# DECIDING WHICH MICRODERMABRASION TECHNOLOGY IS RIGHT FOR YOUR BUSINESS

There are a number of types of systems on the market: crystal, crystal-free (diamond-tip), vibrating paddles, hydro-systems, plasma and rotating brushes. The oldest technology is the rotating brush (metal wire brushes on a controller much like a Dremel tool which delivers a very bloody treatment) and is labeled as dermabrasion. The crystal machines first came on the U.S. market in 1997 under the "microdermabrasion" label because it uses micro-crystals in a treatment that is pretty much precision sandblasting of the skin. When crystal-free machines were introduced to the market, around 2000 or 2001, the companies promoting those systems were falsely telling everyone that crystals were dangerous; they caused Alzheimer's, a lung disease and other respiratory problems. All of that has been disproved and those companies, for the most part, have stopped making such false claims, but some people still have the belief that crystals can cause health problems. Other technologies were introduced along the way and all have claimed to be the replacement for the previous technology. The truth is, the choice of which technology to purchase is just a matter of personal preference. This information is provided solely to help you learn the difference from one technology to the other.

One important fact you need to know is that there has never been, and never will be, a clinical study on all the microdermabrasion technologies, comparing results from one manufacturer to another and from one technology to another. Some companies will claim that they did a comparison but it is impossible to say how fairly those treatments were evaluated. We can assure you there is no way you could get all the manufacturers to donate equipment and money into a research situation where their machine could end up on the bottom of a published list.

Your goal is to build your aesthetic business and, in terms of microdermabrasion treatments, establish a satisfied clientele who will regularly come in for their treatment and refer their family and friends. How you achieve this is by delivering a consistent, effective exfoliation that can be easily and accurately reproduced. There can be no guesswork or approximation. You must be able to accurately gauge the treatment power each time you use it so you can make adjustments to the following treatment based on prior results. Here is the difference between one technology to the next.

**Rotating Brush** - This is an old technology that has been resurrected. We have not spoken with anyone who owns the most recent version of this technology, but you can be certain that the pressure the operator can apply with their hand will have a dramatic effect on the treatment outcome. If an operator applies varying pressure from one treatment to the other, not to mention from one region of a patient's face to the other, they will have a difficult time reproducing the treatments and building that repeat clientele. The system does utilize vacuum pressure, more like a vacuum cleaner, to collect the skin debris that is produced during the treatment. It may be somewhat difficult to keep the handset sealed on the skin, with the brush mechanism in the middle of the handset, to effectively collect all the skin debris. Even with the vacuum pressure, the rotating brush will tend to scatter particles. If a medical treatment is attempted, collecting the fluids/blood that is produced during the treatment is highly unlikely, again, due to the rotating brush and the natural forces involved with that rotation and the scattering of particles. Using a system that incorporates vacuum pressure precludes it from being used on patients with vascular issues like broken capillaries or rosacea because vacuum pressure will tend to make those conditions worse. This system also claims to "infuse" a solution into the skin, which is highly improbable due to the presence of vacuum pressure (see Hydro systems below).

**Plasma** - This was a technology that hit the market in approximately 2003 and didn't take off. We do not know anyone who owns this system.

**Hydro** - This technology came out in approximately 2002 and there are only a few manufacturers that we are aware of at this time. A very interesting technique of exfoliation and, if you listened to the salespeople selling it, it will take over the market and replace all others. Of the spas we are aware that have them; some like it (but they still have other, non-hydro, microdermabrasion systems they also use in their office) and some are not happy (as proof, you can find these machines on the used market). After a number of years, it hasn't taken over the market and doesn't look like it will. The reasons why are two-fold: the treatment is the most expensive to deliver (cost to the operator/owner) and the claims made by the manufacturer have no clinical (or at least, questionable) results backing them up. The high cost per treatment is because the system uses a fluid (hylaronic acid, salicylic acid and hydroquinone) along with the abrasion of the skin performed by scrubbing the skin against a rough surface or a rotating brush. The fluid is introduced into the handset, and onto the skin, by vacuum pressure. This vacuum pressure is drawing all debris away from the skin. The vacuum picks up almost 99% of the fluid and deposits it in the waste canister, resulting in a large waste of money in terms of supplies. The company implies that the system will "infuse" the solution into the dermis but that is physically impossible since the major force created by the machine (vacuum) pulls everything away from the skin; there is no force driving the solution into the dermis, which is the only place where it can be of any value. The system requires a considerable amount of cleaning post treatment; the operator must clean all the residual solution from the system or it will cause damage, resulting in costly repairs. It is also a very overpriced piece of equipment. You would get the same results, at a fraction of the cost, if you were to perform an abrasion treatment with any one of the other technologies and then apply the solution of your choice with a cotton ball directly to the patient's skin. This system uses vacuum, so patients with vascular issues should not be treated. It has the capability to effectively collect skin debris so, in this category, it is a safe technology.

**Vibrating Paddle** - This technology has been on the market since about 2004 or so. The system has vibrating paddles that have an abrasive material, not much different than sandpaper, on one side. The paddles come in different sizes and shapes to fit the various areas of the face and body. The system can be adjusted in terms of the speed of vibration and the paddles have different grades of abrasiveness. Also, due to the vibrations that act similarly to an ultrasound system, any topicals you apply can be pushed farther into the skin. The downside to the paddle system is; 1) The paddles do not fit all areas of the face very well, 2) The manufacturer recommends that you treat each area for so many minutes so determining just how deep you have gone in each section (or in one particular spot) is an approximation, 3) The operator can vary the amount of pressure they apply with their hand so the treatment will be inconsistent, and 4) The abrasion may be deeper in areas where there is bone backing up the skin (compared to areas where there is no bone behind the skin). This technology is an excellent option for exfoliation of the body. You would use a new set of paddles for each patient, so your cost per treatment would be high for a single treatment, but will go down for each subsequent treatment since you can reuse the paddles on the same patient. At some point the paddles' abrasiveness is reduced and it must be discarded. The cost for a set of paddles varies from one manufacturer to the next. Since it does not use vacuum, this system is safe to use on patients with vascular issues. This system has no skin debris collection capabilities whatsoever, so exposure to the health risks of ingesting the skin debris is a major consideration.

**Crystal Free or Diamond Tip** - As mentioned earlier, the companies that promote these types of systems first came on the market with false information to scare buyers away from crystal

machines and into buying theirs. In the event you or your employees are uncertain about the safety of crystals, we will list the false rumors, an explanation of the truth, and how you can research the points yourself. A crystal free/diamond tip system is comprised of a vacuum motor that draws air in through a handset which is a hollow metal tube. One end of this metal tube handset has the vacuum hose attached (leading to the vacuum motor) and the other end of the tube has an abrasive material affixed to the end or edges of the tube. The operator moves the handset across the skin, scrubbing the skin with the abrasive material. The vacuum pulls the skin up against the abrasive material and, along with the pressure the operator will apply with the weight of their hand, dictates the depth of the abrasion. Just like the vibrating paddle system, the depth of the abrasion will vary based on the pressure applied to the handset by the operator's hand and also by the fact the abrasion will be deeper on skin that is backed by a bone structure. Because the pressure being applied by the operator's hand will alter the treatment outcome, and the operator cannot possibly apply the same amount of pressure all the time and the same from one treatment to the next, treatments with this type of machine will be inconsistent. The handsets are expensive and are meant to be re-used on different patients. The health concerns with this system are multiple: 1) there is no way to remove all the skin particles from the crevices in the abrasive material so using it on different patients is questionable, 2) when using the most abrasive handset on bone-backed areas, the treatment will produce fine cuts in the skin, and 3) the vacuum will not pick up all the skin being abraded so the treatment area (floor, countertops, bed, etc.) will accumulate skin particles from every patient and the operator will be exposed to ingesting these potentially unhealthy contaminates. The positive aspect of this technology is that it doesn't use crystals, which will accumulate on your treatment room surfaces, just like the skin particles. Deciding between a crystal and a crystal-free system will be a matter of choice that comes down to one thing: do you want to have to clean the excess crystals from your treatment area? You will have to clean your treatment areas to remove the skin particles left behind with the crystal-free system (and for general cleanliness reasons), so cleaning your work area is a process that will be required no matter what technology you choose. The crystal supplies are a cost to consider, but the crystal-free systems handset will wear out, will require replacement and the cost for a handset is high. The cost per treatment may not be very different when all things are considered. The crystal-free system uses vacuum so it is not suitable for patients with vascular issues.

**Crystal Machines** - These systems utilize many forms of crystals, primarily aluminum oxide, sodium bicarbonate or sodium chloride. Some will use walnut shells or other materials. Aluminum Oxide is second only to diamonds in terms of hardness, has a high amount of mass per particle and has relatively sharp edges so it is ideal for the treatment. All other crystal forms listed above are softer and lighter than aluminum oxide so they are less effective. A well designed crystal machine is very consistent in terms of the depth of the abrasion since it does not rely on the operator’s hand pressure, which will vary from stroke to stroke. That is the most noticeable difference between a crystal machine and the non-crystal versions: the machine controls the abrasion. A machine will be far more consistent and measurable than a human being. If a crystal machine is designed properly, the gauge will accurately measure the treatment power, deliver consistent results every time and provide reproducible results. If the system can utilize more than just aluminum oxide crystals, it can deliver both aesthetic and medical treatments. Performing a medical scar revision treatment may involve an open wound and the operator should choose a crystal that will dissolve so they will not generate granulomas from foreign particles embedded in the tissue (aluminum oxide will not dissolve, sodium bicarbonate will dissolve). A system with a sealed canister reduces the risk of operator exposure to health concerns. The downside to a crystal machine is the potential mess the crystals could make, but that will vary between manufacturers, with some machines creating very little excess crystals. The crystal system requires supplies so the cost per treatment is

something to consider, but if the system does not use an excessive amount of crystals per treatment, that cost can be reasonable. It is also a vacuum system so patients with vascular issues cannot be treated. However, it has been proven that the vacuum pressure (used by the hydro, crystal-free and crystal systems) will generate collagen and elastic by increasing the circulation in the dermis, causing fibroblast activity, which is part of the process of collagen and elastin production. Some crystal machines have the option to turn off the crystals to perform a vacuum treatment (called aspiration) which allows the operator to vastly improve the treatment outcome.

**Here are the negative rumors about crystals generated by the crystal-free manufacturers:**

**Causes Alzheimer's** - Aluminum Oxide is a natural material, taken from the earth. It is a sapphire or ruby without color. Aluminum Oxide is made up of two molecules of Aluminum combined with three molecules of Oxygen, is inert and requires a large amount of energy to separate the Aluminum from the Oxygen molecules (you cannot "create" aluminum during a microdermabrasion treatment). Dentists utilize a polish for teeth that contains aluminum oxide. Ask your dentist about the different pastes they use that contain aluminum oxide or go online and do a search for yourself on dental supply companies

.

**Breathing the dust causes a lung disease** - Regarding the false claims made by the crystal-free companies, you only have to examine the physics of the crystal machine to see through their misleading statements. A microdermabrasion system utilizes vacuum pressure to drive the crystals to the skin in a closed loop design. The crystals do not mobilize until the handset is in contact with the patient's skin, closing the loop and sealing the crystals from reaching the outside air. A crystal machine performs a sandblasting treatment so the crystals involved in this procedure must have some mass (weight) in order for the particles to hit the skin with enough force to have an effect. Those particles are relatively heavy and cannot float in the air so ingesting them is improbable. A crystal machine will not create or emit dust from its handset; it is not possible in this type of design. Any powder or dust that is present in the clean crystal supply container will never make it to the skin of the patient or the outside air. If there is any powder, the vacuum pressure of the system will pick it up and it will always end up in the system's waste container since those particles do not have the mass to even reach the skin. The crystals that are left behind during the treatment will have some weight to them, will not float in the air and will not be ingested by the operator or patient. The only exposure to the powder an operator could have is if their system requires them to empty the waste container by dumping the dirty crystals and skin debris into a trash bin. That will create a cloud of dust that could be ingested by the person who is emptying the waste container.

The biggest health concern you, as an operator, should have is the exposure to skin particles. As the skin is abraded, the cells will become detached from the patient and, in the case of small particles, possibly float in the air around the treatment area. Ingesting these particles could expose you to various health issues based on the health condition of your patients. How the system collects the skin debris is a very important factor to consider in your choice of technology. It is interesting how the crystal-free manufacturers got established in the marketplace by falsely claiming crystals were dangerous, when their technology exposes the operator to a potentially more unhealthy situation because most crystal-free units do not effectively collect skin debris.

There have been some studies, one published in the American Journal of Industrial Medicine, citing a very small number of cases of lung problems caused from breathing dust containing aluminum oxide and metal particles. None of them involve microdermabrasion or any other

medical, aesthetic or dental procedure. These studies are covering industrial abrasive work, mostly sandblasting of heavy industrial equipment (that is where the metal particles come from). The study did not specify which type of particle (metal or aluminum oxide) found in the patient's lungs that caused the patient's health problem. Companies who recite these reports as evidence of a major health concern are blowing the situation way out of proportion. The MSDS (Material Data Safety Sheets, required by OSHA to notify the public about hazardous materials) on aluminum oxide state that it is a lung irritant. There are MSDSs on aluminum oxide printed in the 1970s, far before microdermabrasion came to the U.S. These were originally published to notify the miners, auto body-work technicians sanding cars/vehicles and other people performing industrial jobs involving aluminum oxide, about the risk of extensive exposure and the recommendation to wear breathing apparatus/filters. We are talking about exposure to large amounts of the dust on a regular basis as part of the job. Microdermabrasion machines that use crystals are a closed loop system and do not emit dust because the "sandblasting" occurs in a closed chamber that collects all the lightweight waste products (any dust that is involved, skin debris, oils, most crystal particles, etc.). As an operator of a microdermabrasion system, of any type including the crystal free, you should wear a mask. This is not to protect you from the dust of a crystal machine, but from the skin particles that you will be dislodging from your patients. A crystal machine, because it is a closed loop system, will pick up about 90-95% of the skin particles. A crystal free machine will pick up about 30-40% of the skin it dislodges. The vibrating paddle system does not collect any of the skin particles. Check online for MSDS on aluminum oxide and it will tell you it is a lung irritant but nothing about using it for microdermabrasion or other medical treatments. If you look hard enough, you will find the article in the American Journal of Industrial Medicine and you need to read it thoroughly (Volume 34, issue 2, pages 177 to 182).

**Crystals make a mess** - This is the only valid point they can bring up and this will vary from one manufacturer to another. Some machines can make a mess and leave behind a large amount of crystals. Some machines are very clean and will only leave a trace of crystals. The crystals that are left behind with any machine are not dust and will not float in the air. These crystals had to have some weight to them just to make it to the skin during the "sandblasting" treatment. They will fall onto the bed or floor and are not a breathing hazard. Regardless, you will have to clean them up. This is the only health/cleanliness factor a buyer should consider in making the choice between a crystal and non-crystal machine. Keep in mind that skin particles are not as noticeable as crystals, but are a much larger health concern, and all types of systems will leave skin particles behind. Some technologies leave behind more than others.