PRISM HEALTH

CASE REVIEW

REPORT DATE | 2026-09-27

Client Care Report

We looked at your health through a new lens.

NAME	CASE ID	INTAKE COMPLETED	PREPARED BY
Client	PR-2609-C	2026-09-27	Prism Care Team

ANALYSIS FRAMEWORK

Bioenergetic root-cause review of questionnaire, take-home measurements and laboratory testing.

IMPORTANT

The information in this report is educational and is not medical advice. Review it with your physician before starting, stopping or changing any medication, supplement or diet.

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MARKER STATUS

- Inside the Prism range
- Borderline, watching
- Outside the Prism range

MARKER BAR

Green band is the Prism target range. The vertical mark is your result.

BIOENERGETIC IMPLICATION

BLACK PANELS

Every pattern closes with one. That is where the mechanism is explained rather than described.

Introduction

Personalized health report

This report covers a lot, because your case has a lot going on. You work in healthcare on an early schedule, and you can date the change in your health to one month: July 2021. That month you had COVID, then a Pseudomonas skin infection on your inner thigh, then penicillin-class antibiotics followed by ciprofloxacin. Since then you have gained about 40 lb. You have had brain fog, irritability and restlessness rated 5 out of 5. Your gut has never settled, your sleep is unrefreshing, and your drive and morning erections have faded. Three years of gastroenterology and urology visits mostly told you your labs were normal.

Your food log shows you are eating about 2,250 kcal a day at 269 lb while exercising five to six days a week. **Your weight is not caused by overeating or laziness. It is a metabolic problem.** You have probably been assuming the opposite for four years, and it isn't true.

How we look at health. Every tissue in your body runs on energy made by the mitochondria, the small structures inside each cell that turn food and oxygen into usable energy (ATP). When energy production is strong, digestion, hormone production, brain function, immunity and tissue repair all work well. When something blocks it, the body falls back on stress hormones (adrenaline, cortisol) to keep going. That works in the short term but leaves you wired, tired and inflamed. Symptoms that seem unrelated usually trace back to a few upstream causes. Our job is to find those causes and remove them.

How this applies to you. Two main problems are feeding each other:

1. **Obstructive sleep apnea that was diagnosed but never treated.** With an AHI (apnea-hypopnea index) of 17.1, your airway partly collapses about once every three and a half minutes, every night. Each event ends with an adrenaline surge.
2. **A gut ecosystem damaged after the antibiotics.** It is producing methane at the maximum level the breath test can measure, fermenting protein into ammonia, and carrying persistent Pseudomonas and a leaky gut lining.

We want to be clear on one point in particular. **Your brain fog, low testosterone, low libido, irritability and weight gain are most likely downstream of these two problems, mainly the gut inflammation and endotoxin coming through a leaky barrier.** Endotoxin (LPS) is a fragment of bacterial cell walls. Once it crosses a leaky gut lining, it directly suppresses mitochondrial energy production, testosterone synthesis in the testes, and brain function. So we don't treat each symptom separately. We fix the airway and the gut, and the rest should follow.

How the plan is sequenced

PHASE	WEEKS	FOCUS
1	0 to 4	Collect stool sample; fix airway mechanics; remove fermentation fuel and gluten; foundational supplements
2	5 to 8	Rotating antimicrobials with biofilm disruption and a properly timed prokinetic; decision point at week 8
3	9 to 14	Rebuild the microbiome and gut lining; gluten retest around day 60; mitochondrial support only if needed at week 12
4	12 onward	Full bloodwork recheck on one lab platform, then hormone decisions

ASSESSMENT FINDINGS

Previous Diagnostics

Here is your previous information viewed through a new lens:

TSH (Sept 2026) Prism range <1.5 uIU/mL		**2.92 mIU/L** 1.9x above range

WHAT THIS MEANS FOR YOU

Your TSH has stayed at 2.88, 3.00 and 2.92 across four months. Free T3 (3.8) and free T4 (1.5) are in range, and both thyroid antibody tests are negative. So your thyroid gland is making hormone, but the brain is pushing harder than it should to keep things running. That fits a pattern where the hormone reaches your cells but the cells can't use it well. We explain this in "Cellular Hypothyroidism" below.

Free testosterone, equilibrium dialysis (Sept 2026) Prism range 100-240 pg/mL		**73.6 pg/mL** Below range
DHEA-S (Sept 2026) Prism range 250-600 mcg/dL (M)		**123 mcg/dL** Below range
Estradiol, immunoassay (Sept 2026) Prism range 10-30 pg/mL (men)		**36 pg/mL** Above range
Prolactin (Sept 2026) Prism range <10 ng/mL		**10.4 ng/mL** Above range

WHAT THIS MEANS FOR YOU

Your body started making testosterone again on its own after you stopped TRT, which is good news. Total testosterone is 455 to 465, and LH (3.1) and FSH (6.0) are normal. That is a recovered system, not a shut-down one. Still, a free testosterone of 73.6 is normal but not good. Most men don't notice a real change in energy, drive or body composition until free testosterone reaches roughly 100 to 110 or higher, so there is real room to improve. Low DHEA-S points the same way: your body is not investing much in steroid hormone production. The estradiol number comes from an immunoassay, which is unreliable at male levels, so we will retest it with LC-MS/MS.

Ferritin (Quest, Sept 2026) Prism range 50-150 ng/mL		**35 ng/mL** Below range
MCHC (Labcorp, Sept 2026) Prism range 33-35 g/dL		**31.8 g/dL** Below range
MCH (Labcorp, Sept 2026) Prism range 28.5-31.5 pg		**27.7 pg** Below range
RDW (Labcorp, July 2026) Prism range 12-14%		**14.4%** Above range
TIBC (May 2026) Prism range 293-381 mcg/dL		**387 mcg/dL** Above range
RBC (Labcorp, July 2026) Prism range 4.60-5.40 million/uL		**5.50 million/uL** Above range
Hematocrit (Labcorp, July 2026) Prism range 41.375-47.125% (male)		**48.4%** Above range

WHAT THIS MEANS FOR YOU

Ferritin (stored iron) swings because of the lab, not your body. Labcorp reads you at about 64 and Quest at about 35, in the same weeks, and once only hours apart. The red cell measures agree regardless of which lab you believe. Your red cells are small and carry little hemoglobin (low MCH and MCHC on every draw), cell size is getting more uneven (RDW rising), and reticulocytes (new red cells) are not rising to compensate. This is early iron-limited red cell production. Your red cell count and hematocrit run slightly high at the same time, which fits the low nighttime oxygen of untreated sleep apnea: the body makes more, smaller red cells to carry more oxygen.

Platelet count (Labcorp, Sept 2026) Prism range 205-335 thousand / uL		**178 thousand/uL** Below range
MPV (Quest, Sept 2026) Prism range 8.75-11.25 fL		**12.9 fL** Above range

WHAT THIS MEANS FOR YOU

Your platelet count has dropped steadily from 216 to 178 over four months. MPV (mean platelet volume) has been high on every test, which means your platelets are larger and younger than usual. Together these suggest your body is using up and replacing platelets faster than normal. This is not alarming, but we want to recheck it rather than ignore it.

White blood cells (Labcorp, Sept 2026) Prism range 5.3-9.0 x10e3/uL		**4.5 x10e3/uL** Below range
Absolute neutrophils (Labcorp, Sept 2026) Prism range 3075-6225 cells/uL		**2300 cells/uL** Below range
Absolute eosinophils (Quest, Sept 2026) Prism range 136.25-378.75 cells/uL		**78 cells/uL** Below range
Absolute basophils (Quest, Sept 2026) Prism range 50-150 cells/uL		**39 cells/uL** Below range

WHAT THIS MEANS FOR YOU

White blood cells have been low-normal on every draw. Making immune cells takes a lot of energy, and a low count often goes with a low metabolic rate. Your globulin also fell from 2.4 to 2.1 while your gut's secretory IgA was at its maximum. Together, that suggests your immune resources are being spent heavily at the gut lining.

Fasting insulin (Sept 2026) Prism range <5 uIU/mL		**6.0 uIU/mL** Above range
Fasting glucose (Sept 2026) Prism range 70-90 mg/dL		**91 mg/dL** Above range
hs-CRP (July 2026) Prism range <1 mg/L		**1.3 mg/L** 1.3x above range

WHAT THIS MEANS FOR YOU

Insulin is only slightly high (8.4 in July, 6.0 in September). Endotoxin from the gut and fragmented sleep both reduce insulin sensitivity. Your hs-CRP, a marker of inflammation, fell below 1 in September, so this is not a highly inflamed system. It is a leaky, energy-drained one.

Vitamin D, 25-OH (Sept 2026) Prism range 40-90 ng/mL		**29 ng/mL** Below range

WHAT THIS MEANS FOR YOU

Vitamin D has run 29 to 34 on four draws and is drifting down. Vitamin D dissolves in fat, so at your size it gets stored away and diluted, and your outdoor time is mostly in the evening when UVB is low. Your parathyroid hormone (PTH) is 25, which means your body is not yet compensating for the shortfall.

Breath methane, lactulose (May 2025) Prism range <10 ppm (standard lab cutoff; no Prism range)		**>81 ppm at every timepoint** 8x above range
Breath hydrogen rise (May 2025) Prism range <20 ppm rise (standard lab cutoff; no Prism range)		**2 ppm** In range

WHAT THIS MEANS FOR YOU

Methane was already at the test's upper limit before you drank the test sugar, and it stayed there for all six samples. That means a very large population of methane-producing microbes. We explain what this does in "Methane Overgrowth" below.

Secretory IgA, GI-MAP (June 2023) Prism range 510-2010 ug/g (lab reference; no Prism range)		**>6000 ug/g** 3x above range
Anti-gliadin IgA, stool (June 2023) Prism range <175 U/L (lab reference; no Prism range)		**>500 U/L** 3x above range
Zonulin, stool (June 2023) Prism range <175 ng/g (lab reference; no Prism range)		**209.3 ng/g** Above range
Pseudomonas spp. (June 2023) Prism range <1.00e4 (lab reference; no Prism range)		**2.76e4** 3x above range
P. aeruginosa (June 2023) Prism range <5.00e2 (lab reference; no Prism range)		**1.69e3** 3x above range
Beta-glucuronidase (June 2023) Prism range <1600 U/mL (lab reference; no Prism range)		**1678 U/mL** Above range

WHAT THIS MEANS FOR YOU

Secretory IgA is the antibody your gut lining uses to defend itself, and yours was three times the upper limit. Anti-gliadin IgA shows a strong immune reaction to gluten, and zonulin shows the lining is leaky. Calprotectin (19) and the blood test (FIT 0) were normal, which is why the gut wall looked "fine" on conventional workups. It isn't inflamed. It is permeable. Two years after the ciprofloxacin, Pseudomonas was still present. These results predate your herbal round, so they show the shape of the problem rather than its current size.

Akkermansia, Tiny Health (Apr and Oct 2025) Prism range >1% (general reference; no Prism range)		**0.000%** Below range
Enterobacteriaceae, Tiny Health (Apr 2025) Prism range <1% (general reference; no Prism range)		**11.74%** 12x above range
Ammonia production capacity (Apr 2025) Lower is better (no Prism range)		**3022 rpkm**
Hexa-LPS index (Apr 2025) Lower is better (no Prism range)		**13.36**

WHAT THIS MEANS FOR YOU

Akkermansia, a key microbe that maintains the protective mucus layer, was absent before and after treatment. In April 2025, E. coli-type bacteria made up more than 11% of your gut. These bacteria produce the most inflammatory form of endotoxin. Your community was also set up to break down protein into ammonia, which is toxic to mitochondria and nerves. P. aeruginosa still showed up at 0.194%, four years after the ciprofloxacin. The October retest improved the summary score (38 to 76), but your symptoms did not follow, and Akkermansia stayed at zero.

01 Obstructive Sleep Apnea: The Anchor

WHAT YOU REPORTED

You wake during the night	5/5
Unrefreshing sleep	4/5
not dreaming	2/5
afternoon crash	4/5
Acid reflux	5/5

Sleep study about 2 years ago: AHI 17.1 (moderate). CPAP failed across multiple masks, and nothing has been done since

Morning erections absent 5/5 even though daily tadalafil works on demand

positional, at night, when lying down

Urination 9, 8, 9, 8 times a day (average 8.5; frequent), plus waking at night to urinate

BMI 33.6, with about 40 lb gained, much of it likely since the sleep study; late-afternoon sweet cravings

WHAT THE TESTS SHOW

both early and late; you wake to urinate; you wake hot and sweaty despite a mattress cover at 62°F

Deviated septum (about 80-20), mouth breathing, large tonsils with tonsil stones, and an enlarged tongue with scalloped edges crowding the back of the throat on all four photos

BIOENERGETIC IMPLICATION

This one finding explains almost every nighttime symptom you have. When your airway collapses, you try to breathe against a closed throat, which creates strong suction inside your chest. That suction stretches the heart, which releases atrial natriuretic peptide, a hormone that tells the kidneys to dump salt and water. That is your nighttime urination. Each event ends with an adrenaline surge that briefly wakes the brain. That is the warm flush, and the fact that it happens on a 62°F cover shows the heat comes from inside you. The repeated wake-ups break up deep sleep and REM sleep, which explains the tossing and turning, the missing dreams and the afternoon crash. Nighttime erections depend on REM sleep. Tadalafil works for you on demand, which rules out a blood-flow problem, so erections that never appear overnight point to broken sleep rather than to testosterone. Poor sleep also lowers leptin (the "I'm full" hormone) and raises ghrelin (the hunger hormone), which fits the gradual weight gain and the sweet cravings. The same chest suction also pulls stomach contents upward, which is why your reflux happens only when you lie down.

Your airway is blocked at three levels: the nose (septum), the throat (tonsils) and the base of the tongue. Excess weight adds to all three. Nasal blockage is also the most common reason people can't tolerate CPAP, and nobody fixed your nose before handing you a mask.

02 Methane Overgrowth That Keeps Itself Going

WHAT YOU REPORTED

Constipation	5/5
Flatulence	5/5
belching	3/5
symptoms 1 to 3 hours after meals	2/5

Breath methane >81 ppm at every timepoint, starting before the test sugar (cutoff 10); the hydrogen-to-methane pathway is dominant

Bristol stool types 1-2, 2-3, 5, 2 (mostly hard); one bowel movement a day with straining and incomplete emptying

bloating 3/5 that builds in the evening and lying in bed; heavy gas on waking

Thick white-to-yellow coating on the back of the tongue on all four mornings

Minor fecal staining on 2 of 4 days, mostly on looser-stool days

The prior herbal round (Allimax, Candibactin AR/BR, ginger, probiotics for 3 months) helped while you were on it, then symptoms came back

Chicory root inulin (a fiber that gut microbes ferment readily) at least twice daily (Koia shake, Kashi GO, IQ Bars), plus Metamucil

WHAT THE TESTS SHOW

M. smithii (the main methane-producing microbe) was 1.368% before treatment and 1.517% after

BIOENERGETIC IMPLICATION

Methane is not a harmless gas. It directly slows movement through the small intestine and colon. That makes it self-reinforcing: slower transit means more fermentation, which means more methane, which slows transit further. Your last treatment round was a real effort, but three things undercut it:

1. **The fuel was never removed.** You took in chicory inulin, a favorite food of these microbes, every morning and evening during the entire kill phase. That is the best single explanation for why the round helped and then relapsed.
2. **Biofilm was never addressed.** Pseudomonas builds a protective gel called biofilm, which shields microbes from antimicrobials.
3. **The ginger was taken at the wrong time.** Taken with your morning shake, it acted on a full stomach. Ginger works as a prokinetic (a motility stimulant) by boosting the migrating motor complex, the "cleaning wave" that sweeps the small intestine only when it is empty.

Your daily pattern fits all of this. The evening cereal ferments overnight in a slow gut. The cleaning wave pushes the trapped gas downward during the fasting hours, so it arrives by morning. Mouth breathing and snoring add swallowed air on top of the fermentation gas.

The occasional sulfur-smelling gas, together with a hydrogen sulfide index of 19, suggests sulfur-producing bacteria are using up leftover hydrogen. We note it, but it is not a main target yet. The fecal staining looks like overflow around hard retained stool plus an old hemorrhoid. We expect it to resolve as transit normalizes, and we will check on it at week 4. Your foamy urine (4/5), with normal kidney tests (albumin-to-creatinine ratio 4, eGFR 112), should track with the gut work rather than need its own workup.

03 Leaky Gut Barrier and an Overworked Gut Immune System

WHAT YOU REPORTED

Skin issues 3/5

mucus buildup 2/5

dental issues 2/5

Secretory IgA >6000 (3x the upper limit); anti-gliadin IgA >500 with negative celiac tests; zonulin 209

Gluten daily (sourdough, Kashi, pizza, protein pancakes, granola)

a deep central tongue fissure with shifting bare patches

WHAT THE TESTS SHOW

Calprotectin 19, FIT 0: permeable, not inflamed

Akkermansia 0.000%, Bifidobacterium 0.010%, high mucus-degradation index (20.65): the protective mucus layer is being lost from both sides

BIOENERGETIC IMPLICATION

Gliadin, a protein in gluten, binds to receptors on the gut lining and triggers zonulin release, which opens the junctions between cells. You eat gluten at breakfast and dinner every day. Meanwhile, microbes that eat the mucus layer are thriving and the ones that build it (Akkermansia, Bifidobacterium) are missing. The result is a steady flow of food proteins and bacterial endotoxin through the gut wall. The endotoxin is what matters most for how you feel. It reaches the liver, brain, testes and muscle and slows mitochondrial energy production in each.

04 Persistent Pseudomonas and Cellular Hypothyroidism

WHAT YOU REPORTED

Puffiness	5/5
constipation	5/5
dry skin	3/5
brain fog	5/5

July 2021: Pseudomonas skin infection treated with ciprofloxacin; your decline starts here

Ammonia production 3022 rpkm; hexa-LPS index 13.36

WHAT THE TESTS SHOW

Stool Pseudomonas spp. 2.76e4 and P. aeruginosa 1.69e3 in 2023; P. aeruginosa 0.194% in 2025

Waking temperature 97.5, 97.7, 97.6, 97.6°F (average 97.6; below 97.8), measured correctly, though on a cooled mattress

Resting pulse 72, 71, 72, 70 (average 71; bottom of the 70-90 range)

Free T3 3.8, free T4 1.5, TSH about 3.0, antibodies negative

BIOENERGETIC IMPLICATION

Pseudomonas naturally resists ciprofloxacin, because it can pump the drug out. In the gut, the ciprofloxacin course likely cleared its competitors and let it take hold. P. aeruginosa releases pyocyanin, a blue pigment that interferes with the mitochondrial energy chain. It generates damaging free radicals and drains NADH, a key fuel molecule for making energy. Add ammonia from protein fermentation and endotoxin from gram-negative bacteria, and you have three known mitochondrial blockers in your data. Ciprofloxacin itself is a possible fourth: it can inhibit the enzymes that copy mitochondrial DNA. The mechanism makes sense, although human data are limited.

This is why your temperature and pulse are low even though thyroid hormone is present. **You don't need more thyroid hormone. You need your cells to be able to use what is already there.** Starting T3 now would give a short-term lift and hide whether the airway and gut work is doing anything, so we are deliberately holding off.

05 Brain Fog, Mood and Hormones Are Downstream Effects

WHAT YOU REPORTED

Brain fog	5/5
irritability	5/5
feeling jittery or on edge	5/5
loss of pleasure with no history of mental health issues	3/5
Low libido	3/5

On TRT you slept better, had better bowel movements, had morning erections and weighed 250 lb

Prior TRT: 200 to 250 mg as a single weekly injection caused high-estrogen effects; pellets caused a rash at the implant sites

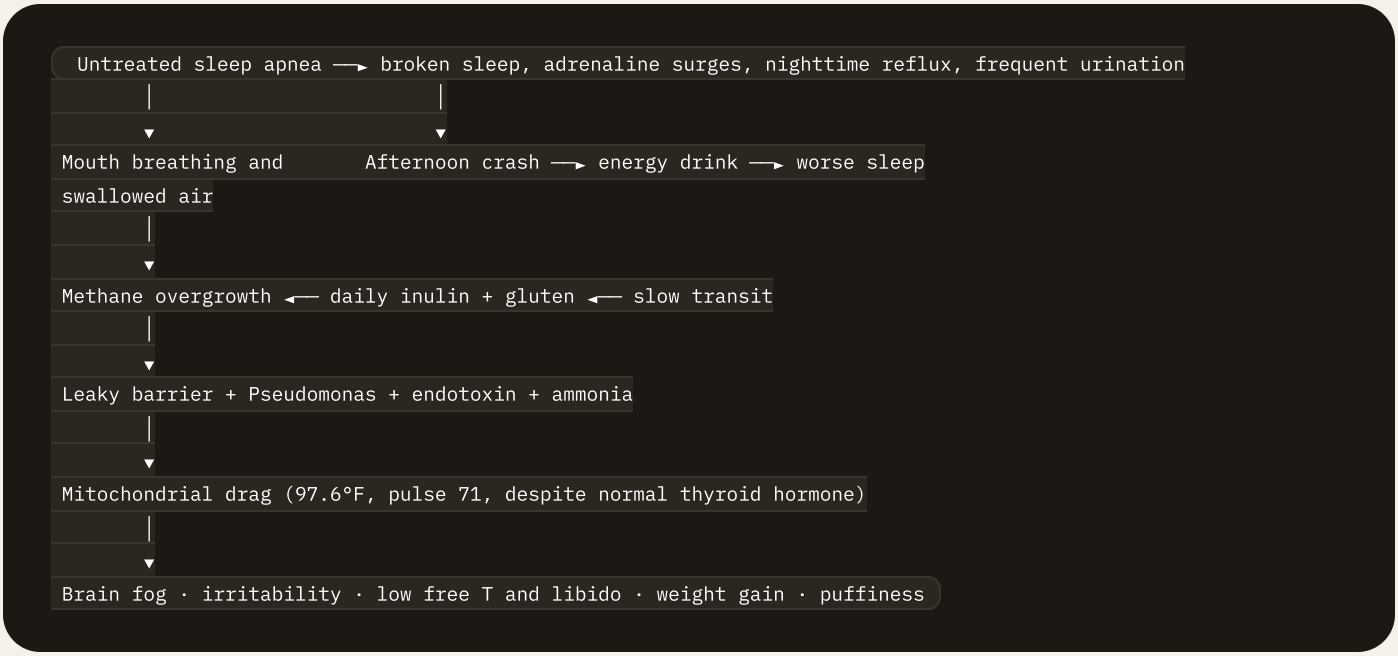
Beta-glucuronidase 1678 with one hard bowel movement a day

WHAT THE TESTS SHOW

free testosterone 73.6; DHEA-S 123

BIOENERGETIC IMPLICATION

Endotoxin directly lowers testosterone production in the testes, and it inflames the brain, which shows up as fog, irritability and flattened mood. Nightly adrenaline surges keep you on edge during the day. Your earlier bad reaction to testosterone came from the dosing: a large single weekly injection causes a spike that converts to estrogen. It was not a problem with testosterone itself. Slow stool transit plus high beta-glucuronidase (a bacterial enzyme that re-releases estrogen the liver has already processed for removal) keeps more estrogen circulating. Fat tissue also converts testosterone to estrogen. That is why we fix the airway and gut first, then recheck hormones with accurate tests before deciding on hormone therapy.


Untreated sleep apnea → broken sleep, adrenaline surges, nighttime reflux, frequent urination
Mouth breathing and swallowed air
Afternoon crash → energy drink → worse sleep
Methane overgrowth ← daily inulin + gluten ← slow transit
Leaky barrier + Pseudomonas + endotoxin + ammonia
Mitochondrial drag (97.6°F, pulse 71, despite normal thyroid hormone)
Brain fog · irritability · low free T and libido · weight gain · puffiness

06 Iron, Vitamin D and Daily Habits That Keep the Cycle Going

WHAT YOU REPORTED

Red cell measures show iron-limited red cell production (see Previous Diagnostics); red meat was historically low

Caffeine: black tea plus an energy drink at lunch (about 200 to 300 mg), plus pre-workout on training days

Fluids: 100 to 132 oz of purified water daily, no added salt; urine specific gravity 1.012 (dilute)

Protein about 194 g a day, with a gut community set up to ferment protein

WHAT THE TESTS SHOW

Vitamin D 29 to 34 and falling

BIOENERGETIC IMPLICATION

Caffeine at lunch creates a closed loop: apnea breaks up sleep, broken sleep causes the afternoon crash, the energy drink covers the crash, and the caffeine breaks up sleep further. Large amounts of low-mineral water with no salt make the nighttime urination worse and put extra load on the stress system. Your protein intake is appropriate for your size, but with this gut community it helps to keep it in a defined range rather than push it higher.

07 Watch Items

WHAT YOU REPORTED

Lower-body and groin sweating was present before 2021 and is worse now. The most likely explanation is ordinary: skin-on-skin friction and trapped moisture at your current weight. The location is worth noticing, though. Your 2021 infection started on the inner thigh, and warm, moist, trapped skin is exactly where an opportunistic organism like Pseudomonas gets established. The sweating may have set the stage for that infection, which also means it could happen again. **Please let your advisor know:** Is there any rash, redness, itching or odor in the area? Is it on both sides? Are your palms, soles or armpits involved? Also, how many Candibactin AR and BR capsules did you take per dose during your prior round?

Possible motility damage from food poisoning about a year ago, with three weeks of post-meal problems afterward. Bacterial food poisoning can trigger antibodies that damage the gut's motility nerves. It came after your methane overgrowth was documented, so at most it would be a second hit, and it adds to the case for timing the prokinetic properly.

Closed: H. pylori (two independent negative tests) and mold (your symptoms didn't change at all on vacation away from home and work, and the earlier exposure ended when you moved).

Precision Diagnostics

Symptoms tell us where to look. Objective numbers tell us whether the plan is working. Your history shows why consistency matters: your ferritin reads nearly double at Labcorp compared with Quest. **From here on, we compare results only within one lab. Choose Labcorp for all blood draws and stay with it.**

Genova GI Effects Fundamentals (already ordered)

PROVIDER
Genova Diagnostics (kit in hand)

Collect this sample before any antimicrobial starts, ideally this week.

Collecting after Microcidin or Atrantil begins would measure the treatment instead of your baseline. The culture section is the most useful part: if Pseudomonas or yeast grows, it comes with sensitivity data showing which botanicals work against it, and we can adjust the rotation to match. The Fundamentals panel does not include zonulin or anti-gliadin IgA, and probably not secretory IgA, so check the requisition when the kit arrives.

Full Spectrum Thyroid (TSH, free and total T3, free and total T4, reverse T3, antibodies)

PROVIDER
LTRL

This is the week 12 recheck. Reverse T3 is the new marker: it is an inactive form of T3 that rises with stress and inflammation and blocks active T3. If temperature and pulse have improved while TSH has dropped, the airway and gut work is getting through to your cells. If not, the mitochondrial support layer becomes more important.

Testosterone, Free (Dialysis) and Total MS, with SHBG, LH and FSH

Provider: LTRL

Estradiol, Ultrasensitive LC/MS/MS

Provider: LTRL

Prolactin, DHEA-S, IGF-1, AM Cortisol

Provider: LTRL

These results decide the hormone phase. Estradiol must be measured by LC-MS/MS, because immunoassays are unreliable at male levels. If free testosterone rises toward 100 once your sleep and gut improve, you may not need hormone therapy. If it doesn't, we will talk through properly dosed options with an accurate estrogen measurement in hand.

Comprehensive Iron Panel (ferritin, iron, TIBC, saturation)

Provider: LTRL

CBC with Differential and Platelets

Provider: LTRL

These show whether lactoferrin and liver are rebuilding iron, whether MCHC and RDW are normalizing, and whether the platelet decline has leveled off. If platelets keep falling while MPV stays high, we will look further.

Vitamin B12 with Methylmalonic Acid and Homocysteine

PROVIDER
LTRL

Your B12 is above 2000 even though you don't take B12. That can happen when B12 circulates in the blood but doesn't get into cells well. Methylmalonic acid and homocysteine rise when cells are actually short of B12, so they show whether your cells are getting it.

hs-CRP, CMP, Fasting Insulin, HbA1c

Provider: LTRL

Vitamin D 25-OH with PTH

Provider: LTRL

These track inflammation, liver and kidney function, and insulin sensitivity as your sleep and gut improve. Vitamin D on 5000 IU should reach at least 40. If it doesn't, absorption may also be a problem.

Anti-gliadin IgA and zonulin retest

PROVIDER
Local Provider

Collect this at the end of the 60-day gluten elimination, around mid Phase 3. The result decides whether gluten comes back or stays out long term.

G6PD Enzyme Activity

PROVIDER

LTRL

You need this only before starting methylene blue. In people with G6PD deficiency, methylene blue can cause red blood cells to break down, so this safety check is not optional.

ORDERING YOUR LABS

- **Discount Codes:** Enter TWO codes at checkout: `PrismNoFee` (removes interpretation fee) + `AnalyzeFirst10` (10% off first order) OR `ANALYZE` (5% off subsequent orders)
- **Draw Instructions:** Draw fasting (nothing with calories for 8 hours beforehand, water only, no coffee or caffeine), and book before 9 am at a Labcorp site. Avoid strenuous exercise beforehand, including Barry's the day before. Stop biotin supplements at least 3 days before (check any multivitamins). If you are ever on thyroid medication, take it 1 to 3 hours before the draw.

Diet & Lifestyle Recommendations

Airway First: Position Your Body for Open Breathing

Start tonight. **Raise the head of your bed 6 to 8 inches using risers under the bedposts, not pillows.** Pillows bend the neck forward and make the airway more likely to collapse. A raised bed lets gravity help keep both your airway and your stomach contents where they belong. **Sleep on your left side**, using a positional pillow or a wedge behind your back so you don't roll over. Left-side sleeping is better than right-side for nighttime reflux because of how the stomach sits in the body. It also reduces airway collapse compared with sleeping on your back.

Open the Nose

Rinse your nose with saline every night before bed. Then try an internal nasal dilator or an external nasal strip, and see which one you tolerate better. Your nose is the most likely reason CPAP failed, and it also contributes to your tonsil stones and the air you swallow at night. Keeping air moving through the nose helps your sleep, your reflux and your gas.

Get Your Sleep Study Report and Go Back to Your Doctors with Specific Questions

Please request the full report from your original sleep study and send it to your advisor. We need the AHI broken down by sleeping position and by sleep stage, your lowest oxygen level, the ODI (oxygen desaturation index, how often your oxygen dropped), and how many events were obstructive versus central. The breakdown by position tells us how much to expect from positional therapy alone.

Then bring two specific questions to your doctors:

1. **To ENT:** "Am I a candidate for septoplasty with inferior turbinate reduction? And is a tonsillectomy indicated, given large tonsils plus recurring tonsil stones in a man with moderate apnea who can't tolerate CPAP?"
2. **To your PCP or ENT:** "Can I have a sleep medicine referral to look at alternatives to CPAP, specifically a custom mandibular advancement device?" This is a mouthpiece that holds the lower jaw forward to keep the airway open. It is a legitimate option at an AHI of 17 and is generally easier to tolerate than CPAP.

Remove the Fermentation Fuel

This is the most important dietary change in your plan, and it costs nothing. **Remove everything that contains chicory root inulin: the Koia shake, the Kashi GO cereal and the IQ Bars.** Also stop Metamucil, since psyllium adds fermentable bulk to a system that can't move it along. Take the Trader Joe's Omega Trek Mix out, because it is also a concentrated source of polyunsaturated fats (PUFAs). Take the Lean Cuisine pizza out of your dinners.

Easy swaps:

INSTEAD OF	TRY
Koia shake or protein waffle	Eggs, Greek yogurt or cottage cheese with fruit and honey
Trail mix snack	Fruit, cheese, Fage yogurt, or homemade gelatin gummies
Cereal or frozen pizza at dinner	Ground beef, salmon or chicken + cooked green beans or carrots + potatoes or white rice

These processed foods stay out for good, whatever your gluten retest shows. There's no reason to bring them back.

Strict Gluten Elimination for 60 Days

Your anti-gliadin IgA of more than 500 and zonulin of 209 show that gluten is opening your gut barrier every day. Remove all wheat, barley and rye for 60 days, including sourdough, granola, protein pancakes, and any sauces or seasonings that contain wheat. Well-cooked white rice, potatoes, fruit and root vegetables replace them easily. Around day 60 we retest anti-gliadin IgA and zonulin, and that result, rather than a trial-and-error reintroduction, decides what happens next.

Build Meals for Motility and Energy

- **Calories:** Keep eating enough. Your current intake is not the problem, and cutting back would raise stress hormones and suppress your thyroid further.
- **Protein:** 160 to 200 g a day. Treat 160 as the floor and 200 as the ceiling. This protects muscle while limiting the leftover protein your gut community ferments into ammonia. Prioritize red meat, eggs, dairy and seafood.
- **Carbohydrates:** Shift some calories toward carbohydrates your cells burn easily (fruit, root vegetables, honey, dairy), with more at midday than in the evening. Carbohydrates lower stress hormones and support conversion of T4 to active T3.
- **Meal spacing:** Leave 3 to 4 hours between meals, with no grazing, so the gut's cleaning wave can run. Your 6 pm cutoff before a 5 am wake-up is already a good overnight fast. Drop the occasional bedtime protein shake. Your reflux is mechanical, not caused by meal timing.
- **Fats:** Minimize PUFAs from seed oils (soybean, canola, sunflower, safflower and similar) and from nut-heavy snacks. PUFAs slow metabolic rate, feed inflammatory signaling and are linked to lower androgens. Cook with butter, tallow, coconut oil or olive oil. Your shift toward more red meat is a good one, because ruminant fat is naturally low in PUFAs.
- **Additives:** Avoid gums, carrageenan, added fibers such as chicory, synthetic dyes and flour fortified with iron. Check your pre-workout and protein isolate labels for these too.

All Caffeine Before Noon

Keep your morning black tea. **Drop the lunchtime energy drink**, and use pre-workout only if you train before noon. That breaks the loop of crash, then caffeine, then worse sleep. As your airway and gut improve, the afternoon crash should ease on its own.

Rebalance Fluids and Sodium

Cut total fluids to about 80 to 100 oz a day, with most of it before 4 pm. **Salt your food to taste.** Restricting salt activates your adrenaline and stress hormone systems, and adding salt improves insulin sensitivity and supports stomach acid production. Add a morning electrolyte drink with sodium, potassium and magnesium (see Supplements). Less plain water and more minerals should noticeably reduce your daytime and nighttime urination.

Bowel Movement Mechanics

Give yourself an unhurried time slot each morning after a warm drink. Keep your knees above your hips (you already use a footstool, which is great), breathe out gently, and don't hold your breath or strain.

Light, Sleep Timing and Grounding

- **Keep consistent wake and sleep times**, anchored to your 5 am start. A regular rhythm supports gut motility, thyroid output and a normal cortisol pattern.
- **Get morning light.** Your outdoor time is mostly after work. Add 10 to 20 minutes of daylight soon after waking, even through clouds, without sunglasses. Midday sun on weekends (without burning) is your best free vitamin D source. Bright daytime light lowers cortisol and supports thyroid function.
- **Cut blue light at night.** Dim the lights after sunset and use blue-light-blocking glasses if you're on screens. Evening blue light suppresses melatonin and keeps stress hormones up.
- **Ground.** Take your shoes off for part of your trail walks or Sunday hikes, on grass or soil, for 20 minutes or more. Grounding reduces sympathetic (fight-or-flight) activity, inflammation and cortisol.

Track Temperature and Pulse Twice Daily

Measure temperature and pulse on waking (before getting up or eating) and again mid-afternoon (before food or caffeine). The difference between the two tells us a lot. A low morning reading that jumps sharply by 3 pm points to a pattern propped up by adrenaline, which would shift us toward more feeding and stabilizing. On two or three mornings, turn off the mattress cooling to get a clean baseline. This is only to get an accurate measurement. We are not asking you to change how you sleep.

Supplement Recommendations

PHASE 1:

Start Now (continue through week 4 and beyond as noted)

ITEMS 1 TO 9 OF 23

Grass-Fed Lactoferrin

Provider: LifeGivingStore, use code "Optimize" at checkout for 10% off

DOSAGE AND TIMING

250 mg twice daily (about 4 scoops per dose), continued through Phase 2.

NOTES

Lactoferrin is an iron-binding protein from milk. It does three jobs here. It delivers iron to your red cells without leaving free iron in your gut, where the E. coli-type bacteria and Pseudomonas would use it. It weakens bacterial biofilm. And it supports your gut's immune layer. Together with liver, it is your iron plan. Keep the Optiferin iron pills on the shelf for now.

N-Acetylcysteine

Provider: PureBulk, use code "PRISM" at checkout for 10% off

DOSAGE AND TIMING

600 mg twice daily. Start now and continue through the whole antimicrobial phase.

NOTES

NAC (N-acetylcysteine) breaks down the gel matrix that biofilm-forming organisms like Pseudomonas hide behind, so the antimicrobials can reach them. It also supplies the building blocks for glutathione, your main internal antioxidant, which helps you handle die-off. Biofilm coverage is the piece missing from every earlier attempt.

Vitamin D3

Provider: Health Natura, use code "PRISM111" at checkout for 20% off

Vitamin K2 (MK-7)

Provider: Health Natura, use code "PRISM111" at checkout for 20% off

DOSAGE AND TIMING

5000 IU of D3 daily, plus 2 drops of K2, both with your largest fat-containing meal. You can use the vitamin D drops you already own if they give 5000 IU per serving.

NOTES

Vitamin D lowers stress hormone output, supports the gut barrier and immune defense, helps convert T4 to active T3, and supports testosterone production. K2 directs the extra calcium you absorb into bone rather than blood vessels. We will recheck your level at week 12.

Magnesium bicarbonate

Provider: PristineHydro

DOSAGE AND TIMING

Keep your magnesium glycinate at bedtime and add this to reach about 400 mg of magnesium total at night. Take 1 to 2 oz of the solution before bed.

NOTES

Glycinate calms the nervous system and helps you fall asleep, but it does little for the bowel. An osmotic form of magnesium draws water into the stool, which helps soften the hard, broken-up stools caused by slow, methane-driven transit. The bicarbonate may also ease nighttime heartburn.

Grass-Fed Beef Gelatin

Provider: Great Lakes Wellness

DOSAGE AND TIMING

10 to 20 g daily (about 1 to 1.5 tablespoons). Dissolve it in warm drinks or broth, or make gummies with juice.

NOTES

Gelatin is rich in glycine and proline, which calm inflammation in the gut lining and supply building material for barrier repair. Homemade juice gummies also make a good replacement for the trail mix snack.

Zinc Carnosine

Provider: Pure Encapsulations

DOSAGE AND TIMING

75 mg twice daily with meals. Check the amount per capsule on the label.

NOTES

Zinc carnosine sticks to damaged areas of the stomach and intestinal lining, tightens the junctions between cells, and increases protective mucus. That helps both the leaky barrier and your reflux-irritated upper GI tract.

Grass Fed Beef Liver

Provider: Ancestral Supplements

DOSAGE AND TIMING

3 to 4 oz of fresh beef liver a week. If you won't eat it, take 6 capsules daily, which works out to roughly 3 oz of fresh liver a week. Keep eating red meat regularly.

NOTES

Liver provides heme iron (the form your body absorbs best), copper and retinol, all of which your body needs to use iron and build hemoglobin. Retinol also supports thyroid hormone action. Combined with lactoferrin, it should lift your MCHC and ferritin without free iron feeding gut bacteria.

RefluxRaft (alginate)

Provider: RefluxRaft

DOSAGE AND TIMING

One dose after your evening meal and another at bedtime. It replaces the Tums.

NOTES

Alginate comes from seaweed. It reacts with stomach acid to form a floating gel "raft" that physically blocks reflux, which makes it the best available option for reflux when lying down. It does this without suppressing acid, which addresses your concern about Nexium. This is a bridge, not a treatment. It manages the symptom while the airway and gut work removes the causes, and you stop it once they are fixed.

Sport Drink

Provider: Sport Drink

DOSAGE AND TIMING

1 tablespoon dissolved in water each morning.

NOTES

This gives you sodium, potassium and magnesium without additives. It helps you hold on to the water you drink rather than passing it straight through, and supports the goal of fewer daytime and nighttime trips to the bathroom.

PHASE 2:

Antimicrobial Rotation with Biofilm Coverage (Weeks 5 to 8)

ITEMS 10 TO 14 OF 23

Start only after your GI Effects stool sample has been collected and shipped. Keep lactoferrin, NAC, gluten elimination and the low-fermentation diet going throughout. If your GI Effects culture shows Pseudomonas or significant yeast along with botanical sensitivity data, we will adjust the rotation to match.

Microcidin (Vita Aid)

Provider: Charny Healing

DOSAGE AND TIMING

Week 5: 1 capsule daily, increasing to 1 capsule twice daily as tolerated. Week 7: 1 to 2 capsules twice daily.

NOTES

Microcidin combines berberine-rich coptis, standardized allicin from garlic, oregano (carvacrol), clove and caprylic acid. Each works against microbes through a different mechanism. The allicin in particular targets methane-producing microbes.

Microcidin AF (Vita Aid)

Provider: Charny Healing

DOSAGE AND TIMING

Week 6: 1 capsule daily, increasing to twice daily as tolerated. Week 8: 1 to 2 capsules twice daily.

NOTES

This garlic-free version provides 500 mg of berberine per 2 capsules, plus thyme, cinnamon, oregano, neem and uva ursi. Neem and uva ursi also have anti-biofilm activity. Switching between the two formulas each week hits the microbial community from different angles and makes it harder for any one population to adapt.

Atrantil

Provider: KBMD Health

DOSAGE AND TIMING

Take as directed on the label. The published studies used 2 capsules three times daily for 2 to 4 weeks. Ask your advisor before implementing this, this serves as a backup antimicrobial option.

NOTES

Atrantil combines quebracho (tannins that soak up the hydrogen methane-producers need), horse chestnut (saponins that stimulate motility and reduce methane production) and peppermint. A small placebo-controlled trial found significant improvements in constipation and bloating in people with constipation-predominant IBS. A pilot study in people with methane overgrowth found meaningful relief of bloating and abdominal pain. It fits your constipation-driven methane pattern directly.

Pure Encapsulations Ginger Extract

Provider: Pure Encapsulations

DOSAGE AND TIMING

1 capsule (500 mg) on an empty stomach twice daily, plus 1 at bedtime. Allow at least 2 to 3 hours after food.

NOTES

Ginger speeds stomach emptying and strengthens the gut's cleaning wave, but only when the gut is empty. That is why it did little alongside your morning shake. Taking it at bedtime lines it up with your long overnight fast, which is exactly when trapped gas and bacteria need to be swept out.

Allimax Pro (already owned)

Provider: Allimax

DOSAGE AND TIMING

Only if there is no meaningful improvement at the week 8 decision point. Then take 450 mg (1 capsule) three times daily for at least 4 weeks, added on top of the Microcidin AF weeks rather than replacing them.

NOTES

Microcidin AF already provides the berberine, thyme, cinnamon, oregano and neem base. What you would be adding is a concentrated dose of allicin, the compound best studied against methane-producing microbes. Your earlier round used a lower dose, with no fuel removal and no biofilm coverage, so this would be a very different intervention.

Week 8 decision point

We will review bowel frequency, Bristol stool type, evening bloating, morning gas volume, reflux frequency, and your temperature and pulse log. If there is meaningful improvement, you continue rotating Microcidin and Microcidin AF for a second month and start rebuilding at the same time. If not, the Allimax Pro escalation begins.

PHASE 3:

Rebuild (Weeks 9 to 14)

ITEMS 15 TO 19 OF 23

Sunfiber (PHGG)

Provider: Tomorrow's Nutrition

DOSAGE AND TIMING

Week 9: 1/4 scoop daily with food. Week 10: 1/2 scoop. Weeks 11 to 14: 1 scoop daily.

NOTES

PHGG (partially hydrolyzed guar gum) ferments slowly and is low in FODMAPs (the short-chain carbohydrates that ferment quickly and cause gas). That makes it the right fiber to start after an overgrowth, unlike the inulin you removed. It softens stool and feeds butyrate-producing bacteria. In studies, it has improved constipation and made SIBO treatment more effective.

Tributyrin

Provider: DEVA

DOSAGE AND TIMING

1 capsule daily with food, increasing to twice daily as tolerated over the phase.

NOTES

Butyrate is the main fuel for the cells lining your colon, and it tightens the junctions between them. Tributyrin delivers butyrate directly while your own butyrate-producing bacteria recover.

MegaSporeBiotic

Provider: Microbiome Labs

DOSAGE AND TIMING

1 capsule every other day for the first week, then 1 to 2 daily.

NOTES

Spore-forming Bacillus strains survive stomach acid, crowd out opportunistic bacteria, and have been shown to reduce endotoxin passing into the blood after meals. That directly targets the endotoxin load we believe is behind your brain fog and low testosterone.

Pendulum Akkermansia

Provider: Pendulum

DOSAGE AND TIMING

1 capsule daily with food, starting at week 10 once transit and the antimicrobial phase have settled.

NOTES

Akkermansia maintains the mucus layer and has been linked to better insulin sensitivity and weight regulation. It was completely absent on both of your metagenomic tests, so it probably won't come back without direct replacement.

Pomegranate Extract

Provider: Bulk Supplements

DOSAGE AND TIMING

250 to 500 mg daily, started alongside the Pendulum.

NOTES

Pomegranate polyphenols (ellagitannins) are a preferred food for Akkermansia and help it establish itself. They also provide ongoing antioxidant support for the gut lining.

Mitochondrial Support Layer (Conditional, Week 12)

ITEMS 20 TO 23 OF 23

Add these **only if your temperature and pulse have not improved by week 12**. Introduce them one at a time, 4 to 5 days apart, so any reaction can be traced to a single product. This layer also covers the possibility that ciprofloxacin left lasting mitochondrial damage. If the gut and airway work does not move things enough, we will look at that more closely.

Ecological Formulas Allithiamine (TTFD) 50 mg

Provider: PureFormulas

DOSAGE AND TIMING

1 capsule daily with food. After 4 to 5 days, increase to 1 capsule twice daily and stay there.

NOTES

Thiamine (vitamin B1) is required to turn carbohydrate into energy rather than lactic acid. The TTFD form enters cells without needing the usual thiamine transporter. That matters for you, because a protein-fermenting gut and past antibiotic use can both impair how you handle thiamine.

Jarrow Formulas Ubiquinol QH-Absorb 200 mg

Provider: Jarrow Formulas

DOSAGE AND TIMING

1 softgel daily with your largest fat-containing meal, starting 4 to 5 days after the thiamine.

NOTES

Ubiquinol is the active form of CoQ10, which carries electrons along the mitochondrial energy chain at exactly the points that pyocyanin disrupts. It also works as an antioxidant inside mitochondria.

Jarrow Formulas Acetyl-L-Carnitine 500 mg

Provider: Jarrow Formulas

DOSAGE AND TIMING

Start 4 to 5 days after the ubiquinol. Take 1 capsule daily for a week, then 1 capsule twice daily, on an empty stomach or between meals.

NOTES

Acetyl-L-carnitine moves fatty acids into mitochondria to be burned and supplies material for acetylcholine, a neurotransmitter involved in focus. It supports both energy production and mental clarity.

Methylene Blue (pharmaceutical grade, USP)

Provider: Health Natura, use code "PRISM111" at checkout for 20% off

DOSAGE AND TIMING

5 mg once in the morning. After a week, you may increase to 10 mg if it's well tolerated. Morning only, because it is alerting and can disrupt sleep. Check the per-drop concentration on your bottle (about 10 drops of a standard 0.5% solution equals 5 mg), and ask your advisor to confirm the drop count.

NOTES

Methylene blue can carry electrons around blocked points in the mitochondrial energy chain, which can restore energy output. **Two absolute safety screens before starting:** a normal G6PD test (see Diagnostics), and confirmation that you are not taking any serotonergic medication (SSRIs, SNRIs, MAOIs, tramadol), because methylene blue inhibits MAO (monoamine oxidase) and the combination can cause serotonin syndrome. Use pharmaceutical-grade USP only, never aquarium or industrial grade.

Conclusion

Everything in your case connects. Untreated sleep apnea breaks up your nights, floods you with adrenaline, drives reflux and nighttime urination, and blocks the REM sleep that nighttime erections depend on. A gut changed by the 2021 antibiotics is producing methane at the test's maximum, fermenting protein into ammonia, holding on to Pseudomonas behind biofilm, and leaking endotoxin through a barrier that daily gluten keeps opening. Those toxins slow your mitochondria, which is why your temperature and pulse are low despite normal thyroid hormone. **Your brain fog, irritability, low free testosterone, low libido and weight gain are downstream of that inflammation and endotoxin load, not separate problems each needing its own specialist.**

That is why the plan runs in this order. First we open the airway and remove the fuel. Then we clear the overgrowth while breaking down its biofilm. Then we rebuild the microbiome and the gut lining. Only then do we recheck your hormones with accurate tests on one lab platform. Your body is already telling us it can recover: your testosterone came back on its own, and your symptoms improved during the last treatment round. This time, the gaps that made the last round fail are closed.

⚠ SAFETY NOTES

Safety notes: Contact your Prism advisor right away if you notice a racing heart, severe die-off symptoms (significant fatigue, headache or worse gut symptoms that last more than a few days), a rash, dark urine, or any new symptom after starting a product. Don't start methylene blue without a normal G6PD result and confirmation that you take no serotonergic medications. Tell every prescriber about your tadalafil and any supplements before new medications are added. Please send us the answers about the groin sweating and your prior Candibactin dosing, and send your full sleep study report as soon as you have it. We are with you through each phase.

Scientific References

ASSESSMENT FINDINGS

OBSTRUCTIVE SLEEP APNEA AS A SYSTEMIC DRIVER

1 Nocturia and obstructive sleep apnoea | Nature Reviews Urology.

2 Sleep Apnea and Circadian Extracellular Fluid Change as Independent Factors for Nocturnal Polyuria.

3 The Impact of Sleep-Disordered Breathing on Ghrelin, Obestatin, and Leptin Profiles in Patients with Obesity or Overweight.

4 Sleep apnea syndrome associated with gonadal hormone imbalance (Review).

5 Hypogonadism in men with obstructive sleep apnea and its related risk factors.

6 Association Between Obstructive Sleep Apnea and Reflux Disease: A Systematic Review and Meta-Analysis.

METHANE OVERGROWTH AND SLOWED TRANSIT

7 Sarah Talamantes, Faye Steiner, Sean Paul Spencer, Leila Neshatian, Irene S. Sonu (2024-07-27T00:00:00.000Z). Intestinal Methanogen Overgrowth (IMO) Is Associated with Delayed Small Bowel and Colonic Transit Time (TT) on the Wireless Motility Capsule (WMC).

8 Jarongkorn Sirimongkolkasem, Briana Valencia, Laren S. Becker, Sean Paul Spencer, Irene S. Sonu, Linda Nguyen, et al. (2026-07-01T00:00:00.000Z). Methane Trajectory Phenotypes on Glucose Breath Testing Are Associated With Slow Colonic Transit: A Group-Based Trajectory Modeling Analysis.

9 Sepideh Mehravar, Jiajing Wang, Ali Ranjideh Rezaie, Mark Pimentel (2023-10-01T00:00:00.000Z). S666 Symptoms Linked to Intestinal Methanogen Overgrowth (IMO): A Systematic Review and Meta-Analysis.

10 Will Takakura, Mark Pimentel, Satish Rao, Maria Jesus Villanueva-Millan, Christine Chang, Walter Morales, et al. (2022-01-17T00:00:00.000Z). A Single Fasting Exhaled Methane Level Correlates With Fecal Methanogen Load, Clinical Symptoms and Accurately Detects Intestinal Methanogen Overgrowth.

11 Ihab Malat, Michel Drancourt, Ghiles Grine (2024-09-01T00:00:00.000Z). Methanobrevibacter smithii cell variants in human physiology and pathology: A review.

12 Muhammad Zarrar Khan, Ruishen Lyu, John P. McMichael, Scott L Gabbard (2022-01-10T00:00:00.000Z). Chronic Intestinal Pseudo-Obstruction Is Associated with Intestinal Methanogen Overgrowth.

PSEUDOMONAS, PYOCYANIN AND FLUOROQUINOLONE MITOCHONDRIAL EFFECTS

13 (2025-01-01T00:00:00.000Z). Effects of Pseudomonas aeruginosa pyocyanin and 1-hydroxyphenazine on intracellular calcium, mitochondrial function, and viability in human nasal epithelial cells | bioRxiv.

14 Richard D. Horak, John A. Ciemniecki, Dianne K. Newman (2024-11-12T00:00:00.000Z). Bioenergetic suppression by redox-active metabolites promotes antibiotic tolerance in Pseudomonas aeruginosa.

15 Anu Hangas, Koit Aasumets, Nina J Kekäläinen, Mika Paloheinä, Jaakko L. O. Pohjoismaki, Joachim Matthias Gerhold, et al. (2018-10-12T00:00:00.000Z). Ciprofloxacin impairs mitochondrial DNA replication initiation through inhibition of Topoisomerase 2.

16 Till Reinhardt, Nina C. Bach, Robin Alexander Rothemann, Adrian T. Jauch, Yassmine El Harraoui, Sigrid Maria Müller-Deubert, et al. (2024-10-21T00:00:00.000Z). Chemical proteomics reveal human off-targets of fluoroquinolone induced mitochondrial toxicity.

17 (2022-07-05T00:00:00.000Z). Mitochondrial dysfunction is underlying fluoroquinolone toxicity: an integrated mitochondrial toxicity assessment | Molecular & Cellular Toxicology | Springer Nature Link.

18 (2019-12-16T00:00:00.000Z). Universal antibiotic tolerance arising from antibiotic-triggered accumulation of pyocyanin in Pseudomonas aeruginosa | PLOS Biology.

GUT BARRIER, GLIADIN, ZONULIN AND ENDOTOXIN DOWNSTREAM EFFECTS

19 Maher Monir. Akl, Abdelrahman Ahya M. Ali, Ahmed Ali. El-Nagar, Amr Kamel Khalil Ahmed (2026-02-28T00:00:00.000Z). Immunopathophysiology of Gluten-Associated Insulin Resistance: A 33-mer Gliadin–CXCR3–Zonulin Axis Driving IRAK4-Centered Innate Immune Amplification, Sulfur Depletion, and Upstream Modulation by Aspergillus niger Prolyl Endopeptidase.

20 Sandro Drago, Ramzi El Asmar, Mariarosaria Di Pierro, Maria Grazia Clemente, Amit Tripathi, Anna Sapone, et al. (2016-09-23T00:00:00.000Z). ORIGINAL ARTICLE Gliadin, zonulin and gut permeability: Effects on celiac and non-celiac intestinal mucosa and intestinal cell lines.

21 Romina Monzani, Mara Gagliardi, Valentina Saverio, Nausicaa Clemente, Alice Monzani, Ivana Rabbone, et al. (2025-03-31T00:00:00.000Z). The CXCR3/PLC/IP3-IP3R axis is responsible for the ignition of UPR in intestinal epithelial cells exposed to gliadin peptide, during the onset of celiac disease.

22 (2019-09-13T00:00:00.000Z). The endotoxin hypothesis of neurodegeneration | Journal of Neuroinflammation | Springer Nature Link.

23 (2017-03-08T00:00:00.000Z). Metabolic endotoxaemia related inflammation is associated with hypogonadism in overweight men | Basic and Clinical Andrology | Springer Nature Link.

24 Apor Veres-Székely, Csenge Szász, Domonkos Pap, Beáta Szebeni, Péter Bokrossy, Ádám Vannay (2023-04-19T00:00:00.000Z). Zonulin as a Potential Therapeutic Target in Microbiota-Gut-Brain Axis Disorders: Encouraging Results and Emerging Questions.

DIET & LIFESTYLE RECOMMENDATIONS

POSITIONAL AND AIRWAY INTERVENTIONS

25 (2021-01-19T00:00:00.000Z). Head of bed elevation to relieve gastroesophageal reflux symptoms: a systematic review | BMC Primary Care | Springer Nature Link.

26 Daniel Martin Simadibrata, Elvira Lesmana, Bagus Ramasha Amangku, Muhammad Prasetio Wardoyo, Marcellus Simadibrata (2023-10-24T00:00:00.000Z). Left lateral decubitus sleeping position is associated with improved gastroesophageal reflux disease symptoms: A systematic review and meta-analysis.

27 Abdelrahman MA Mohamed, Omar Magdy Mohammed, Shanshan Liu, Maher Al-Balaa, Leena Ali Al-Warafi, Song Juan Peng, et al. (2024-06-07T00:00:00.000Z). Oral appliance therapy vs. positional therapy for managing positional obstructive sleep apnea; a systematic review and meta-analysis of randomized control trials.

28 Gianna Dipalma, Angelo Michele Inchingolo, Pasquale Avantario, Antonio Mancini, Merigrazia Campanelli, Daniela Di Venere, et al. (2025-09-08T00:00:00.000Z). Comparative Efficacy of Continuous Positive Airway Pressure and Mandibular Advancement Devices in the Treatment of Obstructive Sleep Apnea: A Systematic Review.

29 (2026-04-28T00:00:00.000Z). Frontiers | The role of nasal patency in obstructive sleep apnea: an expert consensus.

30 Hao Wu, Fang Fang, Yaxin Guo, Chan Wu, Yongxiang Wei (2021-12-14T00:00:00.000Z). Independent Role of Nasal Congestion in Positive Airway Pressure Compliance for OSA Treatment.

FERMENTABLE FIBER, CAFFEINE AND SALT

31 Pablo Eliasib Martínez-Gopar, Fabiola Guzmán-Mejía, Marycarmen Godínez-Victoria, Jesús Flores-Valente, Daniel Efrain Molotla-Torres, María Elisa Drago-Serrano (2026-03-31T00:00:00.000Z). Inulin as a Modulator of the Intestinal Barrier: Experimental Evidence, Mechanisms and Clinical Implications.

32 (2023-07-05T00:00:00.000Z). Effects of FODMAPs and Gluten on Gut Microbiota and Their Association with the Metabolome in Irritable Bowel Syndrome: A Double-Blind, Randomized, Cross-Over Intervention Study.

33 Carolin Reichert, Tom Deboer, Hans-Peter Landolt (2022-05-16T00:00:00.000Z). Adenosine, caffeine, and sleep–wake regulation: state of the science and perspectives.

34 Matthew C. Babcock, Austin T. Robinson, Kamila U. Migdal, Joseph C. Watso, Megan M. Wenner, Sean D. Stocker, et al. (2019-01-21T00:00:00.000Z). Reducing Dietary Sodium to 1000 mg per Day Reduces Neurovascular Transduction Without Stimulating Sympathetic Outflow.

35 Sara Baqar, Nora E. Straznicky, Gavin William Lambert, Yee Wen Kong, John B. Dixon, George Jerums, et al. (2019-03-01T00:00:00.000Z). Comparison of endothelial function and sympathetic nervous system activity along the glucose continuum in individuals with differing metabolic risk profiles and low dietary sodium intake.

36 Jetta J. Oppelaar, Thomas A. Bouwmeester, Anastasia A. Silova, Didier Collard, Rosa D. Wouda, Robert E. van Duin, et al. (2023-10-05T00:00:00.000Z). Salt-sensitive trait of normotensive individuals is associated with altered autonomous cardiac regulation: a randomized controlled intervention study.

SUPPLEMENT RECOMMENDATIONS

BIOFILM DISRUPTION AND IRON HANDLING

37 Gebreselassie Demeke Mihiretie, Simin Masoudi, Mark D. P. Willcox (2026-05-19T00:00:00.000Z). Formidable anti-biofilm and anti-adhesion effects of human lactoferrin against Pseudomonas aeruginosa.

38 Che Y. O'May, Kevin R. Sanderson, Louise F. Roddam, Sylvia M. Kirov, David W. Reid (2024-10-22T00:00:00.000Z). Iron-binding compounds impair Pseudomonas aeruginosa biofilm formation, especially under anaerobic conditions.

39 Anastasia N. Golub, Natalia N. Mikhailova, Maria V. Pomytkina, K. B. Еремеева, Elena A. Shevchik, Galina N. Nikiforova, et al. (2026-08-26T00:00:00.000Z). N-Acetylcysteine as a Bacterial Antibiofilm Adjuvant: Mechanisms, Synergistic Combinations and Clinical Translation.

40 (2024-01-30T00:00:00.000Z). The effectiveness of oral bovine lactoferrin compared to iron supplementation in patients with a low hemoglobin profile: A systematic review and meta-analysis of randomized clinical trials | BMC Nutrition | Springer Nature Link.

41 Sabeel Padinhara Valappil, Ensanya A. Abou Neel, Kazi M. Zakir Hossain, Willi Paul, Durgadas Cherukaraveedu, Benjamin P. Wade, et al. (2023-12-19T00:00:00.000Z). Novel lactoferrin-conjugated gallium complex to treat Pseudomonas aeruginosa wound infection.

42 MaiiAtef Shams Eldeen, Eman Elfeky, Amel Hashish, AzzaMahmoud Hassan (2019-01-01T00:00:00.000Z). Comparison of inhibitory effect between DL–tryptophan and lactoferrin on Pseudomonas aeruginosa biofilm formation in wound dressing.

HERBAL ANTIMICROBIALS AND METHANOGEN-TARGETED THERAPY

43 Victor G Chedid, Sameer Dhalla, John O. Clarke, Bani Chander Roland, Kerry B. Dunbar, Joyce M. Koh, et al. (2025-02-07T00:00:00.000Z). Herbal Therapy is Equivalent to Rifaximin for the Treatment of Small Intestinal Bacterial Overgrowth.

44 Jiaxin Chen, X J Li, Yanhua Ou, Yaqian Hu, Yuehua Chen, Fangwen Xu, et al. (2026-06-30T00:00:00.000Z). Berberine as an Antimicrobial Agent and Gut Microbiota Modulator: Mechanisms and Therapeutic Potential.

45 Joy J. Liu, Emerald Adler, Darren M. Brenner (2022-10-01T00:00:00.000Z). S579 Effects of an Herbal Supplement on Intestinal Methanogenic Overgrowth.

46 Kenneth Brown, Brandi Scott-Hoy, Linda W. Jennings (2016-01-01T00:00:00.000Z). Response of irritable bowel syndrome with constipation patients administered a combined quebracho/conker tree/M. balsamea Willdextract.

47 S Lazzini, W Polinelli, Antonella Riva, Paolo Morazzoni, Ezio Bombardelli (2016-01-01T00:00:00.000Z). The effect of ginger (Zingiber officinalis) and artichoke (Cynara cardunculus) extract supplementation on gastric motility: a pilot randomized study in healthy volunteers..

48 Michael Ruscio, Gavin Guard, Darla O'Dwyer, Ray L. Darville, Hannah Klopf, Robert D. Abbott, et al. (2025-12-13T00:00:00.000Z). Biofilm Disruption Enhances Antimicrobial Therapy for Small Intestinal Bacterial Overgrowth and Intestinal Methanogen Overgrowth.

REBUILD AND BARRIER REPAIR

49 (2025-11-24T00:00:00.000Z). Frontiers | Tributyrin (CoreBiome®) enhances butyrate levels and modulates the gut microbiota, barrier function, and immune response in vitro.

50 (2019-07-01T00:00:00.000Z). Supplementation with Akkermansia muciniphila in overweight and obese human volunteers: a proof-of-concept exploratory study | Nature Medicine.

51 Asif Mahmood, A.J. FitzGerald, Tania Marchbank, Eleana Ntatsaki, David J. Murray, Subrata K. Ghosh, et al. (2025-02-08T00:00:00.000Z). Zinc carnosine, a health food supplement that stabilises small bowel integrity and stimulates gut repair processes.

52 (2020-04-28T00:00:00.000Z). Prebiotic Effects of Partially Hydrolyzed Guar Gum on the Composition and Function of the Human Microbiota—Results from the PAGODA Trial.

53 (2025-11-14T00:00:00.000Z). Use of Sodium Butyrate and Its Microencapsulated Forms in Intestinal Diseases—Current Clinical Approach | Digestive Diseases and Sciences | Springer Nature Link.

54 Konstantinos Efthymakis, Matteo Neri (2022-06-02T00:00:00.000Z). The role of Zinc L-Carnosine in the prevention and treatment of gastrointestinal mucosal disease in humans: a review..

MITOCHONDRIAL SUPPORT

55 Eun Jung Choi, Dipanjan Chanda, Ibotombi Singh Sinam, Min-Ji Kim, Jae-Han Jeon, In-Kyu Lee (2024-05-01T00:00:00.000Z). Thiamine Derivative Enhances Mitochondrial Function To Reduce Vascular Calcification.

56 Luke Izzo, Sophie Trefely, Christina Demetriadou, Jack M. Drummond, Takuya Mizukami, Nina Kuprasertkul, et al. (2023-05-03T00:00:00.000Z). Acetylcarnitine shuttling links mitochondrial metabolism to histone acetylation and lipogenesis.

57 Zdeněk Fišar, Jana Hroudová, Namrata Singh, Anna Kopřivová, Diana Maceckova (2016-01-01T00:00:00.000Z). Effect of Simvastatin, Coenzyme Q10, Resveratrol, Acetylcysteine and Acetylcarnitine on Mitochondrial Respiration.

58 (2022-05-31T00:00:00.000Z). Frontiers | Vitamin D Supplementation Improves Mitochondrial Function and Reduces Inflammation in Placentae of Obese Women.

59 (2016-01-16T00:00:00.000Z). An acetyl-L-carnitine switch on mitochondrial dysfunction and rescue in the metabolomics study on aluminum oxide nanoparticles | Particle and Fibre Toxicology | Springer Nature Link.

60 (2025-09-29T00:00:00.000Z). Frontiers | Mitochondrial dysfunction as a therapeutic nexus in HFpEF: therapeutic target and pharmacological advances.

ALGINATE FOR NOCTURNAL REFLUX

61 Matthias Knarr (2025-01-01T00:00:00.000Z). Advanced analysis of alginate for treatment of gastroesophageal reflux disease.

62 Caroline Louise Hoad, Matthias Knarr, Abdulsalam I. Aliyu, Olivier E. Mougin, Jan Paul, Luca Marciani (2025-07-10T00:00:00.000Z). Investigations of Anti-Reflux Formulations Containing Alginates Using MRI: A Feasibility Study Using Conventional 3.0T and 0.5T Open Upright Scanning.

63 Nassiba Moghni, Abdelkader Hadjsadok (2023-11-26T00:00:00.000Z). Design and characterization of alginate-xanthan based raft forming suspension for acid reflux treatment: rheological study and produced CO2 assessment.

64 Christina Reimer, Anders Bergh Lødrup, Darren Smith, James D. Wilkinson, Peter M. Bytzer (2016-02-22T00:00:00.000Z). Randomised clinical trial: alginate (Gaviscon Advance) vs. placebo as add-on therapy in reflux patients with inadequate response to a once daily proton pump inhibitor.

65 K. R. Palaniswamy (2024-11-16T00:00:00.000Z). Expert consensus on the multifaceted utility of alginates in addressing diverse manifestations of acid reflux.

66 David A. Leiman, Brian P. Riff, Sherry Morgan, David C. Metz, Gary W. Falk, Benjamin C. French, et al. (2017-03-29T00:00:00.000Z). Alginate therapy is effective treatment for GERD symptoms: a systematic review and meta-analysis.