

Long COVID Fatigue, Depression, 'Brain Fog', and Subluxation: A case report

Charles S Masarsky and Marion Todres-Masarsky

Narrative: A 68-year-old woman presented with fatigue, dry mouth, dry eyes, photophobia, numbness in the feet, and 'brain fog' 7 months after acute COVID-19 infection. She also suffered from a need to frequently stop for breath while speaking. Pre-existing depression was exacerbated by long COVID.

Ten visits for chiropractic adjustments and home care advice were administered over a 7-week period. Partial improvement was noted in the patient's eye comfort, and fatigue was somewhat reduced. The attention deficit component of 'brain fog' was greatly improved as evidenced by the return of the patient's ability to read novels with comprehension and enjoyment. The need to frequently stop for breath while speaking no longer was present by the end of the study.

Possible confounding factors are a complex constellation of pre-existing conditions and polypharmacy. An additional confounding factor may have been hypoglycaemia. This was a problem in the patient's early adulthood and may have been reactivated by long COVID.

During the course of care, pragmatic innovations in clinical assessment ('forced inspiration shrug') and adjusting technique ('gluteal assist' for coccyx adjustment) were developed.

Indexing Terms: Chiropractic; Long Haul COVID; Brain Fog; depression.

Introduction

We have previously reported three cases of long COVID under a course of chiropractic care (Masarsky & Todres-Masarsky, 2022; Masarsky & Todres-Masarsky, 2022; Masarsky & Todres-Masarsky, 2023). The patient described in this paper responded to the same call for subjects (Appendix 1) and executed the same informed consent document (Appendix 2) as did the previous subjects. She was made aware of the call for subjects by her husband, who noticed our flyer when visiting for his own chiropractic care. Questioning regarding the patient's long COVID complaints were partially guided by a list of topics inspired by the *COMPASS 31* questionnaire and a subjective scale of olfactory function, along with our general knowledge of long COVID (Appendix 3; Sletten et al, 2021; Gupta et al, 2013).

... it seems likely that polypharmacy is a universal confounder with respect to long COVID patients ...'



Past History

The patient is a 68-year-old voice teacher and acting coach with episodic back pain (10/10), headache (9/10), shoulder pain (8/10), and knee pain (6/10), with increased severity in all symptoms for one month prior to presentation on 2-21-2024. These symptoms have a significant impact on activities of daily living, including '*standing hurts, walking hurts*'. She is allergic to *erythromycin, Aleve™, honeydew, and penicillin*.

The patient has been diagnosed with high blood pressure, and both parents have had heart 'issues' and strokes. Her pulmonologist has diagnosed her with obstructive sleep apnea, therefore she was instructed to use continuous positive airway pressure (CPAP), and later bilevel positive airway pressure (BiPAP) to assist breathing during sleep. She has had one pregnancy and one child by Caesarean section. She recalls terrible pain during her menstrual periods. She was treated for endometriosis in 1980 with *Danazol™*; she states treatment was '*dreadful*' and ruined her singing voice. Twenty years prior to presentation, she had 5 benign breast tumours removed, and underwent what she described as an unnecessary hernia repair.

She reports poor balance for the past several years (she did not state a precise duration). Also, she reports numbness and a sensation of '*pins and needles*' in the feet which she feels may or may not be related to poor balance. Numbness in feet started after COVID infection. The *Neurology Center of Fairfax* conducted electrophysiological study 6 days prior to presentation including nerve conduction and EMG to rule out lumbosacral radiculopathy/neuropathy. This exam was normal. A skin biopsy to rule out small fibre neuropathy was recommended and may be performed in the future.

She complains of unexpected weight gain and opines this may be related to her many medications (medication list: Appendix 4). Included in her medication regimen are drugs to control depression, anxiety, asthma, allergies, gastroesophageal reflux disease, high blood pressure, hypercholesterolemia, and mild dementia.

Clothing tends to irritate her skin

The patient was diagnosed with COVID-19 on July 12, 2023. This was after singing and dancing without a mask. Acute infection included sinusitis, fatigue, and body aches. After she became COVID negative in August, she took a long car trip. On return, she felt disoriented and fatigued. When asked about problems standing after sitting or lying down, she stated that she felt a bit dizzy (though this existed before COVID), would break into a sweat (pre-existing, but worse since COVID). She has heart palpitations (pre-existing, related to mitral valve prolapse, for which she is taking *Metoprolol™*), and she stated since COVID her heart rate and breathing do not synchronise. For example, she would sometimes experience tachycardia without dyspnea.

She reports dry mouth, plus eyes dry and '*stinging*' since COVID. She reports sensitivity to bright light, stating '*I close my eyes all the time*'. However, she also reports some difficulty seeing and driving at night as well.

She falls asleep '*like a coma*', and wakes up disoriented. She gets tired more easily than she used to before COVID.

When asked about deficits in olfaction and taste, she stated that her sense of taste may actually have improved since COVID.

She did not report any more difficulty in taking a deep breath than before COVID. However, she found she had to stop to take a breath when speaking more often than before COVID. She finds that she is more sensitive to heat than she used to be, yet frequently feels chilled.

Diarrhoea/constipation may not be COVID-related, due to preexisting irritable bowel syndrome (IBS).

Anxiety and depression are sometimes severe.

Findings at Presentation

The patient's height is 5'1.5" (156.2cm), weight 185 lbs (84kg), pulse 79 bpm, %O₂ on pulse oximetry is 97%. Testing for asymmetrical vibration sensation on the cranium was negative. (Masarsky CS, 2023) Her reverse digit span is 5, which is within normal range for adult short-term memory and attention span. Slight reduction in cervical right rotation compared to left rotation was noted on active range of motion. Motion palpation reveals hypomobility C4-5, C7-T1, T8-10, and L1-2 motion segments. Thoracolumbar rotation is normal but painful at the ribs. Single leg balance was not tested due to difficulty balancing during sacroiliac motion testing, which is normal. Right *psaos* inhibition is noted on manual muscle testing.

Interventions and Outcomes

All vertebral and extremity adjustments were high-velocity, low-amplitude diversified adjustments unless otherwise specified. Cranial adjustments were performed with respiratory assist technique, following *Applied Kinesiology* protocols. Neurolymphatic and neurovascular stimulation also followed *Applied Kinesiology* protocols.

2-21-24: Diversified adjustments were administered to T12, the right sacral base, L1, L5, T5, and the left glenohumeral joint. C5 was adjusted with a respiratory assist manoeuvre, and the left *supraspinatus* neurolymphatic reflexes were stimulated following *Applied Kinesiology* protocols. The *yintang* acupressure point was stimulated (Young-Chang et al, 2011). Suboccipital muscles were relaxed by the clinician gently curling his fingers under the inferior border of the supine patient's occiput (suboccipital release).

2-23-24: The patient reported her right shoulder had been uncomfortable, 'barking' in her words. She had been finding it difficult to stand long enough to cook. Diversified adjustments were administered to the left sacroiliac and T12. C1 was adjusted on the left with a thumb flick delivered in side posture. The left *psaos* was addressed with neurolymphatic and K27 acupressure stimulation. The diaphragm was addressed with neurolymphatic and neurovascular stimulation. *Yintang* stimulation and suboccipital release were performed.

Yogic alternate nostril breathing was explained, demonstrated, and practiced. Given the distress the patient's nervous system was clearly in, it was thought that the neurological balancing afforded by this practice would be beneficial (Garg et al, 2016). The patient was advised to practice this form of breathing for at least 3 minutes each day.

Given the history of depression and the use of statins, it was deemed wise to support the patient's mitochondrial function by supplementing with *coenzyme Q-10*. The patient was advised to take the 'bottle dosage' each day, as there is no RDA for *coenzyme Q-10*.

3-1-24: The patient notes that two days prior to this visit she had a flare-up of irritable bowel syndrome symptoms. She amended her intake report regarding difficulty with the standing position, now indicating that she is always wobbly when standing. She states that her depression is '*practically overwhelming*', and she states at times she feels '*shattered*'. She is also suffering from severe fatigue. As of 3 days prior to this visit, she reports compliance with *coenzyme Q-10* and alternate nostril breathing advice. She also related that one thing that improves her emotional state somewhat is '*baby therapy*': looking at a picture of her grandchild.

The neurovascular reflexes for bilateral *pectoralis major clavicular* muscles, also known as '*emotional points*', were stimulated with light digital pressure while she contemplated the '*shattered*' feeling for approx. 2 minutes. She was then asked to shift her attention to '*baby therapy*'.

Diversified adjustment was performed at T12. C3 was adjusted with a respiratory assist technique. Left *psaos* neurolymphatic reflexes were stimulated. *Applied Kinesiology* protocols to correct an open ileocecal valve were administered, and acupuncture was performed at the *yintang* point. *Damon technique* for general relaxation was performed (Damon and Damon, 1939).

3-8-24: The day before this visit, the patient stated she suffered right lower abdominal pain similar to an episode 45 years ago. When asked about her fatigue, she reported that she was "less destroyed" each day. Standing no longer produced sweats, but still caused a wobbly feeling. Failure of HR and breathing to synchronise was still present. Dry mouth was still present, but she opined that this may be due to an increase in her dose of *Nortriptyline*[™], which her psychiatrist had ordered due to the recent severity in depression. Eyes were still dry and stinging, and light sensitivity was still a problem. She reported slight improvement in mental foginess, but stated poor memory and concentration remained unchanged. Stopping to take a breath while speaking was still a problem. Heat sensitivity reportedly was unchanged. She reported compliance with yogic alternate nostril breathing 4 days out of 7.

Diversified adjustments were performed at T10 and L2. Light osseous correction of right pubic bone was performed. Left quadriceps femoris neurolymphatic reflex was stimulated. Pectoralis major clavicular neurovascular reflexes were addressed as before focusing on the 'destroyed' feeling at first, then moving the mental focus to 'baby therapy'.

3-15-24: Wobbliness when standing, dry mouth, eyes dry/stinging and heat sensitivity were reportedly unchanged. In terms of fatigue, the patient reported somewhat more energy from time to time, but she quickly crashes. The need to stop for a breath while speaking and right lower abdominal pain were noticeably reduced. Her mental fog and memory are slightly better, but she occasionally opens a cupboard, then walks away forgetting why she opened it. Her concentration has improved to the point where she is better able to follow plots in novels, which was not possible at presentation.

She has stopped yogic alternate nostril breathing, finding it difficult due to nasal congestion. To replace this, I recommended holding the pectoralis major clavicular neurovascular points while breathing in through the nose & out through the mouth, gently bringing attention to cool inspiration and warm expiration whenever the mind wanders (resilience breathing). I had her practice this for 3 minutes prior to adjustment.

Diversified adjustments were delivered to T7, T12, and L1. C5 was adjusted with respiratory assist technique. Right *psaos* neurolymphatic reflex stimulation was performed. The *yintang* point was addressed, and suboccipital release was performed.

3-22-24: During the previous week, the patient's husband fell ill, so she had to take up the slack regarding household work. In general, her symptoms exacerbated, particularly her feeling of being 'shattered', low back pain and a neck 'crick'. Subluxations at C3 on the left and C5 on the right were addressed with respiratory assist technique augmented by the sitting patient pressing the neck towards the clinician's adjusting hand during inspiration (sit-press technique). T11 was adjusted with diversified technique. Left *psaos* neurolymphatic stimulation was applied. Left expiration assist cranial adjustment was administered. The *yintang* point was addressed. The patient was instructed to practice resilience breathing and was encouraged to experience the warm-cool cycle of breathing as pleasurable.

4-3-24: The patient was originally scheduled for 3-27-24, but rescheduled to 3-29-24 then again to 4-3-24. The reason for this was her psychiatrist prescribed an increase in *Triteptil*[™] dosage in an effort to achieve better mood stabilisation. However, this dose gave her a 'woozy' feeling, leaving her hesitant to drive to the appointment or anywhere else.

She states her fatigue, wobbliness when standing, heart rate/breath asynchrony, mental fog, and heat sensitivity are unchanged, and her mood is 'horrible'. However, her left lower abdominal pain is much better, and she no longer has any need to stop for a breath when speaking. L3 and T6 were adjusted with diversified technique, while C3 and coccyx were addressed with light osseous manoeuvres. Left *psaos* neurolymphatic stimulation was performed. The patient performed resilience breathing in the supine position for 3 minutes with the clinician holding her *pectoralis major clavicular* neurovascular points.

4-10-24: The patient complains of low back pain exacerbation over the past few days, and she feels as if her skull is being 'squashed from without'.

Manual muscle testing indicated the right *latissimus dorsi* was intact. She is asked what sort of sweet she really likes. She replies chocolate is a favourite. The *latissimus dorsi* is retested while she imagines chocolate as vividly as possible. The muscle is very inhibited on re-testing. She is asked what sort of non-sweet food she likes. She replies Indian curry is a favourite. Retest of the *latissimus dorsi* while she imagines Indian curry as vividly as possible indicates an intact muscle.

Asking her what sort of lunch she usually has, she replies peanut butter and jelly or yoghurt with fruit. She also states that she enjoys tea and coffee with sugar in each. She recalls that she suffered from hypoglycaemia as a young adult and controlled it by avoiding sweets and eating more frequently than the usual 3 meals as small portions throughout the day. I advised her to resume eating low on the glycemic index and dividing eating into 6 small meals throughout the day.

She noted that she was scheduled for a visit to a local long COVID clinic on 4-16-24 for physical therapy and occupational therapy. I asked her to let me know what sort of treatment and advice they gave her when she visits for chiropractic again.

I held the *pectoralis major clavicular* neurovascular points while she performed resilience breathing as before approx. 3 minutes. C3, left temporal bulge, and right sphenoid wing were addressed with respiratory assist techniques. Left coccyx was adjusted with light osseous technique. T12, T10, T5 were adjusted with diversified moves. Left sacroiliac was adjusted prone and in side posture. Patient stated her skull felt 'definitely better', and her low back felt 'a little better'.

4-17-24: Although most of the patient's symptoms remain unresponsive, she states her eyes while still stinging are no longer dry. She can follow plots in novels almost at pre-COVID levels, suggesting robust improvement in the attention span component of 'mental fog'.

Evaluation at a COVID centre the previous day revealed her blood pressure to be elevated, therefore a beta blocker was prescribed. Physical therapy and occupational therapy will focus on balance and stamina. She was advised to use a *Rollator* for travel, and a brace for her back.

Pectoralis major clavicular neurovascular points were held without specific directions to the patient for 3 minutes. Right occiput was adjusted with respiratory assist technique. L5, T12, T10, left glenohumeral joints were addressed with diversified adjustments. Soft tissue manipulation over left and right *iliolumbar ligaments*, bilateral *quadratus lumborum* neurolymphatic points, and left *supraspinatus* neurolymphatic points were performed. Suboccipital release was administered.

4-29-24: The research protocol was now over, and I was seeing the patient primarily for help with musculoskeletal problems. However, I still inquired about her long COVID manifestations. Neck pain and headache were both rated at 6/10, shoulder pain 8/10; bilateral knee pain 6/10. Back pain was present, but the patient could not be clear about the intensity. Improvement in mental concentration continues, and she is able to read and complete novels

with enjoyment. However, she still forgets why she opens a drawer. In terms of fatigue, long walks are still difficult. She has not begun to comply with hypoglycaemia diet, due to disrupted schedule with travel. Her blood pressure the previous day was 169/112 mm/Hg and 146/104 mm/Hg. Measurement on this day is 150/98 mm/Hg.

With the patient supine, the clinician's fingers were curled under the occiput as if performing a suboccipital release. Then, the patient was asked to perform a forced inspiration through pursed lips, as if sucking in air through a straw. This inspiration created a more robust inferior motion at the right side of the occiput than the left, suggesting an asymmetry in the tone of such cervical muscles as the *sternocleidomastoid*, *upper trapezius*, and *suboccipital* muscles (positive forced inspiration shrug). The clinician reasoned that a cervical or cranial subluxation is probable in the presence of a positive forced inspiration shrug. Palpation and challenge revealed a right occipital subluxation, which was corrected with a respiratory assist technique. After this the forced inspiration shrug test was found to be negative (tone bilaterally equal).

T11/12 and T5 were adjusted with diversified technique. Left *psaos* neurolymphatic reflexes were addressed.

With the patient gradually elevating her arms, the clinician observed the movement of the scapulae. The right scapula began to move much sooner than the left. To improve right scapulohumeral rhythm, the clinician held a lateral-to-medial pressure on the lateral border of the right scapula as the patient elevated her right arm. When the scapula began to move, the patient was asked to press her arm downward against the clinician's resistance for a few seconds, then resume the arm elevation. This was repeated several times.

Palpation and challenge indicated a right and anterior misalignment of the coccyx. The clinician decided to augment the usual light osseous correction with assistance by the contralateral *gluteus maximus*, given that slip of this muscle attaches to the posterior/lateral coccyx (gluteal assist). The clinician placed his thumb along the gluteal crease to the left side of the coccyx. The supine patient was instructed to raise her left thigh off the table, while the clinician exerted a traction force on the soft tissue in a left and superior direction. After several seconds of holding this position, the clinician thrust the soft tissue in a left and superior direction. Post-adjustment palpation and challenge indicated a successful correction.

The patient performed three minutes of resilience breathing.

Discussion

While the patient experienced some relief from fatigue and experienced improvement in her eye dryness, her most robust improvements were in mental focus (ability to read a novel with comprehension and enjoyment), and her ability to speak normally without stopping to take a breath. The rest of her symptom picture was unresponsive. Two factors possibly explain the absence of additional improvement: pre-existing conditions and polypharmacy.

Long COVID potentially disturbs practically any bodily function. As such, it can be thought of as a universal exacerbator. This patient's pre-existing conditions included multiple allergies, dermatitis when wearing clothing, balance problems, high blood pressure, hypercholesterolemia, obstructive sleep apnea, anxiety, depression, and gastroesophageal reflux disease. Any or all of these could reasonably be expected to worsen in the face of such a potent exacerbator as long COVID.

The patient's medication list is extensive (Appendix 4). A daunting constellation of potential side effects accompanies most of these drugs, with the interactions between drugs being unpredictable. It seems implausible that this situation would improve a patient's resilience in the face of long COVID. In this sense, it seems likely that polypharmacy is a universal confounder with

respect to long COVID patients. Indeed, some support for this idea can be found in a study conducted at the College of Pharmacy of the University of Houston. It concluded that polypharmacy (defined as 5 or more medications every day) is a significant risk factor for poor outcomes among COVID-19 patients (Iloanusi, 2021). Unfortunately, the Iloanusi paper and other similar studies focused on hospitalisation and mortality during acute infection. Hopefully, there will be increased attention to the effect of polypharmacy on the long COVID victim going forward. Another change to be hoped for is for medical practitioners to make every effort consistent with patient safety to simplify the medication regimen in cases of polypharmacy in general and COVID-19 cases with polypharmacy in particular.

In the 4-10-24 visit, *latissimus dorsi* testing while the patient imagined sweet and non-sweet foods suggested a glucose handling problem. While this is certainly not a conventional pathway to diagnosis, when viewed in the light of the patient's hypoglycaemia earlier in life, a glucose-handling component in her clinical picture seems plausible. In any event, advising a diet low on the glycemic index while eating multiple small meals during the day would not seem to put the patient at any risk, and her previous success with such a regimen suggests that it may very well help. As of this publication, there has not been enough time to gauge the influence of this dietary advice.

A growing body of evidence suggests that one feature of long COVID is depressed mitochondrial function, sometimes called '*mitochondrial hijacking*' (Stefano et al, 2021; Sun et al 2022). Glucose metabolism and mitochondrial function are opposite ends of the same process, energy production via cellular respiration. If the patient in this report indeed suffers from mitochondrial hijacking related to long COVID, this could conceivably have reactivated hypoglycaemia, which was apparently under control until her COVID-19 infection.

Combining self-stimulation of the pectoralis major clavicular neurovascular points with "resilience breathing" as described in during the 3-15-24 visit may be relevant to glucose metabolism as well. Applied Kinesiology protocols understand these reflexes to benefit emotional state. Regulation of emotional state would reasonably be expected to benefit glucose metabolism. In any event slow, rhythmic breathing generally benefits autonomic nervous system function.

Another important aspect of cellular respiration is the availability of *coenzyme Q-10* from the diet, from the patient's own biosynthesis, or both. Our patient is on a statin prescription. Statins have been found to disrupt *coenzyme Q-10* biosynthesis (Tan, 2017). With this in mind, *coenzyme Q-10* supplementation seems wise for those undergoing the '*perfect storm*' of long COVID mitochondrial hijacking combined with statin use.

There is no 'gold standard' for a chiropractic approach to the long COVID patient. Given the complexity of the situation, standardisation is unlikely and probably inappropriate. In particular, the patient reported here was quite complex. Hopefully, that makes understandable the visit-to-visit variation in technique. Indeed, pragmatic innovations such as the '*forced inspiration shrug*' for clinical assessment and the '*gluteal assist*' for the coccyx adjustment were introduced at the 4-29-24 visit. When dealing with complex situations such as the long COVID patient, the clinician is forced to learn new things, and may be motivated to innovate.

Conclusion

To date, we have reported four long COVID cases. In each case, the patient benefited from Chiropractic care. The patient reported in the current paper experienced significant relief from the need to stop for breath while speaking and some component of 'brain fog' even in the face of a complex pre-COVID history, polypharmacy, and possible resurgent hypoglycaemia. We suggest involvement of chiropractic practitioners in the care of long COVID patients should become routine, and this change should happen as soon as possible

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Conflict of Interest

The authors report no conflict of interest.

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See also

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Appendix 1: Call for Subjects

Call for Research Volunteers: Long Haulers (COVID)

What Is Our Hypothesis (Research Question)?

It is not uncommon for COVID-19 survivors to have residual problems for weeks or months after the fever and acute symptoms are gone. These people are sometimes referred to as “long haulers”. Common long-haul symptoms include headache, fatigue, attention deficit, and difficult breathing.

We know from both published research and our own clinical experience that chiropractic adjustments often help people with these symptoms whether or not they are infection related. The possibility that chiropractic adjustments can help people with these same symptoms post-COVID seems reasonable.

In a previous newsletter, we provided a brief discussion of a COVID-19 survivor who had lost her sense of smell and seemed to regain it immediately after her adjustment.

Our hypothesis: *In some cases, chiropractic adjustments can reduce the severity of COVID-19 long-haul symptoms.*

How Do You Qualify for the Project?

We are calling for volunteers who are COVID-19 survivors with lingering symptoms who have had no chiropractic care for at least one month. We will need written documentation of your COVID-19 diagnosis. If you may still be contagious, we will delay your participation.

What Can You Expect During Your Participation?

If you are an established patient, we will perform a brief case history and exam focused on your long-haul symptoms as well as our usual chiropractic checkup. If appropriate, an adjustment will be performed. This visit will last approximately 30 minutes.

If you are a new patient, we will perform the same case history and examination that any other new patient would experience, along with specific questions related to long-haul symptoms. If appropriate, a chiropractic adjustment will be performed. This visit will last approximately one hour.

There will be two follow-up visits for additional chiropractic adjustments, lasting approximately 15 minutes each. At the fourth and final research visit, a progress exam will be conducted.

What Will We Do with the Data?

We hope to publish these cases in a peer-reviewed, indexed clinical journal. Published papers will not include your name or any information that can be used to identify you. Your privacy and your safety will always be our paramount consideration.

Will There Be Payment?

This research is not grant-funded, so we cannot offer cash payment. All chiropractic services received as part of your participation in this research will be free of charge.

Contacting Us

If you are interested in volunteering, or if you have a friend or family member who would like to, contact us by phone: 703-938-6441. Feel free to spread the word by forwarding this e-mail, or by copying and sharing this flyer.

Thank you!

Appendix 2: Consent for Research Participation

VIENNA CHIROPRACTIC ASSOCIATES, P.C.

243 Church Street NW, #300-B, Vienna, VA 22180

703-938-6441

Directors: Charles S. Masarsky, D.C. & Marion Todres-Masarsky, D.C.

Thank you for helping us investigate the chiropractic management of long-haul COVID-19 symptoms.

We will measure the severity of your symptoms before and after a brief series of chiropractic adjustments.

We are committed to your safety and well-being during your participation in this research, as we would be with anyone under our care. Nevertheless, you have the right to withdraw your participation at any time for any reason.

We hope this research leads to publication in a clinical journal. In compliance with standard rules for such publications, we will not reveal your name, initials, unique characteristics, or any other information that poses a foreseeable threat to your privacy.

“I have read the above, asked any questions I have about the project described, and I understand the information presented. I consent to participate.”

Printed Name of Participant: _____

Signature of Participant: _____

Today's Date: _____

Appendix 3: History Questions Relevant to Long COVID

Some History Questions Relevant to Long COVID (discuss frequency, severity, + whatever other details patient can add)

Autonomic Function

Since COVID, when standing after sitting or lying down do you feel:

- Dizzy?
- Shaky/weak?
- Do you break into a sweat?
- Does your vision blur?
- Does your heart race (palpitations)?

Do you get dry mouth more than you used to? Excess salivation more than you used to?

Do you get dry eye more than you used to? More tearing up than you used to?

Are you experiencing more diarrhea than you used to? More constipation than you used to?

Do you have more difficulty emptying your bladder than you used to?

Are you more sensitive to bright light than you used to be?

Do you have more difficulty seeing/driving at night than you used to?

Olfactory Function

Since COVID, what score would you give your sense of smell if “0” means you are unable to smell anything, and “5” is completely normal sense of smell?

If your score is less than “5”, do you find yourself using more salt and other seasonings?

Cognitive Function

Do you have more trouble concentrating than you used to?

Do you have more trouble with your memory than you used to?

Do you feel more mentally “foggy” than you used to?

Breathing

Do you have more trouble than before taking a deep breath?

Do you have to stop to take a breath when speaking more often than you used to?

Endocrine (Glandular)

Do you get tired more easily than you used to?

Do you have less sex drive than you used to?

Are you more sensitive to heat or cold than you used to be?

Do you have more of a craving for salt than you used to?

(Sletten et al, 2012; Gupta et al, 2013)

Appendix 4: Medication List

DRUG	PURPOSE
Deplin™	Normalize folic acid metabolism to manage depression
Diltiazem™	High blood pressure control
Flonase™	Allergy relief
Levocetirizine™	Allergy relief
Lorazepam™	Anxiety relief
Losartan™	High Blood pressure control
Memantine™	Dementia management
Metoprolol™	High blood pressure control and heart rate management
Modafanil™	Improve attention
Montelukast™	Asthma relief
Nortriptyline™	Manage depression
Oxcarbazepine™	Mood stabilization (off-label use of anti-seizure drug)
Pantoprazole™	Manage gastroesophageal reflux disease
Pepcid™	Manage gastroesophageal reflux disease
Rosuvastatin™	Manage hypercholesterolemia
Tylenol™	Pain management
Valacyclovir™	Manage herpetic infection
Vilazodone™	Manage depression
Xopenex™	Asthma relief
Alpha Lipoic Acid	Nutritional supplement
L-Theanine	Nutritional supplement
Krill Oil	Nutritional supplement
Probiotic/prebiotic	Nutritional supplement
Quercitin	Nutritional supplement
Vitamin D3	Nutritional supplement