OCW WP 059 / V1.0 / 4 NOV 2026

PATIENT GUIDE

IV vitamin and hydration therapy *infusions and add ons*

Wellness infusions deliver fluids, vitamins, minerals and amino acids straight into a vein. The research on each ingredient, and the risks of an infusion, are set out with their sources.

THERAPY	CONTENTS	GIVEN	RESEARCH	SOURCES
IV infusion	Fluids, vitamins	In clinic, by vein	Small, early trials	32 · PMID linked

§ 01

Overview

An intravenous (IV) infusion delivers fluid, vitamins, minerals or amino acids straight into a vein. Hospitals use the same ingredients to replace lost water and salts, correct deficiencies and feed people who cannot eat.[21] [22] [23] Wellness infusions offer them to people who are generally well and want support with energy, hydration, immune health or recovery. The research on that use is far smaller, so this guide sets out what each infusion contains and what has been tested.

The OC Wellness menu includes a hydration and vitamin infusion, a Myers style infusion, an immune support infusion, a recovery infusion and single ingredient add ons. NAD+ and glutathione are covered separately, in our NAD+ guide (OCW WP 015) and our glutathione guide (OCW WP 054). Every study and label we rely on is listed at the end, with links so you can read it yourself.

885 **Micromoles per liter of vitamin C.** That was the average peak blood level after 1.25 g given by vein to healthy volunteers, against 134.8 after the same dose by mouth.[1]

141 **Healthy office workers in a randomized trial.** A single 10 g infusion of vitamin C lowered fatigue scores at two hours and one day compared with saline alone.[2]

34 **Adults in the only placebo controlled Myers trial.** People with fibromyalgia improved on weekly infusions, and so did those given plain fluid; the groups did not differ significantly.[3]

100 mL **The limit for athletes.** The 2026 World Anti Doping Agency list bans infusions or injections above 100 mL in any 12 hours outside hospital treatment, surgery or clinical diagnostic investigations.[24]

§ 02

What IV infusions are

Each infusion starts with a bag of sterile fluid. Saline is salt water at the strength of body fluids. Lactated Ringer's solution adds potassium, calcium and lactate to the sodium and chloride, and it is FDA approved as a source of water and electrolytes.[21] Vitamins, minerals or amino acids are then added to the bag, or given slowly through the same line, on a physician's prescription.

The best known mixture is the Myers cocktail, named after the late John Myers, MD. In 2002 the physician Alan Gaby, building on Myers's work, described a modified version made of magnesium, calcium, B vitamins and vitamin C.[4] Our Myers style infusion follows that pattern, and your physician can tell you the exact contents and amounts of any infusion you are offered.

THE INFUSIONS ON OUR MENU What each one contains, and whether it has been studied as a whole.

INFUSION	WHAT IT CONTAINS	RESEARCH ON THE INFUSION ITSELF
Hydration and vitamin	IV fluid with added vitamins	Trials of IV versus oral fluids, mainly in athletes[5]
Myers style	Magnesium, calcium, B vitamins and vitamin C[4]	One small placebo controlled pilot trial, in fibromyalgia[3]
Immune support	High dose vitamin C and zinc	No trial of this combination found; IV vitamin C studied on its own[2]
Recovery	Fluids, electrolytes and amino acids	No recovery trial found; laboratory studies of muscle protein building[6]
Add ons	A single ingredient added to a base infusion	Depends on the ingredient; NAD+ and glutathione have their own guides

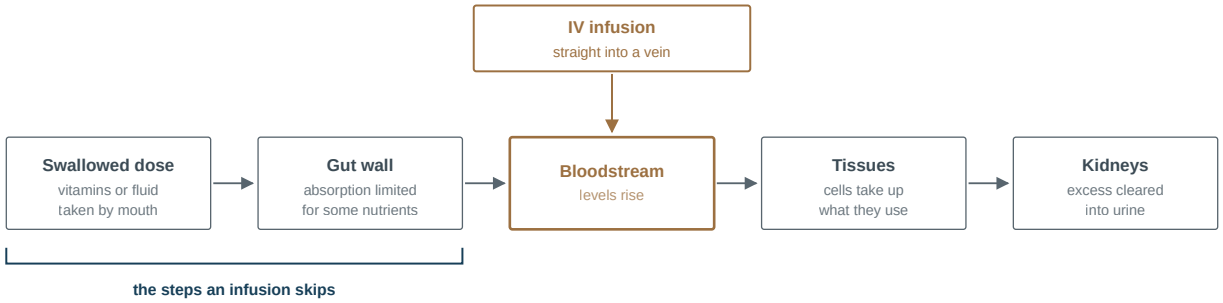
§ 03

How IV infusions work

A vitamin you swallow has to cross the gut wall before it reaches the blood, and for some nutrients the body controls how much gets through. Vitamin C shows this clearly. In 17 healthy volunteers, blood levels after oral doses stayed within a narrow range, while the same doses given by vein produced much higher peaks, and the gap widened as the dose rose.[1]

Those high levels are brief. The kidneys clear what the body does not keep, and the predicted peak urine concentration of vitamin C after an infusion was 140 times that of the highest oral doses.[1] A major route for breaking down vitamin C ends in oxalate in the urine, so kidney health matters for high doses.[22] Magnesium is also removed from the body only by the kidneys.[25]

Fluid given by vein enters the circulation at once. In trained cyclists who had been dehydrated by 4 percent of their body weight, an IV refill restored plasma volume better than drinking the same amount over the first minutes.[7] A review of these studies found that the advantage was usually short lived, with only small differences in hydration markers between the two routes. Drinking also sends signals from the mouth and throat that settle thirst and help the body hold on to fluid, and an infusion bypasses them.[5]



An infusion bypasses the gut and puts its contents straight into the blood. Blood levels of vitamin C can rise far higher by vein than any oral dose allows, and the kidneys then clear what the body does not keep.[1] Magnesium is also removed only by the kidneys.[25]

KEY POINT

A higher blood level shows that an infusion delivers its contents. It does not on its own show a health benefit, which has to be tested in clinical trials. For the Myers style infusion, the one placebo controlled trial found no statistically significant difference from a bag of plain fluid.[3]

§ 04

What the research shows

The published human research on wellness infusions is small. It consists of studies of single ingredients given by vein, a few trials of mixed infusions, and laboratory studies of how the body handles what is infused.

What the evidence supports

Giving a vitamin by vein raises blood levels well beyond what the gut allows. The vitamin C study described in §03 measured this directly in healthy people, and the difference grew with the dose.[1]

High dose IV vitamin C eased fatigue for a day in one trial of healthy workers. In 141 office workers aged 20 to 49, a single infusion of 10 g of vitamin C in saline lowered fatigue scores at two hours and one day compared with saline alone, with no significant difference in side effects. The benefit appeared in people whose vitamin C levels were low to begin with and not in those whose levels were already high.[2] A 2021 systematic review of high dose IV vitamin C for fatigue found nine studies with 720 participants whose fatigue came from various illnesses, and three of its four controlled trials reported less fatigue with vitamin C.[8]

Fluids by vein rehydrate, and so does drinking. After dehydration, cyclists rode for 34.9 minutes before exhaustion when they drank and 29.5 minutes after an IV refill, a difference that was not statistically significant, and both lasted longer than with no fluid (18.9 minutes). Body temperature was lower for the first 24 minutes of exercise when they drank.[7] In a 2026 trial in recreationally active men exercising in the heat, drinking 25 mL of water every five minutes gave a faster 12 km time trial than the same volume of saline by vein (17.7 against 19.6 minutes), with lower core temperature and less thirst.[9] Across the studies reviewed in 2010, neither route improved later exercise performance more than the other.[5]

Muscle uses amino acids delivered by vein. In a laboratory study of six untrained men, an amino acid infusion raised muscle protein building by 291 percent after leg resistance exercise and by 141 percent at rest.[6] The International Society of Sports Nutrition reports the same synergy when protein is eaten before or after resistance exercise, and states that 1.4 to 2.0 g of protein per kilogram of body weight a day is enough for most people who exercise.[10]

What is not yet known

Whether the Myers cocktail helps more than fluid alone. Gaby's 2002 paper reports his own clinical experience across many conditions and reviews earlier work; it is not a controlled trial.[4] An uncontrolled pilot gave seven people with longstanding fibromyalgia weekly infusions for eight weeks, and all reported less pain and fatigue, though none had complete or lasting relief.[11] The placebo controlled trial that followed randomized 34 adults with fibromyalgia to weekly Myers infusions or weekly lactated Ringer's solution for eight weeks. Both groups improved, and no outcome differed significantly between them, partly because the placebo response was large and the trial was small. The authors concluded that its effect relative to placebo is uncertain.[3]

Whether immune infusions prevent infections. We found no trial of IV vitamin C with zinc in healthy people. The evidence for preventing colds comes from these nutrients taken by mouth. In a Cochrane review, regular oral vitamin C did not reduce the number of colds in the general population (10,708 participants), though it shortened colds in adults by 8 percent, and it halved the risk in 598 marathon runners, skiers and soldiers under heavy physical stress.[12] A 2024 Cochrane review of 34 zinc trials, given as lozenges, tablets, syrups, powders, capsules or nasal sprays and never by vein, found that zinc may have little or no effect on preventing colds but may shorten a cold already underway, with more minor side effects.[13] In people who are critically ill, high dose IV vitamin C has been tested and did not help: in 872 adults with sepsis, death or persistent organ failure at 28 days occurred in 44.5 percent on vitamin C and 38.5 percent on placebo, a result in sepsis that says little about healthy people.[14]

Whether infusions speed recovery from training. We found no published trial that tested IV amino acids or IV vitamins against a comparison and measured soreness, strength or performance in healthy people who exercise. The human studies that exist measure muscle protein building in the laboratory[6] or compare IV with oral fluids.[5]

HUMAN STUDIES OF IV VITAMINS, FLUIDS AND AMINO ACIDS

STUDY	N	WHO AND HOW	MAIN FINDING
Padayatty 2004[1]	17	Healthy volunteers; vitamin C by mouth and by vein	Peak 885 against 134.8 micromoles per liter at 1.25 g
Suh 2012[2]	141	Healthy office workers; 10 g vitamin C or saline, once; randomized	Lower fatigue at two hours and one day
LOVIT 2022[14]	872	Sepsis in intensive care; vitamin C or placebo; randomized	Death or organ failure 44.5 percent against 38.5 percent
Ali 2009[3]	34	Fibromyalgia; weekly Myers infusions or lactated Ringer's for 8 weeks; randomized	Both groups improved; no significant difference
Casa 2000[7]	8	Trained cyclists after dehydration; drink, IV or no fluid	Similar time to exhaustion with drink or IV
Biolo 1997[6]	6	Untrained men; amino acid infusion at rest and after exercise	Muscle protein building up 291 percent after exercise

SUMMARY

The ingredients are familiar medicines with clear uses in deficiency and illness, and giving them by vein reliably raises their blood levels. Trials in people who are generally well are few and small: high dose vitamin C eased fatigue for a day in one, the placebo controlled Myers trial found no clear difference from plain fluid, and drinking matched IV fluid in athletes. We will talk through with you whether an infusion fits your goals, and when fluids, food or a supplement by mouth may serve you as well.

§ 05

How IV infusions are given

Every infusion on our menu is given in the clinic, through a vein. A clinician places a cannula, a thin plastic tube, into a vein in the arm or hand and connects it to the bag, and the fluid runs in at a rate the clinician sets. The cannula comes out at the end of the session.

Why the rate matters

Several ingredients cause side effects if they go in too quickly, so they are diluted and given slowly. The FDA label for IV vitamin C warns that rates above 250 mg per minute may cause temporary faintness, nausea, lethargy, flushing, dizziness and headache.[22] With magnesium, small doses cause only flushing and sweating, while larger doses lower blood pressure.[25] Rapid injection of calcium gluconate can widen blood vessels, lower blood pressure, slow the heart and disturb its rhythm, so its label calls for dilution and a slow infusion.[26]

Why the mixture is prepared with care

Ingredients that are safe on their own can react when combined. The vitamin C label says not to mix it with solutions containing elements it can chemically reduce, such as copper,[22] and calcium gluconate can form a precipitate if mixed with fluids containing phosphate or bicarbonate.[26] Zinc sulfate injection is acidic and is never given undiluted; its label requires it to be diluted in a larger volume of fluid first.[27]

Doses

No regulator has set a dose for any wellness infusion. Each ingredient's FDA label gives doses only for its approved use, and wellness practice often uses far larger amounts. The approved adult dose of IV vitamin C for scurvy is 200 mg once a day for up to one week,[22] whereas the fatigue trial used 10 g, infused over 30 minutes,[2] and practitioners surveyed in 2006 and 2008 reported an average of 28 g every four days.[15] The amounts in your infusion are set by your physician, who can show you exactly what is in the bag.

DOSES ON THE FDA LABELS AND IN THE STUDIES CITED Label doses apply only to each ingredient's approved use.

INGREDIENT	SOURCE	USE	ADULT DOSE
Vitamin C	FDA label[22]	Scurvy, when it cannot be taken by mouth	200 mg once daily for up to 1 week, infused at 33 mg per minute
Magnesium sulfate	FDA label[25]	Severe magnesium deficiency	5 g in 1 liter of fluid, infused over 3 hours
Zinc sulfate	FDA label[27]	Zinc in intravenous feeding	3 mg a day, diluted in feeding solution
Amino acids	Laboratory study[6]	Muscle protein research	About 0.15 g per kg of body weight an hour for 3 hours

Add ons

An add on is a single ingredient given with a base infusion. If you are considering NAD+ or glutathione, please read our NAD+ guide (OCW WP 015) or our glutathione guide (OCW WP 054), which cover those products and their own evidence in detail.

§ 06

What to expect

Placing the cannula is a brief needle prick, much like having blood drawn. As the infusion runs, magnesium can bring flushing and light sweating.[25] If you feel faint, sick, flushed or dizzy, tell us, because these feelings are linked to the rate and the drip can be slowed.[22] Even after a full bag you may still feel thirsty, since an infusion does not trigger the thirst signals that drinking does, and you are welcome to drink.[9][5]

How soon people notice anything has been measured only in a few studies. In the vitamin C trial, fatigue scores were lower two hours after the infusion and stayed lower the next day.[2] People in the uncontrolled Myers pilot reported more energy within 24 to 48 hours of the first infusion,[11] though in the placebo controlled trial the group given plain fluid also improved.[3] Effects you feel in the chair can come from rest, attention and expectation as well as from the bag, which is one reason we write down your goals before you start.

DURING YOUR VISIT

- Tell us straight away if the area around the cannula becomes swollen, painful, tight or cool, which can mean fluid is leaking into the tissue.[16]
- Tell us at once about itching, rash, swelling of the face or throat, wheezing or difficulty breathing, which can signal an allergic reaction.[21][28]
- Shortness of breath or chest tightness during or after an infusion also needs prompt attention, since too much fluid can collect in the lungs.[21]

§ 07

Safety

Most people tolerate infusions well, and serious problems are uncommon. In a 2010 survey of practitioners who used high dose IV vitamin C, side effects were reported in 101 of the 9,328 patients with data, mostly minor, the most common being lethargy or fatigue in 59.[15] Some risks come from the drip itself and others from particular ingredients.

Risks from the drip itself

The figures below come from large reviews of IV cannulas, most of them in hospitals, where a cannula often stays in for days. A clinic infusion uses the cannula for one session, and in hospital studies a longer dwell time raised the risk of infection.[17] Across 76,977 cannulas, phlebitis, an inflamed vein, was recorded in 19.3 percent where the study defined it, infiltration, fluid leaking into the surrounding tissue, in 13.7 percent and pain at the site in 6.4 percent.[16] Infection was rare: 0.150 percent of cannulas at the site and 0.028 percent in the bloodstream.[18] Calcium needs particular care, because if it leaks out of the vein it can cause calcium deposits in the skin and, in the worst cases, tissue damage.[26]

Fluid overload. Depending on the volume and the rate, IV fluid can overload the circulation and cause fluid in the lungs, and the label for lactated Ringer's solution advises avoiding it in people at risk of overload, including those with severe kidney impairment.[21] **Allergic reactions.** Serious allergic reactions, including anaphylaxis, have been reported with IV thiamine (vitamin B1), especially after repeated doses, and deaths have occurred.[28] Hypersensitivity reactions are also listed on the labels for multivitamin injection and for lactated Ringer's solution.[28][21]

High dose vitamin C

The vitamin C label carries two warnings that matter most for immune infusions. People with glucose 6 phosphate dehydrogenase (G6PD) deficiency, an inherited enzyme condition, are at risk of severe hemolysis, the breakdown of red blood cells.[22] In one published case, a man developed hemolysis requiring three units of transfused blood after a 75 g

infusion; earlier tests in his records had shown low G6PD levels. [19] The second warning is oxalate nephropathy, kidney damage from oxalate crystals, along with kidney stones. People with kidney disease, a history of oxalate stones and older adults are at higher risk. [22] A single 45 g infusion was followed by acute kidney failure, and later death, in a woman who already had kidney disease. [20] [15] The authors of the 2010 survey advise against high dose IV vitamin C for anyone with kidney disease, G6PD deficiency, a history of oxalate stones or paroxysmal nocturnal hemoglobinuria. [15] Vitamin C can also distort blood and urine glucose readings, and the label suggests delaying such tests until 24 hours after an infusion where possible. [22]

Magnesium, calcium and zinc

Magnesium by vein should not be given to people with heart block or heart muscle damage, and with poor kidney function it can build up to toxic levels. [25] Calcium given with digoxin can cause abnormal heart rhythms. [26] Zinc taken in high doses over months to years can cause copper deficiency. [27]

TELL YOUR PHYSICIAN BEFORE STARTING IF ANY OF THESE APPLY

- You have kidney disease, or you have had kidney stones. [22]
- You have G6PD deficiency or paroxysmal nocturnal hemoglobinuria, or a family history of either. [22] [15]
- You have heart disease, heart failure, a heart rhythm problem or heart block, or you take digoxin. [25] [26] [21]
- You have diabetes and check your glucose with a meter. [22]
- You have ever reacted to a vitamin injection, thiamine or any IV fluid. [28]
- You are pregnant, trying to conceive or breastfeeding. [22] [25]
- You compete in a sport with drug testing (see §09).
- You take any prescription medicine, over the counter product or supplement. Please bring the full list.

No study has followed people receiving repeated wellness infusions over years, and the controlled trials described here lasted from a single session to eight weeks. [2] [3] We review how you are doing before each decision to continue, and we do not plan open ended courses.

§ 08

Is this right for you

An infusion suits some patients and is not the right starting point for others. Your consultation is where we work that out together.

Before we begin

- [ ] A review of your medical history, current medications and supplements
- [ ] Blood pressure and heart rate, so that we have a starting point
- [ ] Baseline bloodwork where your physician recommends it, so that anything we see later can be compared against where you began
- [ ] A written note of what you are hoping to feel, so that we can tell together whether it worked

If you have been feeling run down, often thirsty or slow to recover, we will look for a cause first. Fatigue, dehydration and poor recovery each have causes that respond to simple treatment, and finding one of those would serve you better than any infusion.

Reviewing your progress

We will compare how you feel against the goals you wrote down before deciding together whether to continue. If an infusion is not helping, we will say so and look at other options. You are welcome to stop at any time.

> **QUESTIONS TO ASK YOUR PHYSICIAN**
>
> What exactly is in my infusion, and how much of each ingredient? Would fluids, food or a supplement by mouth do the same job for me? Do I need a G6PD test or a kidney check before high dose vitamin C? What would you expect me to notice, and by when?

§ 09

Regulatory status

The mixed infusions described in this guide are not FDA approved products. Each is prepared for an individual patient on a physician's prescription by combining separately made ingredients, which is compounding.[29] Compounded drugs are not FDA approved, and the FDA does not verify their safety, effectiveness or quality before they are used.[30] The FDA has given adding vitamins to IV infusion bags as an example of sterile compounding, has drawn attention to IV hydration clinics, medical spas and mobile infusion services, and has said that patients can be significantly harmed when sterility or quality cannot be assured.[29]

Many of the individual ingredients are available as FDA approved injections, each for specific uses.

WHAT THE INDIVIDUAL INGREDIENTS ARE APPROVED FOR From the FDA labels of the products named.

INGREDIENT	FDA APPROVED USE
Vitamin C (Ascor)	Short term treatment of scurvy, up to one week, when vitamin C cannot be taken by mouth; not for deficiency without signs of scurvy[22]
Magnesium sulfate	Magnesium deficiency; seizures in preeclampsia and eclampsia[25]
Calcium gluconate	Acute symptomatic low blood calcium[26]
B vitamins	Thiamine, pyridoxine and vitamin B12 injections for deficiency of that vitamin; a multivitamin injection for people on intravenous feeding[28]
Zinc sulfate	A source of zinc in intravenous feeding[27]
Amino acids	A source of amino acids in intravenous feeding[23]
Lactated Ringer's	A source of water and electrolytes[21]

Using these ingredients for general wellness, or in amounts above the label, is off label. A physician may prescribe off label, and it is a decision your physician makes with you. High dose vitamin C is an example: the approved product is labelled for scurvy at 200 mg a day.[22]

For athletes, the rule concerns the method, whatever the bag contains. Section M2.2 of the World Anti Doping Agency's 2026 Prohibited List bans "intravenous infusions and/or injections of more than a total of 100 mL per 12 hour period except for those legitimately received in the course of hospital treatments, surgical procedures or clinical diagnostic investigations," and the ban applies at all times, in and out of competition.[24]

If you would like details about the preparation used in your treatment, please ask.

§ 10

Common questions

Are IV vitamin infusions approved by the FDA?

The mixed infusions are not FDA approved. They are compounded for each patient on a prescription, and the FDA does not verify compounded drugs for safety, effectiveness or quality before use.[30] Several ingredients, such as vitamin C, magnesium sulfate and zinc sulfate, are FDA approved injections for specific deficiencies or medical uses, so their use for wellness is off label. [22] [25] [27]

Is an infusion better than taking vitamins by mouth?

An infusion raises blood levels much higher: 1.25 g of vitamin C by vein gave a peak of 885 micromoles per liter in healthy volunteers, against 134.8 by mouth.[1] Higher levels have not been shown to give a lasting benefit in healthy people. For fluids, drinking performed as well as IV fluid in athletes, and in one trial it gave a faster time trial. [7] [9]

Is it safe, and what side effects should I expect?

In a survey of practitioners using high dose IV vitamin C, side effects were reported in 101 of 9,328 patients, mostly minor.[15] The most common problems come from the cannula, such as an inflamed vein or fluid leaking into the tissue. [16] Allergic reactions, fluid overload, hemolysis in G6PD deficiency and kidney injury from oxalate are rare but serious, so we review your history first. [28] [21] [22]

How soon would I notice anything?

Few studies measured this. In the vitamin C trial in office workers, fatigue scores were lower at two hours and the next day.[2] In the fibromyalgia trial, people given plain fluid also improved, and the difference from the Myers infusion was not statistically significant. [3]

Will an immune infusion stop me catching colds?

No trial has tested IV vitamin C with zinc for preventing colds in healthy people. Regular vitamin C by mouth did not lower the number of colds in the general population, though it shortened them slightly in adults,[12] and zinc by mouth or nose may shorten a cold without preventing one. [13]

Can a recovery infusion help me bounce back after training?

No published trial has tested IV amino acids or vitamins on soreness, strength or performance. Amino acids by vein are used by muscle in laboratory studies,[6] and the International Society of Sports Nutrition reports the same effect from eating protein around exercise. [10]

Who should not have high dose vitamin C?

The authors of a 2010 survey of its use advise against it for people with kidney disease, a history of oxalate kidney stones, G6PD deficiency or paroxysmal nocturnal hemoglobinuria.[15] The label also advises keeping to the recommended dietary amount during pregnancy and breastfeeding. [22]

Where is a compounded medicine made, and who oversees it?

Federal law sets out two kinds of compounding. Under section 503A, a state licensed pharmacy or physician prepares a medicine for one patient against that patient's own prescription, and the state board of pharmacy carries the day to day oversight while the FDA inspects for cause and on surveillance.[30] Under section 503B, an outsourcing facility registers with the FDA, works to federal manufacturing quality standards, reports adverse events and the products it makes to the agency, and is inspected by the FDA on a risk based schedule; it may also supply a clinic directly rather than for one named patient. [31] We use both kinds, and which one prepares your medicine depends on the preparation.

Is a compounded medicine the same as an FDA approved one?

No, and one infusion can involve both. Several of the ingredients are FDA approved injections in their own right, each for a specific medical use,[22] [25] [27] while the mixture prepared for you is compounded, and an approved product is the first choice whenever one fits your situation. [30] What a prescription from a licensed pharmacy or a registered outsourcing facility does give you is a named prescriber, a facility answerable to a state board or to the FDA, ingredients that meet federal requirements, and a route for reporting a problem. A vial bought online and labelled for research use only has none of that, and the FDA treats those products as unapproved new drugs when they are meant for people and has written to the companies selling them, so please do not use one. [32]

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Describes the conditions of sections 503A and 503B, including patient specific prescriptions, current good manufacturing practice requirements for outsourcing facilities, adverse event and product reporting, and risk based inspection. Page current as of 17 December 2024. fda.gov, accessed 4 November 2026.

32 **U.S. Food and Drug Administration.** Warning letter to Royal Peptides LLC.
Center for Drug Evaluation and Research, 24 August 2026. States that products marketed for research use only are intended to be drugs for human use and are unapproved new drugs under section 505(a) of the Federal Food, Drug, and Cosmetic Act. fda.gov, accessed 4 November 2026.

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PATIENT SIGNATURE	DATE	REVIEWING PHYSICIAN

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