

The Heart is not a Pump

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Abstract: Contrary to the information presented in anatomy textbooks, the heart's function is far more than a mechanical pump. This article describes why the heart cannot be a pump, and speculates about its real function based on findings from embryology, Polarity Therapy, Craniosacral Therapy, Polyvagal Theory, Attachment Theory and other sources. The article concludes that the heart is the body's primary energy field regulator and a portal into the deep meaning and purpose of human consciousness. An experimental therapeutic protocol for working with the heart, based on these findings, is proposed.

Look up "circulatory system" or "heart" in any textbook and the first sentence is likely to describe the heart as a pump that pushes blood through the arteries, capillaries and veins to deliver oxygen- and nutrient-rich blood and evacuate waste products to and from the tissues of the body.¹

However even a basic analysis of the mechanical requirements for this function lead to the conclusion that this is not possible. Numerous experts² have pointed out the problem, to no avail. The pump description prevails against overwhelming evidence to the contrary.

1. Examples:

Heart: 1. A hollow muscular organ of vertebrate animals that by its rhythmic contraction acts as a force pump maintaining the circulation of the blood. –Webster's New Collegiate Dictionary
"Blood flows through separate pulmonary and systemic circuits, driven by the pumping action of the heart." –Fundamentals of Anatomy and Physiology, Martini, p. 682

"Movement and beating of the heart are the only cause for the circulation of blood through the body." –William Harvey, 1628

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What a commentary on modern culture's coexisting knowledge and ignorance, that so basic a situation is so misunderstood.

Evidence that the heart is not a pump

Significant problems with the "heart is a pump" model include:

-Not nearly enough force is applied to accomplish the task. Moving a viscous fluid through more than 40,000 km of vessels requires a pushing force much greater than the measurable 1.5 watts exerted by the heart; to move the blood a force strong enough to lift 4,000 tons one meter annually has been estimated.³

-A pump works efficiently with a closed system. But the entire non-corpuscular volume of the blood is replaced 80 times each day. With this "leakage," the return flow in the veins is entirely unexplained since there would be no fluid pressure left after the capillaries that open into the tissues. Furthermore, there is more blood volume in the veins than the arteries, by a wide (65% to 12%) margin; an efficient pump design would operate on the larger volume directly.

-The relationship between flow and pressure is opposite what would be expected if the heart was a pump, with highest pressure and lowest volume throughout the system (including the veins) when the heart's pumping action is highest. However, the volume of blood and venous pressure increase when the heart's pumping action weakens.

-The aorta bends under systole, when it should straighten under the higher pressure.

-Heart problems and circulatory problems do not necessarily coincide.

-Replacement by a mechanical pump only works for a time.

-The location of the heart in the upper third of the body makes no sense if efficient pumping action is the functional goal; ask any farmer whether to put a pump

2. As one example:

"Nowhere else in nature or in mechanics is manifested such a miracle of a pump the size of the owner's fist to circulate a semi-heavy fluid through miles and miles of the finest vessels and tubes, as the heart is supposed to do." –Stone, Polarity Therapy, Vol II, Bk 4, p. 30.

3. Schauberger, Living Energies, p. 192.

"Modern analysis of the heart has shown that in spite of the fact that the most powerful ventricle of the heart can shoot water six feet into the air, the amount of pressure actually needed to force the blood through the entire length of the body's blood vessels would have to be able to lift a one hundred pound weight one mile high. The heart is simply incapable of producing the pressure actually needed to circulate the blood." (Buhner, p. 75)

at the top (suction action) or bottom (push action) of a hill.

If not the heart, what moves the blood?

The cells and tissues of the body are churning engines of metabolic activity, taking in and expelling materials to accomplish their tasks of growth, replacement, energy conversion, mobility and defense. To find a force capable of moving the blood through the circulatory system, the capillary side of the equation is a far better candidate. In effect, each cell is microscopically pulsating and replacing the blood constantly. This is the consensus explanation for the real force behind circulation in the body. All the evidence supports this explanation, as many writers have discussed.⁴

Viktor Schauberger offers additional insights: the spiral shape on the inner surface of the blood vessels, the temperature differential between core and extremities, and the electromagnetic charge differential

4. Examples:

“The force that causes the blood to flow into the heart is the result of work performed by the tissues continually replenishing the fluid volume of the blood... The function of the heart is to regulate resistance.” –Holdrege, The Dynamic Heart & Circulation, p. 70 ff

“Osmotic pressure, in the form of the production of water from food and oxygen, is the pump... The heart does not pump, what it does is listen. This amazing organ senses what is in the blood and then calls forth the necessary hormones so that homeostasis is maintained and the cells can function optimally... The heart is not a mechanical pump but actually a sensitive integrator of all our experience.” –Cowan, The Fourfold Path to Healing.

5. Schauberger, Living Energies, p. 188-190.

between arterial (oxygen-rich) and venous (CO2-rich) blood also seem to support circulatory action.⁵

If not a pump, what is the heart’s primary function?

At a mechanical level, the heart’s rhythmic beating attracts first attention. The forceful expulsion of the blood sets a basic cadence for bodily functioning, and forceful delivery of blood to the nearby (and appropriately uphill) brain is a cornerstone of health. The cadence itself is the subject of inquiry, serving as a sort of metronome to which many other functions orient.⁶

But a greater interest arises as the inquiry turns to more subtle levels.

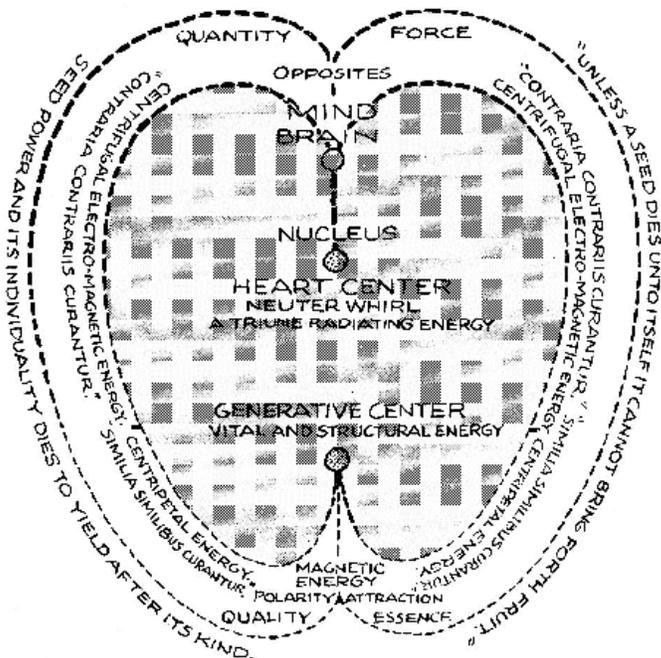
The hypothesis for this article is: the true function of the heart is to regulate the polarity action (cycles of inward and outward pulsation) of the primary energy field of the body. Furthermore, this polarity action is the foundation of physical, emotional and psychological well-being, therefore the heart’s role is a central, perhaps the central, esoteric function at the foundation of health.

For Dr. Randolph Stone, DO, DC, ND (1890-1981), founder of Polarity Therapy, the true meaning of the heart was its dynamic management of inward and outward reciprocal action in the whole system.⁷ This view is presented in one of Dr. Stone’s most famous charts (Illustration 1, below). Because the polarized cycle of expansion and contraction is the fundamental engine

6. “Our heart is the metronome of our body’s biorhythm and health happens when we are in rhythm with ourselves, synchronized with other living systems, and moving to our pre-set beat.” –Pearsall, Heart’s Code, p. 222)

“The outward and inward currents must move in all fields if there is to be health and happiness... The heart center is the pivot for the circulation of these energies through the blood... and becomes the control center for these energies.”

–Polarity Therapy, Vol I, Bk 3, p. 36



“The heart wave is the body’s master wave that reflects and organizes the degree of synchronization of all behavioral waves from those of the whole organism through molecular biological and genetic oscillations.” – Irving Dardik, “The Origin of Disease and Health Heart Waves,” Cycles Magazine, Vol. 46, #3, 1996.

7. “The outward and inward currents must move in all fields if there is to be health and happiness... The heart center is the pivot for the circulation of these energies through the blood... and becomes the control center for these energies.” – Stone, Polarity Therapy, Vol I, Bk 3, p. 36.

for all phenomena, the “glue of the universe,”⁸ the heart’s activity can be characterized as the subtle basis for all health. This is well-understood in the popular mind, but perhaps lagging in real acceptance in medicine and science.⁹

Compelling confirmation of the heart’s esoteric properties comes from the literature relating to heart transplant recipients and research by HeartMath Institute.¹⁰ Many other resources also explore this topic thoroughly; use the footnotes in this article as a starting bibliography.

The arising of the early heart in the embryo offers additional possible insights into its subtle function. This theme has been beautifully developed in anthroposophical literature inspired by Rudolph Steiner and others (see bibliography). The progenitor of the heart appears as a horseshoe shape of specialized cells at the cranial end of the primitive streak, as if to catch the streak’s directional impulse (a key gesture of the soul’s incarnation) and pivot the energetic signal back towards its source. Thus the heart is a metaphor at least for the experience of self-awareness that is a central feature of human consciousness.

8. Zukav, *The Dancing Wu-Li Masters*, p. 206.

9. “It’s just a stupid pump!” –Transplant recipient Claire Sylvia’s cardiologist, reported in her book *A Change of Heart*.

10. www.nexusmagazine.com/articles/CellularMemories.html has excellent accounts of transplant phenomena. For HeartMath Institute, see www.heartmath.org.

Following this line of thinking, the heart might be considered the first and foremost instrument for self-awareness in the body. This identity of the heart suggests the key attribute of the ether chakra or fifth element. The heart’s migration past and fascial connection to the throat via the pericardium also supports this link to the ether chakra.

The heart also shows the earliest formal expression of meso-tissue in the body, energetically the neutral principle in complement to the yang ectodermal (central nervous system) and yin endodermal (digestive) factors. This idea of the heart as the key neutral organ matches Stone’s ideas of it being the pivot between outward (yang) and inward (yin) expressions. The firm attachment to the respiratory diaphragm, the energetic midpoint in the body, also supports this interpretation. Stone highlighted this relationship with one of his more famous statements, “When the diaphragm is free, the heart is free, to act without fear or apprehension” (Stone, *Polarity Therapy Vol. II*, p. 46).

Experimental Protocol

Polarity Therapy strategies for working with the heart (see Illustration 2, below) are interesting and effective in their respective ways, but do not much mention the primary underlying heart function described by Stone. These methods seem to be primarily about relieving symptoms of various heart problems. Based on the hypothesis and using a combination of descriptions of the heart field and its operations, we

Polarity Therapy Heart Strategies

1- Phrenic Nerve (II, 4, 13, f 1)

2- Scapula release (I, 2, 36; II, 4, 7, f 1)

3- Contacts on hands and feet
 thumb webs- bi-lateral (I, 2, 17, f 1 & 2; EES, 6)
 Intermetacarpals- bi-lateral (II, 4, 6, f 5)
 Intermetatarsals- bi-lateral (II, 4, 6, f 3)
 Bi-lateral fingers contacts on distal joints (II, 4, 6, f 4)
 Bi-lateral toes contacts on distal joints (II, 4, 6, f 1 & 2)

4- Diaphragm-Clavicle Lift: same & opposite sides (II, 4, 8)

5- Diaphragm-Cardiac Stability Line (II, 4, 9, f 1 & 3)

6- Diaphragm-Jaw Contacts (II, 4, 9, f 2 & 4)

7. Rt hand thumb on heart, Lt hand elsewhere (I, 3, 2, p. 36)

have been experimenting with a new heart field protocol.

To work with the heart field, a position sitting at the supine client's head is suggested, similar to the position for Polarity Therapy's "North Pole Stretch" (Stone, Polarity Therapy Vol. I, Book 2, Ch. 42). We have tried other options but this seems to work best. Placing the hands just inferior to the armpits, on the ribs, seems to work well. With a quiet listening perceptual attitude, visualize and attempt to detect a gentle slow expansion and contraction cycle that extends out about 15 feet or more into the surrounding space, and returns to pivot in the center of the thorax.

Some of the findings so far: The pacing is slower than expected, perhaps 30-60 seconds per expansion or contraction. The movement may be asymmetrical or have pauses and plateaus. One aspect may be longer than the other (i.e., expansion more than contraction), or seem to be absent altogether. It does not necessarily seem to be identical with the "long tide" rhythm of Craniosacral Therapy's "primary respiration," though this is the subject of great continuing curiosity. We have developed numerous speculations about possible interpretations of various presentations (preference for outward may relate to sympathetic nervous system, inward to parasympathetic, etc.).

Whatever you find, appreciate it! This movement is a

Heart Trivia

The Heart beats 100,000 times a day, about 3,000,000,000 or more in an 80-year lifetime. Blood circulatory volume is about 5 quarts per minute, or 2,000 gallons per day.

The capillaries total about 40,000 km in total length. If all the capillaries were laid end to end, they would cover the area of three football fields (Cowan, *The Fourfold Path to Healing*, Ch. 3 p. 4).

The healthy heart varies its rate up to 20 beats per minute throughout the day. Heart rate arises from a delicate precise balance between information provided by the heart itself, the brain, the vessels, the blood-rich organs and the capillaries. 60%-65% of the cells in the heart are neural cells, and about 70% of these are glial cells not neurons.

Heart produces 2.5 watts with each heartbeat. Electromagnetic amplitude is 40-60x that of brain waves, making the heart by far the strongest EM signal produced in the body. The EM field radiates at least 12-15 feet beyond the body; it is easily measurable at 3 feet.

Arteries and Veins are named for Yang (Ares) and Yin (Venus) mythological archetypes.

Heart, brain and planet earth all oscillate in the same 30 cps range.

About half of those who suffer their first heart attack have no risk factors (high cholesterol, obesity, smoking, high blood pressure) (Pearsall, p. 36). Overwhelming evidence points to life experience (love, stress, etc.) as the primary factor.

The progenitor of the heart (neutral principle) appears on day 17 of embryonic development, one day earlier than the liver (yin principle) or central nervous system (yang principle). The blood (extraembryonic mesoderm in the trophoblast) is considered to be the very first "organ," appearing about day 12.

fundamental expression of how the client manages his or her life experience, so there are no pathologies. Appreciation and gratitude, indeed outright admiration, seem to be the heart's native language.

Follow the movement for several minutes, acknowledging and reflecting whatever happens. It may show a certain pattern for a while, then go into stillness and later resume in a different configuration, or there may be results elsewhere in the physical or emotional dimensions. The blueprint level (social autonomic nervous system fully enabled) expression would be a symmetrical, graceful, smooth cycle of full range of motion.

Bibliography

- Blechsmidt, The Ontogenetic Basis of Human Anatomy. North Atlantic, Berkeley, CA, 2004.
- Bolk Instituut. Bolk's Companions (4 volumes). Louis Bolk Insitute, Amsterdam, 2001.
- Buhner, Stephen Harrod. The Secret Teachings of Plants: The Intelligence of the Heart in the Direct Perception of Nature. Bear & Co., Rochester VT, 2004.
- Childre, D and Martin, H. The HeartMath Solution. Harper Collins, New York, 1999.
- Coats, Callum. Living Energies; Viktor Schauberg's brilliant work with natural energy explained. Gateway Books, Bath, UK, 1996.
- Cowan, MD, Thomas. The Fourfold Path to Healing. www.fourfoldhealing.com.
- Grossinger, PhD, Richard. Embryos, Galaxies and Sentient Beings. North Atlantic, Berkeley, CA, 2003
- Holdrege, Craig. The Dynamic heart and Circulation. AWSNA, Fair Oaks, CA. 2002.
- Lewin, Roger. Making Waves: Irving Dardik and His Superwave Principle. Rodale Press, Philadelphia, PA, 2005.
- Pearsall, MD, Paul. Heart's Code. Broadway Books, new York, 1998.
- Stone, DO, DC, ND, Randolph. Polarity Therapy (2 volumes). CRCS, Sebastopol, CA, 1986.
- Sylvia, Claire. A Change of Heart. Warner Books, New York, 1997.
- van der Wal, MD, PhD, Jaap. The Speech of the Embryo (DVD lecture). CSES, Boulder CO, 2005.
- van der Bies, G. and Huber, M. (editors) Foundations of Anthroposophical Medicine. Anthroposophical Press, 1995.
- Verhulst, Jos. Developmental Dynamics. Adonis Science Books, New York, 1999.

