TERNARY HEALTH · LAUNCHPAD

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A starter framework for your condition.

Long COVID (PASC) — ME/CFS-dominant phenotype with autonomic features.

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SAMPLE · NOT A REAL PATIENT RECORD

Launchpad is an organizational and readiness tool. It helps you understand your condition, prepare for productive specialist consults, and assemble the inputs you would need for a Precision Deep Dive. It is not a diagnosis, not a treatment plan, and not clinical advice. Use with your own physicians.

SECTION 01 / ABOUT YOUR CONDITION

Long COVID, in plain terms.

Long COVID — formally Post-Acute Sequelae of SARS-CoV-2 (PASC) — is a multisystemic syndrome that persists or develops after the acute phase of a SARS-CoV-2 infection. The WHO definition (October 2021) describes symptoms continuing for at least three months, lasting two or more months, and not explained by an alternative diagnosis.

Prevalence and demographics.

The U.S. National Center for Health Statistics estimates roughly **11% of adults previously infected with SARS-CoV-2 develop Long COVID**. Global estimates from peer-reviewed pooled cohorts run higher (around 43% of post-acute COVID-19 patients reporting at least one persistent symptom), reflecting different methodologies and definitions. Women, working-age adults (30–55), and people with prior autoimmune or post-viral illness are over-represented.

Recognized phenotypes.

Long COVID is not a single disease. Current research divides it into overlapping but clinically meaningful subtypes:

- **ME/CFS-dominant.** Post-exertional malaise (PEM) is central. Fatigue, cognitive symptoms, and unrefreshing sleep dominate. This is the slowest-recovering phenotype.
- **Cardiovascular / autonomic.** POTS, orthostatic intolerance, and exercise intolerance dominate. Roughly 30% of Long COVID cases meet POTS criteria.
- **Cognitive / neurological.** Brain fog, executive dysfunction, sometimes small fiber neuropathy dominate.
- **Respiratory.** Persistent dyspnea, exercise desaturation, sometimes interstitial findings on imaging.
- **Mixed / multisystem.** Most patients fall here. Multiple phenotypes overlap; the dominant cluster guides initial workup.

Common misdiagnoses.

Long COVID is frequently misattributed before recognition. The most common labels patients carry first: generalized anxiety, depression, deconditioning, migraine, atypical chest pain, "post-viral" with no follow-up, and (in younger patients) "anxiety with somatic symptoms." Each of these can co-exist with Long COVID but is rarely the primary explanation.

WHAT CHANGED RECENTLY (2024-2026)

Research has moved meaningfully in the last 18-24 months. A patient reading this document today knows more about Long COVID than most primary care physicians have had time to absorb.

- **Microclot evidence consolidated.** Thierry et al. (J Med Virol, Oct 2025) confirmed fibrin amyloid microclots associated with neutrophil extracellular traps in Long COVID samples. A July 2025 bioRxiv study demonstrated that the SARS-CoV-2 spike protein S1 fragment can independently induce fibrinolysis-resistant microclots.
- **LDN mechanism validated.** A 2025 study (Cabanas et al., Frontiers in Immunology) showed low-dose naltrexone restores TRPM3 ion channel function in NK cells of Long COVID patients — a mechanistic foundation under the clinical signal. A September 2025 systematic review (medRxiv) pooled four cohort studies showing LDN benefit in fatigue and cognitive symptoms.
- **RECOVER-TLC trial portfolio matured.** The NIH RECOVER program now has multiple active or imminent trials: Paxlovid (n=964, results pending), Baricitinib (large add-on trial active), IVIG for severe POTS and Ivabradine for moderate POTS, structured pacing for PEM (RECOVER Energize, n=600), sleep agents (Sunosi, modafinil, melatonin), and a pivotal LDN trial enrolling summer 2026 designed for potential FDA registration. Results expected through late 2026.
- **Pacing has become the standard of care for PEM-dominant cases.** Graded exercise therapy (GET) is increasingly recognized as harmful for the ME/CFS-pattern phenotype. The Workwell Foundation pacing protocol and heart-rate-ceiling methods are mainstream at LC-experienced centers.
- **Histologic small fiber neuropathy confirmed.** Multiple 2024-2025 studies have documented small fiber neuropathy on skin biopsy in Long COVID patients with pain and autonomic symptoms — strengthening the physical basis of symptoms that were previously called functional.

Prognosis basics.

Long COVID recovery is uneven. Cohort data suggests roughly 30-40% of patients report significant improvement at 12-18 months from onset, but plateau is common and recovery is rarely linear. The ME/CFS-dominant phenotype recovers slowest; cardiovascular-dominant phenotypes often respond well to targeted treatment of the autonomic component. Most patients eventually reach a stable functional level — which may be full recovery, may be 60-80% of prior baseline, or may require long-term accommodation. The honest answer is that no clinician can predict your trajectory with confidence at this stage of the science.

SECTION 02 / THE LANDSCAPE — TESTS, TREATMENTS & RESEARCH

What exists, what's emerging, what's worth knowing.

The Long COVID treatment landscape is wider than most patients are told. Below is the menu — established treatments, off-label options with credible evidence, lifestyle and supplement categories, and the active research that may change the picture in the next 12-24 months.

Tests worth knowing about.

CATEGORY	SPECIFIC TESTS	WHAT THEY HELP ESTABLISH
Cardiology / autonomic	Tilt table test, NASA Lean Test, 24-hour Holter monitor, echocardiogram	Whether POTS or other dysautonomia is present; baseline cardiac function
Standard blood panels	CBC, CMP, ferritin, vitamin D, B12, folate, thyroid (TSH/Free T4/Free T3)	Rule out treatable contributors (iron deficiency, thyroid dysfunction, vitamin deficiency)
Inflammatory markers	hsCRP, ESR, D-dimer, fibrinogen	Document chronic inflammation; D-dimer may be elevated in microclot-related cases
Viral reactivation	EBV reactivation panel (VCA IgM, EA-D, EBNA-1), HHV-6, CMV	Common in ME/CFS-pattern Long COVID; may guide antiviral consideration
Autoimmune	ANA, ENA panel, autonomic ganglionic antibodies	Rule out frank autoimmune disease; some Long COVID involves autoantibody activity
Endocrine	AM cortisol, ACTH stimulation, aldosterone, renin	Adrenal insufficiency and HPA axis dysfunction are real in subsets of LC
Cardiopulmonary	Cardiopulmonary exercise test (CPET), two-day if ME/CFS suspected	Gold-standard documentation of ME/CFS post-exertional malaise — but carries real risk of triggering crash. Decide with specialist.

Treatment categories.

Established / standard-of-care at LC-experienced centers.

- **Heart-rate-based pacing for PEM-dominant cases.** Not optional. Heart-rate ceilings (typically 60% of max predicted HR) plus structured activity envelopes. The Workwell Foundation and Bateman Horne Center maintain protocols.
- **Pharmacologic management of POTS subset.** Low-dose beta-blockers (propranolol), ivabradine (HR control without beta-blockade), midodrine, fludrocortisone, salt loading, compression garments.
- **Treatment of identified deficiencies.** Vitamin D, B12, iron — common and worth fixing.

Off-label with credible evidence base.

- **Low-dose naltrexone (LDN).** Most-studied off-label intervention. Open-label cohorts and pooled systematic reviews support benefit in fatigue and cognitive symptoms. Pivotal RCT enrolling 2026.
- **NAD+ augmentation.** Combined LDN + NAD+ cohort (Isman 2024) showed improvement. Mechanism plausible (mitochondrial); evidence still pre-RCT.
- **Mestinon (pyridostigmine).** Increasingly used in autonomic-dominant LC; evidence emerging.
- **Antihistamines and mast-cell stabilizers.** For MCAS overlap (real in some LC); H1+H2 blockade plus cromolyn.
- **Extended-course antivirals.** Paxlovid extended course is in trials. Valacyclovir/famciclovir used at some centers for EBV reactivation patterns. Research-active.

Conservative / lifestyle approaches.

- **Energy envelope management.** Heart-rate-based pacing, activity logging, planned rest.
- **Sleep optimization.** Rigorous sleep hygiene; treatment of sleep apnea if present; sometimes melatonin or trazodone for sleep architecture.
- **Anti-inflammatory nutrition.** Mediterranean pattern is most-studied. Low-histamine if MCAS features. Caffeine and alcohol moderation matter.
- **Stress and autonomic regulation.** Vagal tone work (cold exposure, breathwork), trauma-informed approaches.
- **Cognitive rehabilitation.** Speech-language pathology referral; cognitive pacing techniques.

Supplement categories with rough evidence base.

- **Mitochondrial support:** Coenzyme Q10, NAD+ precursors (NMN, NR), creatine, L-carnitine.
- **Anti-inflammatory:** Omega-3 EPA/DHA, curcumin.
- **Mast cell / histamine:** Quercetin, vitamin C, DAO enzyme supplementation.
- **Sleep:** Magnesium glycinate, L-theanine, glycine.
- **Repletion (when deficient):** Vitamin D3, methylcobalamin B12, iron bisglycinate, magnesium.

Procedural / surgical.

- Generally not applicable to Long COVID itself.
- Stellate ganglion block has anecdotal reports for autonomic symptoms; evidence remains thin.
- Apheresis for microclots is being studied; not FDA-approved for LC indication; risk-benefit unclear.

Active research worth tracking.

The NIH RECOVER program (recovercovid.org) is the largest Long COVID research initiative. RECOVER-TLC is the treatment-trials arm. Key active or pending trials: Paxlovid, Baricitinib, LDN (pivotal), IVIG/Ivabradine for POTS, structured pacing, sleep agents, GLP-1 agonists. Most results expected late 2026. Patient registries worth knowing about: PolyBio Research Foundation, Yale LISTEN study, Stanford PASC clinic registry.

SECTION 03 / BASED ON WHAT YOU TOLD US

Categories to focus on first.

> READ THIS FIRST
>
> The recommendations below are **general directions based on what you have told us so far**. They are not personalized clinical recommendations. To say anything specific — which test, which dose, which provider — we would need your records, labs, imaging, and a deeper case review. Use this section to orient your thinking and your conversations with your physicians.

From your intake, your case fits an ME/CFS-dominant Long COVID phenotype with significant autonomic features. Several categories from Section 02 are likely to matter most for someone with this profile.

Pacing is foundational, not optional.

For the ME/CFS-pattern phenotype, structured heart-rate-based pacing is the single most-replicated benefit in the literature. Graded exercise therapy is contraindicated. Before pursuing any other intervention, a 4-6 week pacing baseline is worth establishing.

Autonomic workup is high-yield.

Your orthostatic pattern and tachycardia-on-standing description suggest POTS-spectrum dysautonomia, which co-occurs in roughly 30% of Long COVID cases. Formal autonomic testing (tilt or NASA Lean) changes both monitoring and medication strategy if positive.

Sleep dysfunction deserves its own workup.

Unrefreshing sleep is a core ME/CFS feature, but it also has treatable contributors (sleep apnea, restless legs, circadian misalignment). A sleep study and a separate sleep-focused consult often produce independent benefits.

Treatment categories worth discussing with your physician.

Several categories from Section 02 are commonly explored in cases like yours. We are listing the **categories**, not specific prescriptions, because the right choice depends on your full picture.

— Opioid antagonist therapy (most-studied agent: LDN)

— POTS-directed pharmacotherapy if autonomic testing confirms it

- Mitochondrial support and repletion of common deficiencies
- Sleep architecture intervention
- Mast-cell-stabilizing trial if MCAS features emerge

REALISTIC EXPECTATIONS

Honest framing — not foundation-website optimism. Long COVID recovery is non-linear. Setbacks are normal. A patient with your phenotype and 60-month duration is in the slowest-recovering group, but is also one where multi-modal approaches tend to compound over time.

What the research suggests for cases like yours:

- Single interventions rarely transform symptoms. Multi-modal approaches (pacing + LDN + autonomic management + sleep + nutrition) tend to produce additive, gradual improvement.
- Plateau at 60-80% of prior baseline is a real possible outcome for ME/CFS-dominant cases. Planning for that emotionally is worthwhile parallel work.
- The fact that you are working part-time at 60 months is itself a marker of relative resilience. Many ME/CFS-pattern LC patients cannot work at all.
- RECOVER trial results expected in late 2026 may change the treatment menu meaningfully. The next 12-18 months of trial readouts are worth watching.
- Recovery, when it happens, is often gradual enough that the patient does not notice month-to-month. Quantitative tracking (HR, HRV, activity tolerance) is how you detect it.

The honest answer is that no clinician can tell you with confidence where you will land. What we can say is that the patients who do best are systematic about their tracking, multi-modal in their approach, and patient with the timeline.

SECTION 04 / QUESTIONS TO BRING TO EACH CONSULT

What to ask each kind of doctor.

A specialist consult is much more productive when you arrive with structured questions. The questions below are written for the specialist categories most relevant to your case. Bring them — printed or on your phone — to the appointment.

For an ME/CFS or Long COVID specialist

- Given my ME/CFS-pattern phenotype, do you treat my case differently from a non-ME/CFS Long COVID profile? What changes?
- What is your protocol for initiating low-dose naltrexone (LDN), and at what dose and duration would we declare partial vs non-response?
- What is your view on extended-course antivirals (Paxlovid, valacyclovir) for cases at my duration?
- Are you participating in or have access to any of the active RECOVER trials?
- What metrics do you want me to track between visits, and how often do you typically follow up?
- Under what circumstances would you refer me to a tertiary center (Stanford PASC, Bateman Horne, Mt Sinai)?

For an autonomic specialist or cardiologist

- If formal testing confirms POTS, which first-line agent do you favor for ME/CFS-pattern Long COVID — beta-blocker, ivabradine, midodrine, or fludrocortisone?
- How do you distinguish neuropathic POTS from hyperadrenergic and hypovolemic subtypes, and does it change treatment?
- What heart rate variability metrics should I monitor at home between visits?
- Do you recommend compression garments and salt loading as adjuncts for my profile? What protocol?
- Under what circumstances would IVIG be considered?

For your primary care physician

- Can you order the EBV reactivation panel and D-dimer that I have not had yet?
- Will you write the LDN prescription (filled at a compounding pharmacy) if a specialist recommends it?
- What is the best way to document my condition if I need disability accommodation or FMLA paperwork?
- Can you help coordinate my specialist referrals and consolidate records across providers?
- What is your follow-up cadence preference — every 3 months, every 6 months, on flare?

For a sleep specialist (if pursued)

- Beyond ruling out apnea, what does your evaluation of unrefreshing sleep in ME/CFS-pattern Long COVID look like?
- What are your views on pharmacologic options (trazodone, low-dose mirtazapine, melatonin) for this profile?
- What at-home sleep tracking metrics are most useful between visits?

SECTION 05 / NEXT STEPS

Your first 30 days, and what to gather along the way.

Two parts. First, a 30-day preparation checklist — the practical actions that get you organized and into the right system. Second, a data and testing checklist — what to gather, where to get it, and what we would want to see if you decide to go deeper.

Your 30-day preparation checklist.

01 **Establish a structured energy envelope log.** Set a heart rate ceiling (typically 60% of max predicted HR — for age 42, around 107 bpm) and log adherence + crash episodes daily for 14 days. Use the Visible app, Bearable, or a paper diary.

02 **Order missing baseline labs.** Through your PCP: EBV reactivation panel (VCA IgM, EA-D, EBNA-1), D-dimer, repeat ferritin, hsCRP, vitamin D 25-OH. Inexpensive, immediately informative.

03 **Submit specialist intake forms.** Bateman Horne Center (Salt Lake City, telehealth-friendly), Stanford PASC Clinic, Mt Sinai Center for Post-COVID Care. Wait times are typically 6-10 weeks; submit now.

04 **Schedule autonomic workup.** Regional cardiology with POTS experience, or tertiary center. Either tilt table test or NASA Lean Test.

05 **Compile your medical records.** Last 5 years on a single drive (digital + paper backup). Specialists will request this; having it ready compresses the timeline.

06 **Connect with patient community.** Long COVID Action Project, Body Politic, Patient-Led Research Collaborative. Useful for navigation tactics and emotional support.

07 **Document baseline symptom severity now.** Before any new intervention, so you have a comparator. Photo of the diary entry counts.

08 **Identify your local PCP relationship.** If your current PCP is not LC-aware, find one who is. The Spinal CSF Leak Foundation directory and US Long COVID provider lists are starting points.

Tailored data and testing checklist.

Most patients with Long COVID benefit from gathering data across six categories. Below: what to gather and where to get it. No pricing — costs vary by insurance, geography, and provider.

01 / WEARABLE & CONTINUOUS DATA

Heart rate, HRV, sleep, activity

For ME/CFS-pattern Long COVID, continuous HR data is the most important wearable input. It enables heart-rate-ceiling pacing and tracks recovery objectively.

What to gather: Continuous HR (24/7), heart rate variability, sleep stages and duration, daily step count, resting heart rate trend.

Where: *Apple Watch (best ecosystem integration), Garmin (best HR accuracy at activity ranges), Whoop (best HRV + recovery scoring), Oura Ring (best sleep tracking), Polar H10 chest strap (gold standard HR accuracy for paced activity).*

02 / BLOOD WORK

Standard panels, inflammatory, viral, autoimmune

Most labs relevant to Long COVID can be PCP-ordered. Some specialty panels may require a specialist referral or direct-to-consumer ordering.

What to gather: CBC, CMP, lipid panel, ferritin, vitamin D 25-OH, B12, folate, thyroid panel (TSH, Free T4, Free T3), hsCRP, ESR, D-dimer, EBV reactivation panel, HHV-6 IgG/IgM, ANA, AM cortisol.

Where: *Your PCP through standard insurance is the cheapest path. For self-ordered labs: Quest Diagnostics direct (questhealth.com), Labcorp OnDemand, Function Health (annual membership model), Marek Health, Ulta Lab Tests.*

03 / DEXA / BODY COMPOSITION

Bone density, body composition baseline

Useful baseline for any chronic illness, particularly if long-term steroid exposure, restricted activity, or nutritional concerns are factors. Not core to LC diagnosis.

What to gather: DEXA scan for bone mineral density and body composition (fat / lean mass distribution).

Where: *BodySpec (mobile DEXA, multi-city), DexaFit (fitness-oriented chains), or hospital radiology departments (physician-ordered).*

04 / GENOME / GENETIC TESTING

Susceptibility and pharmacogenomic context

No single gene predicts Long COVID, but several variants influence severity and treatment response. Worth obtaining if not already done.

What to gather: Consumer screening for HLA-DRB1, MTHFR (C677T, A1298C), COMT (rs4680), ACE I/D polymorphism, and broader pharmacogenomic markers. Whole genome sequencing if a deeper picture is wanted.

Where: *23andMe or AncestryDNA (consumer-level, then upload raw data to Promethease or SelfDecode for variant analysis). Nebula Genomics (whole genome sequencing, consumer). Invitae, GeneDx (clinical-grade, physician-ordered).*

05 / IMAGING

Cardiac and (selectively) neurological imaging

For ME/CFS-dominant LC, imaging is rarely diagnostic of LC itself, but is useful for ruling out alternatives and characterizing the autonomic and cardiovascular workup.

What to gather: Echocardiogram (cardiology baseline), 24-hour Holter monitor (cardiac rhythm), brain MRI with contrast (if cognitive symptoms prominent or to rule out structural causes), CPET (only at LC-experienced centers — decide risk-benefit with specialist).

Where: *PCP-referred at standard imaging centers for echo and Holter. Brain MRI via neurology referral. CPET only at academic medical centers with LC programs.*

06 / LIFESTYLE TRACKING

Symptoms, energy, triggers, food

The single most valuable input for any LC clinician is a quantitative symptom and pacing log. It is also the input most patients underweight.

What to gather: Daily symptom severity (fatigue, brain fog, OI, pain) on a 0-10 scale; energy envelope adherence; trigger log (what produces crashes); medication and supplement log with start/stop dates; menstrual cycle correlation if relevant; food diary if MCAS features.

Where: *Visible app (LC-specific, free tier exists), Bearable (general symptom tracking), Health Storylines, Cronometer (for nutrition), or paper log. Whichever you will actually keep.*

IF YOU DECIDE TO GO DEEPER

What we would want to see for a Precision Deep Dive.

If you decide to engage Ternary Health for a full Precision Deep Dive ($6,500, 40-60 pages, personalized clinical action plan), the inputs below would shape what we can deliver:

- Complete medical records, last 5 years minimum
- All lab work within the last 12 months (including the panels recommended in Section 02)
- Imaging on CD or via PACS export — raw DICOM files, not just radiologist reports
- Genetic testing raw data (23andMe, GeneDx, or whole genome)
- 4+ weeks of wearable data (HR, HRV, sleep, activity) exported as CSV
- Detailed symptom and pacing diary, minimum 4 weeks
- Current medications and supplements with doses, start dates, and observed responses
- Family medical history (3 generations if available)
- Insurance information for specialist coordination

What a Precision Deep Dive adds. Beyond this Launchpad's scope: a personalized 40-60 page clinical action plan with named providers matched to your case, specific interpretation of your labs and imaging, a personalized disease model identifying the drivers in your specific case, ranked interventions with leverage scoring, a 90-day execution roadmap with named medications and decision gates, and 30 days of asynchronous follow-up support.

Launchpad credit. Your $400 Launchpad fee credits toward a Precision Deep Dive booked within 90 days.

Prepared with the same methodology applied to every Ternary engagement — scoped to the Launchpad tier ($400). Built on the published Long COVID literature through Q2 2026, with primary references available on request.

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