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PATIENT GUIDE

Glutathione *injections and infusions*

Glutathione is an antioxidant that every cell makes for itself. Given by injection or infusion it reaches high blood levels briefly, and its benefits in people are still uncertain.

COMPOUND	CLASS	ROUTES	STATUS	SOURCES
Glutathione (GSH)	Tripeptide	IV or into muscle	Not FDA approved	31 · PMID linked

§ 01

Overview

Glutathione is one of the body's own antioxidants. Nearly every cell makes it from three amino acids and keeps a large supply on hand, where it neutralizes reactive oxygen molecules and helps clear drugs and toxins.[1] [2] Blood levels tend to fall with age in healthy adults, which is part of the interest in topping it up. [3]

At OC Wellness glutathione is given as an injection into the muscle, as an infusion into a vein, or as an add on to another IV infusion. The human research behind these routes is smaller than the popularity of glutathione might suggest. Studies in people have measured how quickly injected glutathione leaves the blood, whether it helped in Parkinson disease, whether it protected nerves during chemotherapy, and whether it lightens skin. Each finding below is labelled with the people studied and the route used, and every source is listed at the end with a link.

3	**Amino acids.** Glutathione is built from glutamate, cysteine and glycine, and cells assemble it themselves in two enzyme steps.[4]
14 min	**Half life in the blood.** After an infusion in 10 healthy volunteers, plasma glutathione rose steeply and then fell with a half life of about 14 minutes.[5]
21	**People in the randomized IV trial.** In Parkinson disease, intravenous glutathione three times a week for four weeks was well tolerated but did not differ significantly from placebo.[6]
30 to 35%	**Rise in stores, by mouth.** Six months of 1,000 mg a day raised glutathione in red cells, plasma and lymphocytes by 30 to 35 percent in healthy adults.[7]

§ 02

What glutathione is

Glutathione is a tripeptide, a chain of just three amino acids: glutamate, cysteine and glycine.[4] Cells build it in two steps. The first enzyme, glutamate cysteine ligase, joins glutamate to cysteine, and the second, glutathione synthetase, adds glycine. How much a cell can make depends mostly on how much cysteine it has and on how active that first enzyme is. [2]

Inside most cells glutathione is present at millimolar concentrations.[1] In plasma it is far scarcer: healthy volunteers in one study had about 6.2 micromoles per liter.[8] It exists in a reduced form, written GSH, which does the protective work, and an oxidized form, GSSG. Researchers use the balance between the two as a marker of oxidative stress.[4][3]

Its work goes well beyond mopping up oxidants. Glutathione binds and helps remove drugs and pollutants, and it takes part in immune function, cell growth and the control of cell death.[2][4] People born with severe defects in the enzymes that make it can have anemia from fragile red blood cells and repeated infections, which shows how much the body relies on it.[1]

GLUTATHIONE AT A GLANCE	
Name	Glutathione
Also called	GSH, reduced glutathione, L glutathione
Structure	Three amino acids: glutamate, cysteine and glycine[4]
Origin	Made inside nearly every cell of the body; also manufactured for supplements and pharmacy use[1]
Class	Tripeptide antioxidant containing a sulfur (thiol) group[2]
How it is given	Infusion into a vein, injection into the muscle, capsules by mouth; nasal spray in research studies[6][9][7][10]

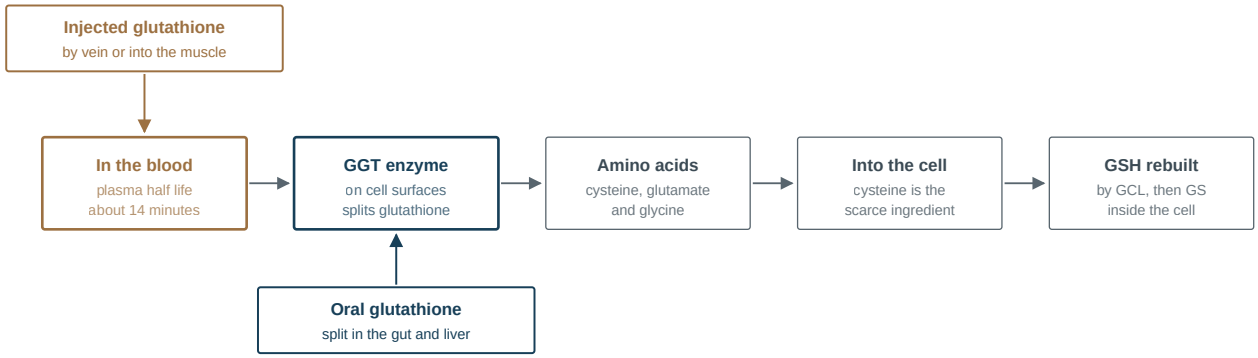
§ 03

How glutathione works

Glutathione does its work inside cells, and that shapes what an injection can do. Once in the blood, it meets an enzyme called gamma glutamyl transpeptidase, or GGT, which sits on the outer surface of cells, including in the kidney. GGT starts splitting glutathione into its three amino acids, which cells can then take in.[11] Cysteine is the ingredient in shortest supply when a cell under oxidative stress needs to make more glutathione, so supplying cysteine is one way glutathione from outside the cell can support the supply within it.[11][2]

A study in 10 healthy volunteers traced this after a single infusion of 2 g of glutathione per square meter of body surface. Total plasma glutathione rose from 17.5 to 823 micromoles per liter and then fell with a half life of about 14 minutes. Plasma cysteine rose from 8.9 to 114 micromoles per liter, which the authors took as a sign that cells were taking up more cysteine. Glutathione in the urine rose 300 fold over the following 90 minutes.[5]

Glutathione swallowed as a capsule meets the same enzymes earlier, in the gut wall and the liver. In 7 healthy volunteers, a single 3 g dose by mouth did not significantly raise plasma glutathione over the next 270 minutes.[8] Daily use over months has raised body stores in some trials, which are described in §04.[7]



Injected glutathione is taken apart and rebuilt. An infusion raises plasma glutathione for minutes. Enzymes on cell surfaces split it into its amino acids, and cysteine is the one cells most need to make their own glutathione.[5] [11] [8]

KEY POINT

Injected glutathione stays in the blood for minutes, and much of its likely value lies in the cysteine it supplies for cells to rebuild their own glutathione. The published human study of an infusion measured plasma and urine, so how much an injection adds to the glutathione held inside cells has not been measured in people.[5] [11]

§ 04

What the research shows

Human research on glutathione falls into four groups: how the body handles a dose, Parkinson disease, protecting nerves during chemotherapy, and skin. In our search we did not find a published trial of injected glutathione for general wellness or energy in healthy people.

What the evidence supports

Blood levels (healthy adults, by vein and by mouth). An infusion raises plasma glutathione steeply but briefly.[5] By mouth, a single dose did not raise plasma levels,[8] and 500 mg twice daily for four weeks in 40 healthy adults changed neither red cell glutathione nor markers of oxidative stress.[12] Longer use gave a different result. In a six month randomized trial in 54 healthy nonsmokers, 1,000 mg a day raised glutathione by 30 to 35 percent in red cells, plasma and lymphocytes, and 250 mg a day raised it by 17 percent in whole blood and 29 percent in red cells. Levels returned to baseline one month after stopping.[7] A one month pilot study of a liposomal form in 12 healthy adults found increases of up to 40 percent in whole blood after two weeks, without a placebo group.[13]

Nerve protection during chemotherapy (adults with cancer, by vein and into the muscle). In a randomized, placebo controlled trial in 50 people with advanced stomach cancer receiving cisplatin, glutathione was infused before each chemotherapy dose and then injected into the muscle on the next four days. After 15 weeks, nerve damage was found in 4 of 24 people assessed in the glutathione group and 16 of 18 in the placebo group, and the response of the cancer to chemotherapy was not reduced.[9] A Cochrane systematic review pooled seven glutathione trials with 387 participants and found a lower risk of moderate or worse nerve damage on clinical grading scales, but judged the data insufficient to conclude that glutathione prevents nerve damage on objective nerve tests.[14] The American Society of Clinical Oncology concluded in 2020 that no agent is recommended for preventing chemotherapy related nerve damage.[15]

Skin color (healthy adults, by mouth). In laboratory studies glutathione inhibits tyrosinase, the enzyme that starts melanin production, and shifts pigment cells toward the lighter form of melanin.[16] In a randomized trial in 60 healthy medical students in Thailand, 500 mg a day by mouth for four weeks lowered the melanin index at all six sites measured, and the

difference from placebo was significant at two of them. [17] A 12 week trial of 250 mg a day in healthy women found melanin readings that tended to be lower than placebo, with fewer wrinkles at some sites. [18] A 2025 systematic review found five randomized trials in which oral glutathione at 250 to 500 mg a day significantly reduced the melanin index compared with placebo. [19]

What is not yet known

Parkinson disease (by vein and by nasal spray). Interest began with an open study in 1996, in which 9 people with early, untreated Parkinson disease received glutathione by vein twice daily for 30 days and their measured disability fell by 42 percent. There was no comparison group.[20] The randomized, placebo controlled pilot that followed, in 21 people whose symptoms were not well controlled on medication, found no significant differences in rating scale scores. Scores improved by 2.8 units more with glutathione over the four weeks of treatment and worsened by 3.5 units more over the eight weeks after it, and neither difference was statistically significant. [6] In a three month trial of glutathione nasal spray in 45 people, every group improved, including the placebo group, and neither dose did better than placebo. [10] A 2026 systematic review called the findings for glutathione in Parkinson disease inconclusive. [21]

Skin lightening by vein. A 2025 systematic review found only one placebo controlled trial of intravenous glutathione for skin lightening, in which 6 of 16 people responded with glutathione and 3 of 16 with placebo, a difference that was not statistically significant. The reviewers concluded that intravenous glutathione should not be used for skin lightening because of its lack of efficacy and its side effects.[19] Earlier reviews also judged the skin evidence inconclusive and noted that how long any lightening lasts is not known. [22] [16]

Injection into the muscle and wellness use. The only human study of glutathione in the muscle in our search was the chemotherapy trial above, where it followed an infusion.[9] How much glutathione reaches the blood from a muscle injection, and whether injections of either kind change energy, recovery or aging in healthy people, have not been tested in published trials.

HUMAN STUDIES Population, route and finding as published

STUDY	N	POPULATION AND ROUTE	REPORTED FINDING
Aebi et al, 1991 [5]	10	Healthy volunteers; one infusion by vein	Plasma glutathione 17.5 to 823 micromoles per liter; half life about 14 minutes
Richie et al, 2015 [7]	54	Healthy nonsmokers; by mouth for 6 months; randomized	Stores up 30 to 35 percent on the higher dose; back to baseline 1 month after stopping
Sechi et al, 1996 [20]	9	Early, untreated Parkinson disease; by vein for 30 days; open label	Disability fell 42 percent; no comparison group
Hauser et al, 2009 [6]	21	Parkinson disease; by vein for 4 weeks; randomized	No significant difference from placebo; well tolerated
Mischley et al, 2017 [10]	45	Parkinson disease; nasal spray for 3 months; randomized	All groups improved; neither dose better than placebo
Cascinu et al, 1995 [9]	50	Stomach cancer on cisplatin; by vein, then into the muscle; randomized	Nerve damage at 15 weeks in 4 of 24 versus 16 of 18 on placebo
Arjinpathana and Asawanonda, 2012 [17]	60	Healthy students; by mouth for 4 weeks; randomized	Melanin index lower than placebo at 2 of 6 sites
Trial summarized by Sarkar et al, 2025 [19]	32	Skin lightening; by vein; placebo controlled	Response in 6 of 16 versus 3 of 16; not significant

SUMMARY

The biology of glutathione is well understood, and it matters to every cell. Given by vein it raises blood levels for minutes, and in the one randomized trial in Parkinson disease it did not differ clearly from placebo. The most consistent human results come from trials in cancer patients receiving chemotherapy, where specialist guidance still does not recommend any preventive agent, and from oral skin studies that measured modest changes in pigment. Injected glutathione for general wellness has not yet been tested in a published trial, and we will give you our view for your own situation.

§ 05

How glutathione is given

The FDA has not set a dose of glutathione for any use, because no glutathione injection is FDA approved.[25] Where a published human study used a specific dose, we give it below so you can see what was tested. These are study doses, not a recommendation, and your physician sets the dose and schedule with you.

Infusion into a vein

This is the most studied injected route. In healthy volunteers, an infusion of 2 g per square meter of body surface was used to measure how the body handles glutathione.[5] In Parkinson disease, studies gave 1,400 mg three times a week for four weeks [6] and 600 mg twice daily for 30 days. [20] In the chemotherapy trial, 1.5 g per square meter was given in 100 mL of saline over 15 minutes before each cisplatin dose. [9] Whatever the dose, plasma levels rise quickly and fall within the hour. [5]

As an add on to another infusion

Glutathione can also be added to an IV infusion you are already receiving. We did not find a published study of glutathione given this way, so what is known comes from the studies of glutathione infused on its own. The volume of the whole infusion matters if you are tested for sport, as explained in §09.[26] Ask your physician what else the infusion contains.

Injection into the muscle

The one human study of this route in our search used 600 mg injected into the muscle on four consecutive days, following an infusion, in people receiving cisplatin.[9] We did not find a published study measuring blood levels after a muscle injection in people, so how quickly and how completely it is absorbed is not known. Some tenderness or redness where the needle went in is possible, as with any injection.

Capsules by mouth

Glutathione taken by mouth is sold as a dietary supplement.[7] A single dose is largely broken down before it reaches the blood, [8] and the trials that raised body stores used daily doses of 250 or 1,000 mg for six months, [7] or 500 or 1,000 mg of a liposomal form for one month. [13] Skin studies used 250 to 500 mg a day for 4 to 12 weeks. [17] [18] A four week trial of 500 mg twice daily found no change in glutathione status, which suggests time matters. [12]

Nasal spray and inhaled forms

Nasal glutathione has been studied in Parkinson disease at 300 or 600 mg a day for three months, and was well tolerated.[23] Inhaled glutathione is a different matter: in a small crossover trial, a 600 mg dose breathed in as a mist narrowed the airways of 8 people with mild asthma. [24] These forms are research routes and are mentioned here for completeness.

COMPARING THE OPTIONS

	INFUSION INTO A VEIN	INJECTION INTO THE MUSCLE	CAPSULES BY MOUTH
How it is given	In clinic, alone or added to an infusion	Small injection in clinic	Daily, at home
Effect on blood levels	Steep rise, half life about 14 minutes[5]	Not measured in people	No rise from one dose;[8] stores rose over months[7]
Human trials	SMALL Parkinson disease, chemotherapy[6 9]	ONE with chemotherapy[9]	SEVERAL randomized trials[7 19]
Doses in published studies	600 to 1,400 mg per dose in Parkinson studies[20 6]	600 mg[9]	250 to 1,000 mg a day[7]
Common experience	Well tolerated in the Parkinson trial[6]	Possible tenderness at the site	Well tolerated in skin trials[17]

Your physician can help you decide whether glutathione fits your goals, and if so, which form and schedule make sense for you.

§ 06

What to expect

The trials looked at specific changes over weeks or months: Parkinson rating scales after four weeks of infusions,[6] nerve function across months of chemotherapy,[9] and skin melanin after 4 to 12 weeks of capsules.[17 18] None of them measured how a healthy person feels in the hours or days after a single injection or infusion, so we cannot point to evidence of an effect you would notice straight away.

The infusion itself was well tolerated in the Parkinson trial, with side effects similar to placebo and no one stopping because of them.[6] Plasma levels fall within the hour,[5] and the studies gave glutathione as a course of repeated doses.[6 20]

DURING YOUR VISIT

- If glutathione is being added to an infusion, ask what else the infusion contains and its total volume.
- Tell us straight away about itching, a rash, tightness in the chest, wheezing or any feeling that is new to you. We would always rather stop and check.
- Keep a simple note of how you feel between visits, so that we can look at any change together.

§ 07

Safety

In the randomized Parkinson trial, glutathione by vein three times a week for four weeks caused no withdrawals for side effects, and the side effects reported were similar to placebo.[6] In the chemotherapy trials pooled by the Cochrane review, side effects were infrequent or not reported.[14] Nasal glutathione met tolerability criteria over three months in 30 people with Parkinson disease, although one person on the higher dose in a later trial developed a heart muscle disorder (cardiomyopathy).[23 10] Capsules were well tolerated in the skin trials, with no serious side effects.[17 18]

Concerns have been raised mainly about intravenous glutathione given for skin lightening. In 2019 the Philippine Food and Drug Administration warned the public against it, listing side effects that include toxic effects on the liver, kidneys and nervous system and the possibility of Stevens Johnson syndrome, a serious skin reaction. It also raised a theoretical concern

about long term skin cancer risk, because glutathione affects melanin, and a risk of infection when the treatment is given by people without medical training or in unsterile settings.[27] Glutathione breathed in as a mist narrowed the airways in people with mild asthma, a reaction the researchers attributed to sulfite formation.[24] There is also a question about cancer. Some tumors carry high levels of GGT and use the cysteine in blood glutathione to keep their own glutathione high, which has been linked to resistance to chemotherapy.[11] In the stomach cancer trial, glutathione did not reduce the response to chemotherapy,[9] but anyone with cancer should decide on glutathione with their oncologist.

TELL YOUR PHYSICIAN BEFORE STARTING IF ANY OF THESE APPLY

- You have a current or past cancer diagnosis, or you are receiving chemotherapy.
- You have asthma, or you have reacted to sulfites.
- You have kidney or liver disease.
- You are pregnant, trying to conceive, or breastfeeding.
- You have had an allergic reaction to an infusion or injection before.
- You compete in a sport that tests for drugs.
- You take any prescription medication, over the counter product or supplement. Please bring the full list.

Long term safety data for injected glutathione do not yet exist. The longest trial by vein in Parkinson disease lasted four weeks of treatment,[6] and the longest oral trial lasted six months.[7] That is one of the reasons we review how you are doing at set points.

§ 08

Is this right for you

Glutathione suits some patients who understand that the evidence for injection is limited and still want to try it, and it is not the right starting point for others. The purpose of your consultation is to work out which group you are in.

Before we begin

- [ ] A review of your medical history, current medications and supplements
- [ ] Blood pressure, and a history of asthma, allergies and any past reactions to infusions
- [ ] Baseline bloodwork, so that anything we see later can be compared against a starting point
- [ ] A clear note of what you are hoping to feel or see, written down, so we can tell together whether it worked

If you are coming to us because of low energy, uneven skin tone or slow recovery, we will look for findable causes first. Each of these can have causes that respond well to specific treatment, and finding one of those would serve you better than any infusion.

Reviewing your progress

We will reassess against your documented starting point after a defined course. If you are doing well, we will plan together whether to continue. If you are not, we will say so and look at other options. You are welcome to stop at any time.

QUESTIONS TO ASK YOUR PHYSICIAN

What would you expect me to notice, and by when? How will we measure whether this is working? Why an injection or infusion rather than capsules in my case? What would make you recommend stopping?

§ 09

Regulatory status

Glutathione is not approved by the U.S. Food and Drug Administration as an injection or infusion for any indication, and there is no FDA approved glutathione injection.[25] When it is given by injection or infusion, it is prepared by a compounding pharmacy on a physician's prescription. Prescribing a compounded preparation is lawful and common in American medicine, and it is a decision your physician makes with you. It does mean no regulator has reviewed this preparation for your use, and you should know that before you consent.

On the FDA list of bulk drug substances nominated for compounding under section 503A, last updated on 14 May 2026, glutathione sits in Category 1, the group of substances the FDA is still evaluating. Under its interim policy, the FDA does not intend to take action against a pharmacy that compounds with a Category 1 substance, provided the conditions in its guidance are met. That policy can continue until the FDA decides whether to add the substance to the list of bulk substances pharmacies may use, or until it removes the substance from Category 1, for example because of safety information. No final decision on glutathione has been made.[28]

Other countries treat glutathione differently. In the Philippines, injectable glutathione is approved as an add on treatment in cisplatin chemotherapy, and the national regulator has stated that no injectable product is approved there for skin lightening.[27] Glutathione capsules taken by mouth are sold as dietary supplements.[7]

If you compete in a tested sport, glutathione itself is not named on the 2026 World Anti Doping Agency Prohibited List, but the way it is given can matter. Section M2.2 prohibits, at all times, “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.” The limit applies to the total volume, whatever the infusion contains. A glutathione add on given with an IV infusion therefore falls under this rule if the infusion, together with anything else given by vein in the same 12 hours, adds up to more than 100 mL, even though glutathione is not a prohibited substance.[26] Please tell your physician before any infusion if you are subject to testing, and check with your sport's antidoping organization.

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

§ 10

Common questions

Is glutathione approved by the FDA?

No glutathione injection or infusion is approved by the FDA, for any indication.[25] When it is given by injection or infusion it is prepared by a compounding pharmacy on a physician's prescription, and the FDA lists glutathione among the substances it is still evaluating for compounding use.[28] Glutathione capsules are sold as dietary supplements.[7]

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

In the randomized Parkinson trial, glutathione by vein three times a week for four weeks was well tolerated, with side effects similar to placebo.[6] Serious problems, including liver, kidney and nerve toxicity and the possibility of Stevens Johnson syndrome, have been described by the Philippine regulator in people given intravenous glutathione for skin lightening.[27] As with any injection, some tenderness where the needle went in is possible, and long term safety data for injected glutathione do not yet exist.

How soon would I notice anything?

The studies did not measure that. They measured changes over weeks or months, such as Parkinson rating scales after four weeks of infusions and skin melanin after 4 to 12 weeks of capsules, always as a course of repeated doses.[6] [17] [18]

How is it given, and for how long?

At OC Wellness glutathione is given as an injection into the muscle, as an infusion into a vein, or added to another IV infusion. Published courses by vein in Parkinson disease lasted four weeks to a month,[6] [20] and the only study of injection into the muscle used four daily injections alongside chemotherapy.[9] The FDA has not set a dose or course length, so your physician sets both with you and reviews your progress against your documented starting point.

Will glutathione lighten my skin?

Oral glutathione at 250 to 500 mg a day reduced the melanin index compared with placebo in several randomized trials, with moderate effects seen mainly on sun exposed skin.[19] [22] The one placebo controlled trial of intravenous glutathione for skin lightening found no significant difference, and a 2025 systematic review advised against using it for that purpose.[19] If skin tone is your goal, please talk with your physician about the options that have been studied for it.

Who should be careful with glutathione?

Talk with your physician before starting if you have a current or past cancer diagnosis or are receiving chemotherapy, because some tumors use glutathione from the blood and your oncologist should be part of the decision.[11] The same applies if you have asthma or have reacted to sulfites, since inhaled glutathione narrowed the airways in people with mild asthma.[24] Please also tell us if you have kidney or liver disease, are pregnant, trying to conceive or breastfeeding, or have reacted to an infusion before, and bring the full list of your medications and supplements.

What happens if I stop?

In the six month oral trial, glutathione levels in the blood returned to baseline within one month of stopping.[7] In the Parkinson trial by vein, the glutathione group worsened by 3.5 units more than the placebo group in the eight weeks after treatment stopped, a difference that was not statistically significant.[6] You are welcome to stop at any time, and your physician can compare how you feel with the starting point you recorded together.

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.[29] 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.[30] 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 the difference matters. A compounded preparation is not FDA approved, and the agency does not check its safety, effectiveness or quality before it is sold, which is why an approved product is the first choice whenever one fits your situation.[29] 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: the FDA treats those products as unapproved new drugs when they are meant for people, and has written to the companies selling them.[31] Please do not use one.

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OC WELLNESS
NEWPORT BEACH

IMPORTANT NOTICE

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PATIENT SIGNATURE	DATE	REVIEWING PHYSICIAN

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