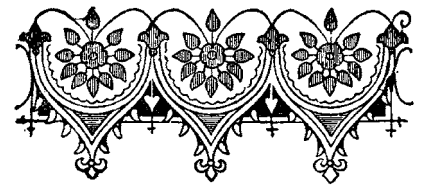


# Health & Wellness



## Improving Circulation Fundamental to Your Health



Dr. Kate Thomsen and Silky

Benjamin Franklin said there were only two things certain in life: death and taxes. I would like to add two more: nutrition and elimination. Everybody must eat food and use the bathroom. Most of us believe we are doing this effectively every day. What is actually happening between the eating and the elimination?

The purpose of eating is to feed your 30 trillion body cells. Your body cells are factories designed to manufacture specific proteins. These proteins produce all the structures and functions of the body. You eat turkey this month because some of the nutrients in turkey meat are used by your brain cells to make messenger chemicals that cause you to feel happy and relaxed. Everything you are and do is a product of the way your cells are functioning. And the function of your cells depends on what you feed them. But there is more to this story. After you spend all that money and time on deliciously prepared organic food, don't you want to know those nutrients are getting into your cells?

Getting nutrients into cells depends on breaking up the whole foods with chewing, stomach acid and digestive enzymes. These broken up small nutrients must move across the intestinal wall and into the blood stream known as the circulation. The "circulatory system" is a body-wide highway - a transport system that brings nutrients to the cells. There are various ways that nutrients can enter the cells from the circulation - from diffusing through the cell membrane to being carried in by larger molecules. It all takes work, using body energy, which is why we tend to feel tired a short while after eating a meal.

Just imagine if your body-wide transport system, the cir-

ulation, is not efficient? What if there are cells desperate to be fed but the nutrients can't get there? There could be traffic jams or places where the speed limits are too low for effective movement of this fluid system. Despite your healthy diet, you have put your body's health at risk. Cells will die. Sounds like we need to know more and care more about this circulation.

The circulatory system is composed of the heart, blood vessels and blood. The blood is the red fluid that flows through the blood vessels. It is red because it contains red blood cells (and white blood cells and platelets and nutrients...). 84% of your 30 trillion body cells are red blood cells. They must be pretty important!!! Red blood cells carry oxygen from the lungs to the cells. The heart pumps the blood carrying these red blood cells and nutrients through blood vessels called arteries. Like the branches of a tree these arteries split into smaller and smaller branches until they become capillaries. This is where the nutrients, gases like oxygen, and messengers like hormones gain access to each individual cell. A different branch of the capillaries then pick up waste products and carbon dioxide from the cells. These "carry away" branches become bigger and bigger eventually becoming the veins you are familiar with. The venous blood eventually goes through the lungs, picks up oxygen, moves into the heart and is pumped around again. These arteries and veins (the macrocirculation) and capillaries (microcirculation) make up one single unified system of vessels. Ah, the Magnificence!!!

Laying out your arteries, capillaries and veins end-to-end would cover 60,000 miles!!! That distance would wrap around the earth 2 1/2 times!! (Those who have seen "Body Worlds" can believe this.) This transport system is vital to our health allowing the cells to get the oxygen and nutrients they need and dispose of the carbon dioxide and wastes they do not need. This is the ultimate purpose of our "nutrition and elimination" practices. We need this circulatory

system to function with great efficacy. Ideally it should take less than a minute for the blood to make a round trip to and from the heart.

At any one point in time 12% of the blood is in your arteries, 14% in your veins and 74% in your capillaries. The capillary microcirculation is vast in order to be in close proximity to each of your cells, allowing nutrition and elimination at the cell level. The little capillaries are 1/10 the diameter of a human hair and the red blood cells squeeze through them in single file, handing out nutrients and oxygen or picking up carbon dioxide and waste products as they pass the individual cells. Just think what would happen if this microcirculation was impaired or the flow was reduced?

Microcirculation can be slowed from having thickened or more viscous blood, from the buildup of fatty plaque or buildup of toxins (heavy metals, free radical damage...) in the vessels. It becomes impaired in persons with high blood sugar (diabetes) and high blood pressure. It also can be slowed with very low blood pressure, significant dehydration or blood loss. Localized blood flow can be impaired when the body has experienced trauma from injury or surgery. In these situations the interconnecting tissues like the fascia can become restricted. This fascia forms the framework for nerves and blood vessels to travel through. Localized impaired microcirculation may cause pain and possibly permanent damage to those cells that are dying of starvation - think heart attack, cold hands and feet, vision problems, numbness/neuropathy, and even the brain fog and memory problems we are all complaining of. Optimal microcirculation is needed to feed the cells of our intestines so that they can afford us the proper digestion and absorption of nutrients which will be delivered (through the microcirculation) to the other body cells. No matter how healthy your food intake is, the health of your microcirculation will determine how healthy your individual cells are.

I recently attended an international conference on

**Kate Thomsen MD, MPH**  
INTEGRATIVE AND HOLISTIC HEALTH  
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microcirculation. Researchers discussed how much we know about the macrocirculation (the flow in the arteries and veins). We have medications to control blood pressure and can give fluids to control blood volume. But ultimately, people can suffer or die from lack of adequate microcirculation - even if they have good macrocirculation. Researchers are excited by the emerging interest in the microcirculation because of both its importance and also its mystery. You see, no one knows what is controlling the microcirculation. What is making those tiny flexible vessels rhythmically change diameter to facilitate motion of the blood fluids and exchange of gases and nutrients? No one knows - yet. But they do know that certain low dose PEMF (pulsed electromagnetic field) devices can positively affect the microcirculation. Low level magnetic fields (less than 25 - 65 microteslas, the magnetic fields of the surface of the earth) are considered safe. PEMF low dose magnetic fields

carry signals that can affect body cells' natural electrical charges. Devices carry different signals with different health benefits and efficacy. Research has shown positive effects using PEMF for pain, bone healing, sleep, depression and balancing the autonomic nervous system. Aerospace engineers have found positive effects using PEMF for tissue repair and correction of some adverse health effects astronauts experience while living without gravity. Seems like many of these positive health effects may be coming from the healing effects of improved microcirculation.

*Dr. Kate Thomsen's office for holistic health care is located in Pennington, NJ. She is board certified in Family Medicine, certified in Integrative/Holistic Medicine, and an Institute for Functional Medicine Certified Practitioner. She has been practicing Functional Medicine for over 15 years. For more information see [www.drkatethomsen.com](http://www.drkatethomsen.com) or call the office at 609-818-9700.*