

Meridians: Understanding the Science (Pt. 1)

Mark Reinhard, BSEE, LAc / EAMP

What the meridians are has been a bone of contention among researchers for some time. Anatomical studies have not revealed any unique or distinct structures to the meridians, although there have been some claims to the contrary.

The most revealing area of research has come from Drs. Darras and DeVernejoul in France.¹ They injected a radioactive tracer dye (Technitium-99) into an acupuncture point (they started with LV 3), then into a nearby blood vessel, and then into a nearby lymph duct to see where the dye went and what the differences might be. It turned out each was distinctly different, and the dye injected into the acupuncture point traced out the traditional path of the meridian that point was on!

You can "see" the meridians on the gamma camera pictures or CT scan. They could only trace the meridians in the arms and legs, but not into the trunk, since the channels dive deeper in the trunk and the radiation is absorbed by the tissues.

Systems at Work

Two conclusions can be drawn from this: 1) The meridians take advantage of existing biological structures; 2) They are associated with the circulation of extracellular fluid. These are significant findings in several ways.

Most importantly, extracellular fluid is the medium of exchange of nutrients and waste products between the inside of the individual cells and outside the cells. This circulation must be effective for the cells to function properly.

In Western medicine, it is thought that this circulation is mediated solely by the lymphatic system. Drs. Darras and DeVernejoul's research proves there is a second system that assists the lymphatic system in its work.

Since the lymphatic system's fluids are circulated mainly by the mechanical pumping action of physical activity (which is one reason exercise and stretching, such as yoga, are so good for you), the acupuncture meridians can best be thought of as assisting in the circulation of extracellular fluid, especially during periods of rest and inactivity. This correlates with the TCM concept that the *qi* of the meridians moistens and nourishes the tissues of the body.

So, think of the acupuncture meridians as consisting of the spaces between the cells (only about 5 microns by 15 microns in size) organized into channels or pathways. Not that the meridians are that small. Looking at the pictures of the meridians, it is obvious that the extracellular fluid is traveling up a larger pathway.

Needle Placement

That is nice to know because it means needle placement does not have to be that precise – at least when trying to influence that flow. However, I have seen the meridians show up from both needling

(quite rare) and from a *qi gong* master directing his *qi*. They both looked as if someone took a magic marker and drew it. It was only about an 1/8th inch wide then. It may be the difference between an electrical phenomenon (the skinnier one) and an extracellular fluid phenomenon.

They were both red, though (needle and *qi gong* master). I don't know how this phenomenon works. I just can report that I have seen it twice. Looking at the pictures, we probably have 1/4- to 3/4-inch-wide meridians (if not wider).

Now for the autonomic effects. We still need to get adequate *qi*, which usually means stimulating the parasympathetic nerves deeper in the muscle. That may require more exact placement of the needle. But to influence the circulation of extracellular fluid, we have a little more leeway. They also take advantage of "seams" between muscle groupings, as a careful review of where the meridians are suggests. This can also explain why you can get pain from major traumas or surgeries, especially when the damage crosses the meridians. If as a part of the trauma or healing (like surgery), the meridians aren't lined up properly, the ability of the affected cells to get proper nourishment or get rid of their wastes is impaired. That can result in pain or disruption of normal function.

It can be thought of as a blockage in TCM. That is why needling a scar can sometimes help. I have found that doing electroacupuncture along the channels affected works well. This is probably because the electric field helps cause the walls of the channels to line up in the direction of the field.

I have also noticed that if this circulation is impaired in muscles, it will usually result in achy pain (kind of like the achy pain you get from overexertion, which causes a build-up of lactic acid in the tissues). If nerve tissue is affected, it usually results in burning pain instead.

"External Pathogens"?

There are other aspects of their research which are equally revealing. For one, the dye always migrates from the periphery toward the center of the body. I asked them about this at a symposium I attended in the mid '80s and they said the dye was an "external pathogen" and according to TCM, "external pathogens" always travel from the peripheral to the center of the body (the heart).

Well, if the meridians are associated with the circulation of extracellular fluid (lymphatic fluid), then indeed that flow will eventually return to the heart, where it mixes again with the blood to continue its journey throughout the body. It doesn't have anything to do with being an "external pathogen," but more to do with how extracellular fluid circulates.

To be fair, the lymphatic system does have a significant role to play in the workings of our immune system. And external pathogens can travel deeper into the body through this circulation system (such as cancer cells migrating to other parts of the body through the lymphatic or blood circulation systems).

Even the problems doctors sometimes have when injecting Botox into the face can be readily understood by realizing that if you inject Botox into an acupuncture meridian, it will migrate along the channel and can then influence the tissues along the channel's path (such as the tongue or throat when using Botox in the face and injecting it into the LI or ST channels). Do doctors understand this? Of course not. And likely neither did you until now.

Editor's Note: This article is excerpted from Mark's book, *Electro-Acupuncture for Practitioners*. It has been formatted to meet our style and publication guidelines. Part 2 is scheduled for publication in the April issue; and part 3 for the May issue.

Reference

1. *Energy Fields in Medicine: A Study of Device Technology Based on Acupuncture Meridians and Chi Energy*. (Compiled by Morton M and Dlouhy C. The John E. Fetzer Foundation, 1989.

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