



Cupping Therapy

Mechanisms of Action

By Dominador Perido, MD, CCT, CCE

Cupping therapy has been practiced for thousands of years; however, many people are unaware about its benefits and how it works. Yet, the undeniable fact that the practice of cupping is gaining more avid believers proves that cupping practitioners offer a whole host of benefits.

A review done by Al-Bedha et al. (2019), intended to identify possible benefits of cupping from a modern medical outlook, offered a logical explanation for its effects. They reviewed 75 full-text articles for eligibility, and finally chose 64 in their studies. The review looks at pain reduction possibly explained by the Gate Control Theory of Pain, muscle relaxation changes

in local tissue structures, and improvements in blood flow. Improvements in blood flow are explained by nitric oxide theory and the elimination of toxins and reduction of wastes and heavy metals from the body, which are explained by blood detoxification theory. These changes

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happen at the capillary level by diffusion osmosis, oxidation reduction and other chemical changes.

How this happens, though, the reviewers reluctantly admitted, was not fully understood. How does a cup applied at the abdomen, or chest, relax the trunk and make the pelvic area, or shoulders, warm and tingly?

Looking at nitric oxide theory, nitric oxide regulates blood pressure, contributes to the immune response, controls neurotransmitters, and participates in cell differentiation and many more physiological functions. Cupping could cause release of nitric oxide from endothelial cells and hence induce certain beneficial biological changes. Studies suggest

that nitric synthesis is critical to wound collagen accumulation and acquisition of mechanical strength. Blood vessels in cupped areas are dilated by release of vasodilators such as adenosine, noradrenaline and histamine, which leads to increased blood circulation.

Placement of a cup on the body is not the sole factor of importance. Wang et al. (2020) studied the effects of pressure and duration of cupping on skin blood flow response. Measurement on skin blood flow was done on the left triceps (on the Sanjiao-12 acupuncture point) using laser Doppler flowmetry and expressed as a ratio of skin blood flow after cupping compared to before cupping therapy. They found that higher values (300 mm Hg) of negative pressure compared to lower values (225 mm Hg) increased skin blood flow. Also, a shorter duration (5 minutes) caused a larger peak in total skin blood flow compared to longer duration of 10 minutes or more.

A Cupping Session

Let us now recall the steps in a cupping session. The first step is the mitigation of suction.

A cup with a suitable size is placed on the selected site, and the skin and superficial tissues then drawn inside the cup by flame, electrical or manual suction. After application to the skin, it's left for a period of several minutes. The final step is the removal of the cup and examining the area for hyperemia or swelling. (It's the aim of this article to explain the physical changes and effects on the body at the moment the cup is applied and suction initiated.)

We know the atmosphere that surrounds Earth exerts a certain amount of pressure, which measures 14.7 pounds per square inch. We also know our body exerts its own pressure when the lungs expand and the hearts pumps blood, or

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the muscle contracts. This pressure measures 14.7 psi at sea level. It gets less at higher altitude and increases as we go deeper into the ocean. It is the equilibrium between the

atmospheric pressure and the pressure of the body that we live our daily lives, unaware of the changes in our environments and in our bodies.

Poiseuille's Law

But, when a cup is placed on the body and suction applied by flame, electrical or manual means, we immediately notice that portion of skin and subcutaneous tissue fill the inside of the cup where atmospheric pressure is diminished or taken out altogether. Here is where a law of physics takes over—Poiseuille's law, which states that the velocity of a fluid through a narrow tube (as a blood vessel, or a catheter) varies directly as the pressure and the fourth power of the radius of the tube and inversely as the length of the tube and the coefficient of viscosity.

In other words, the more pressure and the wider the tube, the faster the flow. The longer the tube and

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the more viscous the fluid, the slower the flow.

Charles's Law


The movement of the cup brings another law of physics into place: Charles's law. The volume of gas is directly proportional to its temperature. So, as the pressure and temperature of the blood increases, its velocity also increases. The blood rushes to the capillaries, carrying with it different cells and chemical substances that help normalize the patient's functional state and progressive muscle relaxation.

According to Abdullah et al. (2019), the improvement in skin micro-circulation removes noxious materials from the skin and interstitial compartments. It has


been found that cupping increases red blood cells. It has been claimed that cupping therapy also tends to drain excess fluids and toxins, loosen adhesions and revitalize connective tissues, increase blood flow to the skin and muscles, stimulate the peripheral nervous system, reduce pain, control high blood pressure and modulate the immune system. There is also significant reduction in blood sugar in diabetic patients after cupping.

Overall, cupping is reported to effect changes in the biomechanical properties of the skin, increase immediate pain thresholds in patients with neck pain and in a healthy subject, as well as reduce significant peripheral and local P-substance, and reduce inflammation.

In summary, the cups' effects on the most minute and distal circulation helps the body to relax and renew itself by giving it oxygen and energy rich blood and getting rid of toxins and waste products. It is achieved by simple changes in atmospheric and tissue pressure following the basic laws of physics like Charles's law and the law of Poiseuille.

Editor's note: *MASSAGE Magazine's editorial guidelines necessitate presenting the terms cupping, cup, cups and cupping therapy all in lowercase. The International Cupping Therapy Association, on whose behalf the author wrote this article, uses the presentation of Cupping, Cup, Cups and Cupping Therapy.* 

Dominador Perido, MD, CCT, CCE, is a board-certified general surgeon who practiced in the southwest corner of Kansas for over 40 years. He had his surgical residency at St. Vincent's Medical Center in Staten Island, New York, from 1971 to 1975 and moved to Elkhart, Kansas, immediately after residency. After seeing failures in surgery and orthopedics, he discovered the overwhelming benefits of cupping and acupuncture. Perido is a cupping educator for the International Cupping Therapy Association (cuppingtherapy.org).

 Read "Unusual Effects of Cupping and Vacuum Therapies," "Expert Insights on Cupping" and "Cupping the Geriatric Client," along with other articles on cupping, on massagemag.com.



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