1347, 1352 (Fed. Cir. 2008). The explanation for what is a medically acceptable timeframe must also coincide with the theory of how the relevant vaccine can cause an injury (*Althen* prong one's requirement). *Id.* at 1352; *Shapiro v. Sec'y of Health & Human Servs.*, 101 Fed. Cl. 532, 542 (2011), *recons. den'd after remand*, 105 Fed. Cl. 353 (2012), *aff'd mem.*, 2013 WL 1896173 (Fed. Cir. 2013); *Koehn v. Sec'y of Health & Human Servs.*, No. 11-355V, 2013 WL 3214877 (Fed. Cl. Spec. Mstr. May 30, 2013), *mot. for review den'd* (Fed. Cl. Dec. 3, 2013), *aff'd*, 773 F.3d 1239 (Fed. Cir. 2014).

B. *Law Governing Analysis of Fact Evidence*

The process for making determinations in Vaccine Program cases regarding factual issues begins with consideration of the medical records. Section 11(c)(2). The special master is required to consider "all [] relevant medical and scientific evidence contained in the record," including "any diagnosis, conclusion, medical judgment, or autopsy or coroner's report which is contained in the record regarding the nature, causation, and aggravation of the petitioner's illness, disability, injury, condition, or death," as well as the "results of any diagnostic or evaluative test which are contained in the record and the summaries and conclusions." Section 13(b)(1)(A). The special master is then required to weigh the evidence presented, including contemporaneous medical records and

testimony. *See Burns v. Sec'y of Health & Human Servs*., 3 F.3d 415, 417 (Fed. Cir. 1993) (it is within the special master's discretion to determine whether to afford greater weight to contemporaneous medical records than to other evidence, such as oral testimony surrounding the events in question that was given at a later date, provided that such determination is evidenced by a rational determination).

Medical records that are created contemporaneously with the events they describe are presumed to be accurate and "complete" (i.e., presenting all relevant information on a patient's health problems). *Cucuras*, 993 F.2d at 1528; *Doe/70 v. Sec'y of Health & Human Servs.*, 95 Fed. Cl. 598, 608 (2010) ("[g]iven the inconsistencies between petitioner's testimony and his contemporaneous medical records, the special master's decision to rely on petitioner's medical records was rational and consistent with applicable law"), *aff'd*, *Rickett v. Sec'y of Health & Human Servs*., 468 F. App'x 952 (Fed. Cir. 2011) (non-precedential opinion). This presumption is based on the linked propositions that (i) sick people visit medical professionals; (ii) sick people honestly report their health problems to those professionals; and (iii) medical professionals record what they are told or observe when examining their patients in as accurate a manner as possible, so that they are aware of enough relevant facts to make appropriate treatment decisions. *Sanchez v. Sec'y of Health & Human Servs.*, No. 11-685V, 2013 WL 1880825, at *2 (Fed. Cl. Spec. Mstr. Apr. 10, 2013); *Cucuras v. Sec'y of Health & Human Servs.*, 26 Cl. Ct. 537, 543 (1992), *aff'd*, 993 F.2d at 1525 (Fed. Cir. 1993) ("[i]t strains reason to conclude that petitioners would fail to accurately report the onset of their daughter's symptoms").

Accordingly, if the medical records are clear, consistent, and complete, then they should be afforded substantial weight. *Lowrie v. Sec'y of Health & Human Servs*., No. 03-1585V, 2005 WL 6117475, at *20 (Fed. Cl. Spec. Mstr. Dec. 12, 2005). Indeed, contemporaneous medical records are generally found to be deserving of greater evidentiary weight than oral testimony – especially where such testimony conflicts with the record evidence. *Cucuras*, 993 F.2d at 1528; *see also Murphy v. Sec'y of Health & Human Servs*., 23 Cl. Ct. 726, 733 (1991), *aff'd per curiam*, 968 F.2d 1226 (Fed. Cir. 1992), *cert. den'd*, *Murphy v. Sullivan*, 506 U.S. 974 (1992) (citing *United States v. United States Gypsum Co.*, 333 U.S. 364, 396 (1947) ("[i]t has generally been held that oral testimony which is in conflict with contemporaneous documents is entitled to little evidentiary weight.")).

However, there are situations in which compelling oral testimony may be more persuasive than written records, such as where records are deemed to be incomplete or inaccurate. *Campbell v. Sec'y of Health & Human Servs*., 69 Fed. Cl. 775, 779 (2006) ("like any norm based upon common sense and experience, this rule should not be treated as an absolute and must yield where the factual predicates for its application are weak or lacking"); *Lowrie*, 2005 WL 6117475, at *19 ("[w]ritten records which are, themselves, inconsistent, should be accorded less deference than those which are internally consistent") (quoting *Murphy*, 23 Cl. Ct. at 733)). Ultimately, a

determination regarding a witness's credibility is needed when determining the weight that such testimony should be afforded. *Andreu*, 569 F.3d at 1379; *Bradley v. Sec'y of Health & Human Servs*., 991 F.2d 1570, 1575 (Fed. Cir. 1993).

When witness testimony is offered to overcome the presumption of accuracy afforded to contemporaneous medical records, such testimony must be "consistent, clear, cogent, and compelling." *Sanchez*, 2013 WL 1880825, at *3 (citing *Blutstein v. Sec'y of Health & Human Servs*., No. 90-2808V, 1998 WL 408611, at *5 (Fed. Cl. Spec. Mstr. June 30, 1998)). In determining the accuracy and completeness of medical records, the Court of Federal Claims has listed four possible explanations for inconsistencies between contemporaneously created medical records and later testimony: (1) a person's failure to recount to the medical professional everything that happened during the relevant time period; (2) the medical professional's failure to document everything reported to her or him; (3) a person's faulty recollection of the events when presenting testimony; or (4) a person's purposeful recounting of symptoms that did not exist. *La Londe v. Sec'y of Health & Human Servs*., 110 Fed. Cl. 184, 203-04 (2013), *aff'd*, 746 F.3d 1334 (Fed. Cir. 2014). In making a determination regarding whether to afford greater weight to contemporaneous medical records or other evidence, such as testimony at hearing, there must be evidence that this decision was the result of a rational determination. *Burns*, 3 F.3d at 417.

C. *Analysis of Expert Testimony*

Establishing a sound and reliable medical theory often requires a petitioner to present expert testimony in support of his claim. *Lampe v. Sec'y of Health & Human Servs*., 219 F.3d 1357, 1361 (Fed. Cir. 2000). Vaccine Program expert testimony is usually evaluated according to the factors for analyzing scientific reliability set forth in *Daubert v. Merrell Dow Pharm., Inc.*, 509 U.S. 579, 594-96 (1993). *See Cedillo v. Sec'y of Health & Human Servs.*, 617 F.3d 1328, 1339 (Fed. Cir. 2010) (citing *Terran v. Sec'y of Health & Human Servs.*, 195 F.3d 1302, 1316 (Fed. Cir. 1999). "The *Daubert* factors for analyzing the reliability of testimony are: (1) whether a theory or technique can be (and has been) tested; (2) whether the theory or technique has been subjected to peer review and publication; (3) whether there is a known or potential rate of error and whether there are standards for controlling the error; and (4) whether the theory or technique enjoys general acceptance within a relevant scientific community." *Terran*, 195 F.3d at 1316 n.2 (citing *Daubert*, 509 U.S. at 592-95).

The *Daubert* factors play a slightly different role in Vaccine Program cases than they do when applied in other federal judicial for a (such as the district courts). *Daubert* factors are usually employed by judges (in the performance of their evidentiary gatekeeper roles) to exclude evidence that is unreliable and/or could confuse a jury. In Vaccine Program cases, by contrast, these factors are used in the *weighing* of the reliability of scientific evidence proffered. *Davis v. Sec'y of Health & Human Servs*., 94 Fed. Cl. 53, 66-67 (2010) ("uniquely in this Circuit, the *Daubert* factors have

been employed also as an acceptable evidentiary-gauging tool with respect to persuasiveness of expert testimony already admitted"). The flexible use of the *Daubert* factors to evaluate the persuasiveness and reliability of expert testimony has routinely been upheld. *See, e.g.*, *Snyder*, 88 Fed. Cl. at 742-45. In this matter (as in numerous other Vaccine Program cases), *Daubert* has not been employed at the threshold, to determine what evidence should be admitted, but instead to determine whether expert testimony offered is reliable and/or persuasive.

Respondent frequently offers one or more experts of his own in order to rebut a petitioner's case. Where both sides offer expert testimony, a special master's decision may be "based on the credibility of the experts and the relative persuasiveness of their competing theories." *Broekelschen v. Sec'y of Health & Human Servs*., 618 F.3d 1339, 1347 (Fed. Cir. 2010) (citing *Lampe*, 219 F.3d at 1362). However, nothing requires the acceptance of an expert's conclusion "connected to existing data only by the *ipse dixit* of the expert," especially if "there is simply too great an analytical gap between the data and the opinion proffered." *Snyder*, 88 Fed. Cl. at 743 (quoting *Gen. Elec. Co. v. Joiner*, 522 U.S. 146 91997)); *see also Isaac v. Sec'y of Health & Human Servs*., No. 08-601V, 2012 WL 3609993, at *17 (Fed. Cl. Spec. Mstr. July 30, 2012), *mot. for review den'd*, 108 Fed. Cl. 743 (2013), *aff'd*, 540 Fed. App'x 999 (Fed. Cir. 2013) (citing *Cedillo*, 617 F.3d at 1339). Weighing the relative persuasiveness of competing expert testimony, based on a particular expert's credibility, is part of the overall reliability analysis to which special masters must subject expert testimony in Vaccine Program cases. *Moberly*, 592 F.3d at 1325-26 ("[a]ssessments as to the reliability of expert testimony often turn on credibility determinations"); *see also Porter v. Sec'y of Health & Human Servs*., 663 F.3d 1242, 1250 (Fed. Cir. 2011) ("this court has unambiguously explained that special masters are expected to consider the credibility of expert witnesses in evaluating petitions for compensation under the Vaccine Act").

D. *Consideration of Medical Literature*

Both parties filed medical and scientific literature in this case, but not every filed item factors into the outcome of this decision. While I have reviewed all of the medical literature submitted in this case, I discuss only those articles that are most relevant to my determination and/or are central to Petitioner's case – just as I have not exhaustively discussed every individual medical record filed. *Moriarty v. Sec'y of Health & Human Servs.*, No. 2015-5072, 2016 WL 1358616, at *5 (Fed. Cir. Apr. 6, 2016) ("[w]e generally presume that a special master considered the relevant record evidence even though he does not explicitly reference such evidence in his decision") (citation omitted); *see also Paterek v. Sec'y of Health & Human Servs.,* 527 F. App'x 875, 884 (Fed. Cir. 2013) ("[f]inding certain information not relevant does not lead to – and likely undermines – the conclusion that it was not considered").

ANALYSIS

I. Overview of GBS

GBS is a peripheral neuropathy involving rapidly progressive ascending motor neuron paralysis of unknown etiology, although it is frequently seen after an enteric or respiratory infection. *See Dorland's Illustrated Medical Dictionary* 1832 (32nd ed. 2012). It is believed to have an autoimmune mechanism. *Id.* GBS begins with paresthesias in the feet and progresses to a flaccid paralysis of the lower limbs, ascending to the trunk, upper limbs, and face. *Id.* Other characteristics include low-grade fever, bulbar palsy, absent tendon reflexes, and increased protein levels in the cerebral spinal fluid without a corresponding increase in cells. *Id.* Variant forms include acute autonomic neuropathy, Miller-Fisher syndrome, acute motor axonal neuropathy, and acute motor-sensory axonal neuropathy. *Id.*

Claims alleging a link between the flu vaccine and GBS are common in the Vaccine Program - so much so that more often than not viable claims settle in the petitioner's favor. *See, e.g., Stitt v. Sec'y of Health & Human Servs.,* No. 09-653V, 2013 WL 3356791 (Fed. Cl. Spec. Mstr. May 31, 2013); *Stewart v. Sec'y of Health & Human Servs.*, No. 06–777V, 2011 WL 3241585, at *16 (Fed. Cl. Spec. Mstr. July 8, 2011); *see also Barone v. Sec'y of Health & Human Servs.*, No. 11-707V, 2014 WL 6834557 (Fed. Cl. Spec. Mstr. Nov. 12, 2014). Indeed, the Vaccine Table was amended recently to include claims that GBS was caused by the flu vaccine within a tightly-defined timeframe. *See* 42 C.F.R. § 100.3(a) (2017).[10]

However, in most successful non-Table cases, onset of symptoms is demonstrated to have occurred no longer than six to eight weeks after vaccination. *See, e.g., Barone*, 2014 WL 6834557, at *13 (eight weeks is the longest reasonable timeframe for a flu/GBS injury). I am aware of no published Vaccine Program Decisions that have found a timeframe longer than two months to be medically acceptable. *See, e.g., Aguayo v. Sec'y of Health & Human Servs.*, No. 12-563V, 2013 WL 441013, at *4 (Fed. Cl. Spec. Mstr. Jan. 15, 2013) (three and one-half month onset for flu/GBS injury deemed too attenuated to be causal); *Corder v. Sec'y of Health & Human Servs.*, No. 08-228V, 2011 WL 2469736, at *27-29 (Fed. Cl. Spec. Mstr. May 31, 2011) (proposed four month onset period from vaccination to GBS injury is too long; two months is the longest reasonable timeframe).

II. *Althen* Prongs Analysis

Because there is little dispute as to whether (for purposes of a Vaccine Program claim, which applies a legal rather than scientific standard) the flu vaccine "can cause" GBS, there is no need for an extensive discussion of the likely mechanism or the adequacy of the proof offered

[10] Petitioner could not assert a viable Table claim based on an onset of 72 days post-vaccination, since the Table flu-GBS claim requires onset to occur no more than 42 days after vaccine receipt. *See* 42 C.F.R. § 100.3(a)(XIV)(D).

herein on this point in a general sense. But it is also indisputable that Petitioner's first GBS symptoms occurred 72 days post-vaccination – and that this timeframe far exceeds what has ever before been found medically acceptable in the Program. Petitioner is therefore proceeding on the basis of a theory somewhat different than what is usually presented. As a result (and consistent with the fact that the third *Althen* prong involves some concurrent consideration of the plausibility of a claimant's causal theory under the first prong), I will review the adequacy of Petitioner's showing in a blended analysis of both prongs, rather than simply evaluate the third *Althen* prong by itself.

First, I find that Petitioner has not offered a plausible causation theory, based on reliable scientific evidence, supporting his contention that some combination of the flu vaccine and either pre-existing or intervening infection could cause GBS so long after vaccination to still render the vaccine a substantial factor in causing the disease. The articles offered do not directly, or even indirectly, support these contentions. Large aspects of this theory also fly in the face of what is known about GBS - that it is usually acute and monophasic, meaning that it is not heralded by a long, subclinical period in which autoantibodies build up, akin to a rheumatologic disease like lupus (which is distinguishable from GBS on many levels).[11] And although Dr. Gershwin is a qualified expert who frequently offers sound testimony in Program cases, here he has not demonstrated sufficient specific expertise in the study of GBS or the theory presented to ameliorate its otherwise lack of reliable objective scientific support. Rather, he seems to have attempted to pose a theory that fits the facts of this case – not one that is sufficiently, and independently reliable to meet the Program's otherwise-lenient evidentiary standards. *See Rolshoven v. Sec'y of Health & Human Servs.*, No. 14-439V, 2018 WL 1124737, at *28-30 (Fed. Cl. Spec. Mstr. Jan. 11, 2018).

Another unreliable element of Petitioner's theory is Dr. Gershwin's proposition that cytokine upregulation connected to the flu vaccine could have played a pathogenic role in producing or encouraging the demyelination caused by an autoimmune cross-reaction that is at the heart of GBS. I have noted in other cases that petitioners often try to leverage the accepted immunologic concept that vaccines promote proinflammatory cytokine upregulation into the conclusion that such an increase can also initiate or contribute to an autoimmune disease process – ignoring the fact that the cytokine upregulation is typically transient, and often isolated to the physical situs of vaccination as well. *See, e.g., Godfrey v. Sec'y of Health & Human Servs.*, No. 10-565V, 2015 WL 10710961, at *11-13 (Fed. Cl. Spec. Mstr. Oct. 27, 2015), *mot. for review*

[11] According to the literature filed by both parties, GBS is categorized as a disease associated with great amounts of acute inflammation and demyelination. *See,* e.g., Hughes at 92 ("GBS is usually produced by acute inflammatory demyelinating polyradiculoneuropathy" in Western populations); H. Willison, *The Immunobiology of Guillain-Barré Syndromes*, 10 J. Peripheral Nerv. Sys. 94, 95 (2005) ("GBS is . . . [an] acute inflammatory disorder" that comes and goes rapidly within four weeks), filed as Ex. N (ECF No. 34-1). Lupus and RA, on the other hand, are chronic in nature, resulting in a manifestation of symptoms months or years later. *See* Arbuckle at 1532 (suggesting immune events could occur years before diagnosis of lupus); Kokkonen at 2 (categorizing RA as chronic and suggesting that the relevant antibodies precede development of RA by several years).

den'd, No. 10-565V, slip op. (Fed. Cl. Apr. 29, 2016) (theory that vaccine could promote cytokine upregulation was insufficient to establish injury in question because no reliable scientific evidence supported proposition that cytokine upregulation was pathogenic; petitioner could only show, at best, that the vaccine at issue caused a transient reaction no different from a typical response experienced following infection). It is not a chronic process that goes on and on. Yet Dr. Gershwin proposes, without scientific evidence to bulwark his contention, that a vaccination could sufficiently promote an increase in cytokines to last three months before onset of disease. It is simply an unreliable proposition, based on current science at least.

Second, the theory presented either assumes facts that the record does not reflect, or rests on uncorroborated assumptions. For example, the fact of Petitioner's pre-vaccination UTI is a component of the theory – but there is no record evidence that Petitioner was experiencing any inflammatory condition or symptoms in the months before onset, and no testing that would suggest his cytokine levels or autoantibody levels were abnormal. Alternately, Dr. Gershwin accepts Petitioner's unsubstantiated allegation that he was likely exposed to a flu virus (perhaps due to his wife's work as a nurse) in the late fall of 2014 – and thus bases his opinion in part on speculation, an act that has been deemed to greatly undermine the opinion's reliability. *See, e.g.*, *Pope v. Sec'y of Health & Human Servs.*, No. 14-078V, 2017 WL 2460503, at *20 (Fed. Cl. Spec. Mstr. May 1, 2017) ("[a]n expert opinion based on demonstrably false factual assumptions does not gain heft simply because it comes from an expert; to the contrary, it loses persuasiveness and reliability if its factual assumptions are false") (citing *Davis v. Sec'y of Health & Human Servs.*, 20 Cl. Ct. 168, 173 (1990)).

The somewhat eleventh-hour "antigenic sin" theory fails both on its plausibility and factual basis given the case. It is strongly reminiscent of the "challenge-rechallenge" concept – which is typically best established when a claimant can show that a subsequent exposure to a particular antigen causes a more prompt response (given the immune system's "experience" with the presenting antigen). *See, e.g.*, *Carda v. Sec'y of Health & Human Servs.*, No. 14-191V, 2017 WL 6887368, at *9 (Fed. Cl. Spec. Mstr. Nov. 16, 2017). But here, there is a lack of such evidence. While not wildly implausible, it remains speculation that Mr. Reichert was in fact exposed to the flu virus in late 2014, given the lack of corroborating record proof. And as Dr. Rose pointed out, intervening exposure to the wild virus actually makes it more likely that *this* was the cause of Petitioner's GBS, rather than a flu vaccine he received almost two months before. Tr. at 91-92.

Third, the timing issue *alone* is fatal to Petitioner's claim (and would be even if I had been able to find on this record that the proposed causation theory was otherwise plausible). Regardless of whether the UTI or alleged late-fall flu virus exposure was the "flame," Dr. Gershwin's theory in both instances deemed the vaccine the "oxygen" – and that vaccine was administered 72 days prior to onset. But nothing offered by Petitioner establishes the medical reliability of a theory that GBS could start so long after receipt of the flu vaccine. Petitioner's recourse was to point to other

diseases known to be antibody-mediated, like lupus or RA, arguing that because they can be subclinical for a long time before they manifest (with evidence of antibodies present), it was reasonable to assume the same is possible with respect to GBS. But this is contrary to what is known about GBS. *See* Rose Rep. at 6. It also conflates disease processes that are disparate – for example, RA is not a demyelinating condition – and which develop in wholly distinguishable ways.[12] At bottom, the fact that *some* diseases can be subclinical for long periods of time does not mean the same is true with respect to all autoimmune conditions.

In short, nothing that is known about GBS – even less-common cases that took more than a month to manifest after an initial insult - suggests that it would progress in the lengthy timeframe proposed under Petitioner's causation theory. This seems not to have been lost on Dr. Gershwin, who largely agreed in his testimony that the most plausible timeframe for GBS onset was within eight weeks of exposure to infection or vaccination. *See* Tr. at 16, 56.

Finally, the record itself does not support Petitioner's theory. There is no evidence that Petitioner experienced substantial pre-symptomatic inflammation, for example, that would suggest any immunologic process was ongoing. Petitioner tries to evade this lack of proof by differentiating clinical, observable inflammation from a cytokine-induced inflammatory process, which Dr. Gershwin maintained could occur subclinically. *See* Tr. at 41-42. But if this is the case, what evidence is there that this proposed cytokine process was occurring? What evidence is there that Petitioner was experiencing a subclinical buildup of antibodies? There is none, and here the especially-long, eventless temporal gap from vaccination to onset only highlights the absence of such evidence.

CONCLUSION

A program entitlement award must be supported by a preponderant evidentiary showing. Here, Petitioner has not made such as showing. Petitioner is therefore not entitled to compensation under the Vaccine Program.

In the absence of a motion for review filed pursuant to RCFC Appendix B, the clerk of the

[12] RA, for example, is associated with a specific antibody that is generated in reaction to the body's mistaken production of an amino acid. This process can be contributed to by respiratory/lung problems, going on for years before later resulting in the joint pain and damage characterizing RA. *See generally Olson v. Sec'y of Health & Human Servs.*, No. 13-439V, 2017 WL 3624085, at *22-23 (Fed. Cl. Spec. Mstr. July 14, 2017), *mot. for review den'd*, 135 Fed. Cl. 670 (2017), *appeal docketed*, No. 18-1467 (Fed. Cir. Jan. 24, 2018). RA's pathogenesis is thus wholly inconsistent with GBS (which involves direct, more-sudden attack by autoantibodies generated in response to infection, or in rare cases vaccines, on peripheral nerve myelin).

court **SHALL ENTER JUDGMENT** in accordance with the terms of this decision.[13]

IT IS SO ORDERED.

s/ Brian H. Corcoran
Brian H. Corcoran
Special Master

[13] Pursuant to Vaccine Rule 11(a), the parties may expedite entry of judgment if (jointly or separately) they file notices renouncing their right to seek review.