CHAPTER 6

PRP, Light Therapy, and Combined Regenerative Therapy

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Numbered citations in parentheses refer to the list in Chapter 10: References.

Can PRP, Low-Level Light Therapy, and CRT Help Women's Hair Loss?

We offer **platelet-rich plasma (PRP), low-level light therapy, and combined regenerative therapy (CRT) to selected women with hair loss**. PRP studies have reported improvements in hair density in women, although the preparation methods, treatment schedules, and results vary. (87) Low-level light therapy has also shown benefit, particularly for androgenetic alopecia. (88) **We consider these options alongside medical treatment** after determining the cause of the hair loss. They do not replace treatment of an underlying medical condition or active scalp inflammation.

How We Use PRP in Our Practice

PRP is **prepared from a patient's own blood to concentrate platelets**, which release growth factors involved in tissue repair. (76) We use a **dual-spin centrifugation process** and a larger starting blood sample to prepare the PRP. The first spin separates the blood

components, and the second concentrates the platelets. We do not assume that all PRP preparations are equivalent, or that a higher platelet concentration necessarily produces better hair growth.

In premenopausal women, we use dual-spin PRP with microneedling of the PRP. We often add an extracellular matrix, or ECM, which is a **biologic scaffold intended to support the local tissue environment**. The additional benefit of ECM, including whether it prolongs the effects of PRP, has not been established in controlled human hair-loss studies.

A commonly recommended PRP approach begins with three monthly treatments followed by maintenance treatments. The best maintenance interval has not been established. [76] In our practice, we generally reassess patients every four to six months and individualize further treatment according to their clinical findings, HairMetrix measurements, and medical-grade photographs.

How Low-Level Light Therapy Helps Hair Loss in Women

Low-level light therapy, also called photobiomodulation, uses **low-energy light to support hair growth**. It is thought to stimulate the mitochondria, the energy-producing structures within hair-follicle cells. Increased local circulation and changes in inflammatory signaling are other proposed mechanisms, although the precise reasons for its benefit in patients are still being studied. [92]

Low-grade inflammation around hair follicles has been documented in some women with female pattern hair loss. [93] Light therapy may help modify this inflammatory environment, but this has not been established as the mechanism responsible for improved hair growth in women. [92] It should not replace treatment for an active inflammatory or scarring scalp disorder.

We often use low-level light therapy alongside medical treatment or as part of CRT. A randomized trial in women found that **combining light therapy with topical minoxidil produced greater improvement in certain measures of hair thickness than minoxidil alone**. [94] This supports its use as an adjunct, although results vary. Comparable evidence that light therapy enhances finasteride's effects in women is limited.

All low-level light therapy devices are not the same. We advise patients to choose a device that is FDA-cleared for treating female pattern hair loss and has published clinical evidence supporting its use. FDA clearance applies to specific devices and indications. [95] Purchasing one through a medical practice allows us to help select an appropriate device, explain how to use it, and monitor your response.

With the device we use in our practice, we recommend 20 minutes every other day. Patients using another device should follow its specific instructions **because treatment schedules vary**. Improvement takes several months, and consistent use is important. [88, 94] We assess each individual's response with HairMetrix measurements and medical-grade photographs.

Light therapy is generally well tolerated, but scalp irritation, itching, or discomfort may occur. [88] We review the patient's medical history, any condition or medication that increases light sensitivity, and the device's safety instructions, including eye precautions, before recommending treatment.

I also routinely use low-level light therapy following hair transplantation **as an adjunct to postoperative care**. Newly transplanted follicles initially depend on nutrients from surrounding tissue fluid, a process called plasmatic imbibition. Revascularization begins after approximately three days and develops over the first

week. [96] We use light therapy to support the local healing environment, although evidence that it improves transplanted graft survival remains limited.

What Is Combined Regenerative Therapy?

In our practice, we rarely use PRP alone in postmenopausal women. We usually **combine low-level light therapy with microneedling of minoxidil and either finasteride or dutasteride, together with dual-spin PRP**. We refer to this approach as **combined regenerative therapy, or CRT**. The medication component is delivered locally as part of the procedure; this is distinct from prescribing oral dutasteride, which we do not use for women. We use CRT as part of a comprehensive regenerative hair-restoration program.

We initially perform CRT monthly for six months. In our clinical experience, most patients notice improvement after the first three treatments, although the timing and degree of response vary. We obtain baseline HairMetrix measurements of hair density, hair width, and miniaturization, together with medical-grade photographs, and repeat these assessments during follow-up.

After the initial course, we reassess patients every four to six months. If HairMetrix measurements show a decline, we review the photographs and scalp examination to determine whether the change represents renewed hair loss. We usually perform a single maintenance treatment when the findings support it, then reassess after another four to six months. This schedule reflects our clinical experience; the complete combination and maintenance approach have not been established in large controlled studies.

Can a Minoxidil-Only Combination Be Considered Before Menopause?

We currently reserve our CRT protocol containing finasteride or dutasteride **for postmenopausal women**. In selected premenopausal women, we may consider a modified combination using minoxidil without either of these medications, together with PRP, microneedling, and low-level light therapy. This is an option under consideration, rather than our established protocol.

A randomized study of 120 premenopausal women found greater improvement in hair density with minoxidil plus microneedling than with minoxidil alone. [89] This supports considering the combination, but it does not establish the benefit or safety of adding every component of CRT or using our six-month schedule.

Safety Considerations For CRT

Microneedling may cause temporary discomfort, redness, and bleeding; infection and scarring are additional risks. We assess scalp health, bleeding disorders, blood-thinning medications, impaired healing, and a tendency to form keloid scars before recommending treatment. The FDA has not cleared microneedling devices to deliver medications or PRP into the skin. We explain this when discussing the procedure and obtaining informed consent. [90]

Minoxidil delivered through microneedling requires particular attention to the formulation, concentration, volume, and needle depth because penetration differs from application to intact scalp skin. The study in premenopausal women reported irritation, unwanted facial hair, one infection, and one case of postural hypotension in the minoxidil-plus-microneedling group. [89] We review cardiovascular history, blood pressure, and other medications before considering this approach. Patients should report dizziness, palpitations, swelling, or chest pain promptly. [91]

We do not use minoxidil during pregnancy or breastfeeding and discuss stopping treatment with women planning pregnancy. [80] Removing finasteride and dutasteride from a combination avoids their reproductive risks, but it does not make the remaining procedure appropriate for every patient. ECM suitability also depends on the particular product, its source, and the patient's allergy history.

Our goal is to **choose an approach that fits the diagnosis and the patient's medical history, then document whether it is helping**. HairMetrix and medical-grade photography allow us and our patients to follow the response over time.

What Future Hair Loss Treatments Are We Studying?

Our interest in regenerative hair restoration also **extends beyond the treatments currently available in clinical practice**. Together, with colleagues at UCSD and Sanford Burnham Prebys, **we are involved in research investigating future cell-based treatments derived from a patient's own hair follicles**. Our preliminary laboratory findings suggest that whole human hair follicles can be cryopreserved and biobanked while maintaining their ability to generate viable follicle-associated cells after thawing. The long-term objective of this work is to **develop autologous regenerative therapies that may one day allow a patient's own preserved follicles to serve as a source for future treatment**. These approaches remain investigational and are not yet established clinical therapies.