MicroPulse® P3

“Cyclophotocoagulation” -

A Burst of Good News for those with Glaucoma

There is a new type of minimally invasive glaucoma surgery (MIGS) that has quietly joined the fray in the battle against glaucoma: MicroPulse® P3 “Cyclophotocoagulation” (or “MP3”).
Laser Cyclophotocoagulation Surgery For Glaucoma

Most surgical glaucoma treatments work by making it easier for fluid to leave the eye. Cyclophotocoagulation (CP) takes a different approach. It works by decreasing the production of aqueous fluid. Aqueous fluid is produced by finger-like projections of tissue hidden behind the iris. These are called the ciliary processes. If these ciliary processes are damaged then less fluid is produced. Less fluid production should result in a lower eye pressure (IOP).
What is MicroPulse® P3 “Cyclophotocoagulation”? 

Traditional methods of cyclophotocoagulation burn the ciliary body. MicroPulse® P3 “Cyclophotocoagulation”, however, uses a slow application of laser energy that is “chopped” into micropulses (or, bursts). Each pulse heats up, but does not burn or destroy eye tissue. In between each pulse is a pause. This pause allows the eye tissue to cool off. In this manner the eye tissue is changed rather than destroyed.

Repetitive short pulses permit tissue to cool between pulses and reduce thermal buildup.

So, if MicroPulse® P3 “Cyclophotocoagulation” is not destroying ciliary body tissue then how does it work? The short answer is that no one really knows. With more traditional forms of cyclophotocoagulation used to treat glaucoma, the ciliary body tissue must be destroyed in order to obtain an intraocular pressure (IOP) lowering effect.
How Well Does MicroPulse® “Cyclophotocoagulation” Work?

**Short answer:** quite well for the majority of those who have this glaucoma laser surgery.

**Longer answer:** There are now multiple studies that have looked at the IOP reducing effects of MP3. To date, however, there are no longer term (2+ years) results available for general review.

In 2010 results were published documenting the beneficial effect on “refractory glaucoma”. Refractory glaucoma is essentially glaucoma that has not been controlled by any traditional methods of IOP reduction (drops, laser, or surgery including trabeculectomy and “tubes”). This type of glaucoma, as indicated by its name, just does not respond well to treatment. Yet one and a half years out from MicroPulse® P3
“Cyclophotocoagulation” the patients in this study experienced an average drop in IOP of 33% and had (on average) reduced their medication use by almost half (2.1 to 1.3 drops).¹

**NUHS Prospective Clinical Study¹**

- 33% IOP reduction at 18 months, (N = 38 patients)
- 61% med reduction (2.1±1.1 to 1.3±1.0)

More recently, unpublished results of a study performed by Drs. Jessica Maslin and Robert Noecker were presented that further supported the IOP lowering benefit of MicroPulse® P3 “Cyclophotocoagulation” (MP3). In their study of 45 patients with glaucoma, MP3 successfully lowered the IOP by an average of 42% (28.1 mmHg —> 16.4 mmHg) one year after surgery!
What are the Risks of MicroPulse® P3 “Cyclophotocoagulation”? 

Traditional Glaucoma Laser Cyclophotocoagulation has been associated with two main risks: inflammation and hyptotony (an IOP that is too low). Both of these risks can result in loss of vision. This is one of the reasons traditional cyclophotocoagulation is not more commonly recommended. However, because MicroPulse® P3 “Cyclophotocoagulation” (MP3) does not burn or destroy tissue it should not cause significant inflammation.

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The results of a study comparing MicroPulse® P3 “Cyclophotocoagulation” with continuous (traditional) cyclophotocoagulation were published in 2015.² Of 24 patients undergoing MP3, none (0%) experienced prolonged hyptotony compared to 5 of 24 (21%) who underwent continuous cyclophotocoagulation. Yet both types of laser glaucoma treatment (MP3 and continuous) were effective at lowering IOP by an average of 45% eighteen months after surgery. Additionally, only minimal inflammation was seen with MP3.
There is one other risk that must be mentioned with any newly FDA-approved glaucoma surgery: insurance coverage. Fortunately, as MicroPulse® P3 is based on a procedure that has been around for decades, it is generally reimbursed by commercial insurances and Medicare without hassle. This makes it unique among minimally-invasive glaucoma surgeries (MIGS).

**MP3 Treatment Technique** - Non-Incisional, Repeatable, Predictable

What is it like to have MicroPulse® P3 “Cyclophotocoagulation”?  

MicroPulse® P3 “Cyclophotocoagulation” can be performed in either an office or surgery center. Although there can be some discomfort during the laser application, the procedure is generally not painful. However, unlike other glaucoma laser procedures (such as laser trabeculoplasty), MP3 requires more than just topical anesthetic drops in order to minimize discomfort. Either a local anesthetic “block” (injection around the eye) or intravenous (IV) sedation can be used to achieve adequate comfort during the procedure.

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MicroPulse® P3 “Cyclophotocoagulation” is done while in the supine (lying on back) position. Unlike other glaucoma surgeries this procedure can be done even if someone has difficulty lying all the way back due to neck, spine, or breathing difficulty. As such, it is an ideal glaucoma surgery for those with significant medical conditions such as congestive heart failure.

Because there are no incisions (cuts) made in the eye during MicroPulse® P3 “Cyclophotocoagulation” there is no need for sterile draping of the eye.
As such, MP3 glaucoma laser surgery is also a **good option for anyone who is claustrophobic.**

Once adequate anesthesia has been obtained and one is comfortably lying on his or her back, the eyelids are moved out of the way with either a lid speculum or the surgeon’s gloved fingers. The MP3 laser probe is then gently guided along two semi-circular patterns around the front of the eye just beyond where the cornea meets the sclera (white part of the eye). The probe is passed back and forth multiple times. The entire surgery takes only a few minutes.

After surgery the eye may be a little sore. Generally this is mild enough that it can be relieved with acetaminophen or anti-inflammatory eye drops. If IV anesthesia was used then one can expect to be a bit groggy the afternoon of surgery (plan on napping). By the next day, however, most everyone who has chosen MP3 is without significant discomfort or pain.

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The eye may also be red after MP3 glaucoma surgery. This is because delicate blood vessels on the surface of the eye may bleed just from the
movement of the laser probe along the surface of the eye (especially in those who are taking blood thinners). This “sub-conjunctival hemorrhage” is only of cosmetic concern and will resolve on its own within a week or two of surgery.

Unlike many glaucoma surgeries, there are no restrictions on one’s activities after MicroPulse® P3 “Cyclophotocoagulation”. Nonetheless, it may be prudent to avoid heavy lifting for at least a few days after surgery.

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Your surgeon will likely want to see you in his or her office within the first week after surgery. Your IOP may or may not be lower at this first post-operative visit. By one to three months after MP3, however, IOP lowering should be observed. If the IOP is still elevated then a second treatment may be necessary to achieve a reduction in IOP.
What does MicroPulse® P3 “Cyclophotocoagulation” (MP3) Cost?

For costs or inquiries, please send an email to: david@new-glaucoma-treatments.com

MicroPulse TSCPC delivers repetitive, low-energy laser ‘micropulses’ which reduce risks associated with other destructive therapies.
Summary

The combination of IOP lowering benefit, low risk profile, and likely reimbursement by commercial insurances and Medicare makes MicroPulse® P3 “Cyclophotocoagulation” a good option for almost all patients with glaucoma who fit into any of the following categories:

- Those with poorly controlled IOP despite using all available glaucoma medications
- Those who have difficulty tolerating glaucoma medications
- Those who have difficulty affording their glaucoma medications
- Those who have difficulty regularly taking their glaucoma medications
- Those who have already had Laser Trabeculolplasty
- Those who are physically unable to tolerate more extensive glaucoma surgery

Given the above list, it’s apparent that almost anyone with glaucoma could benefit from MicroPulse® P3 “Cyclophotocoagulation”.
References:


Notes
David Richardson, M.D. is widely recognized as one of the most respected Ophthalmologists in California and is among an elite group of glaucoma surgeons in the country performing the highly specialized canaloplasty procedure. Moreover, Dr. Richardson is one of only a few surgeons in the greater Los Angeles area that performs Micropulse® “Cyclophotocoagulation” (MP3) glaucoma laser surgery. Dr. Richardson is also an Adjunct Assistant Professor of Clinical Ophthalmology at Keck School of Medicine of USC. He is accepting new patients at his private ophthalmology practice in San Marino, CA.

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