

Piezoelectricity and the Piezo Pen



Piezoelectric and the Piezo Pen

Introduction

The discovery of piezoelectricity

The many Uses of piezoelectricity

Going green with piezoelectricity

Electricity and behind as therapy

Analogy of the therapy

Basics of the piezo pen

How and when to use the piezo pen

Piezo pen protocols

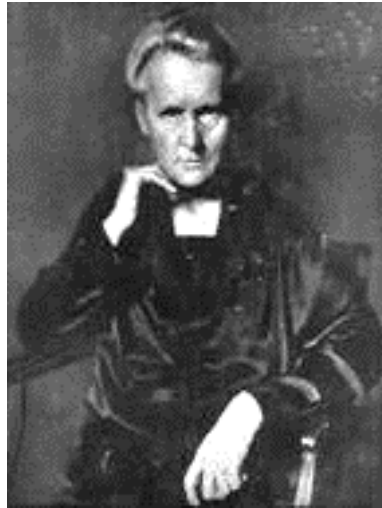
Introduction to Piezoelectricity

We should have a good working knowledge of what piezoelectricity is and how we can best use it to service our patients. To do this I will first layout a reasonable connection between piezoelectric and acupuncture Point theory.

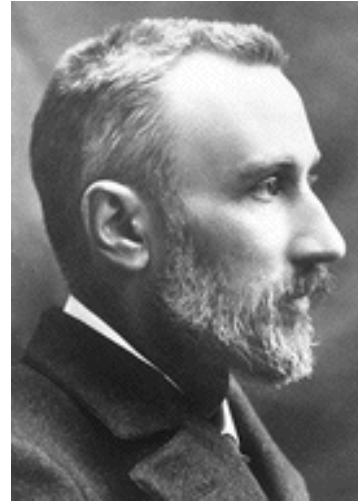
To fully grasp the idea of piezoelectricity as a therapy it's essential we understand the concept of electric conductivity of the acupuncture points.

This is the key foundation to successful implementing of piezoelectric into your practice. It will also help service you when you inform your patients of this remarkable therapy.

The Discovery of Piezoelectricity



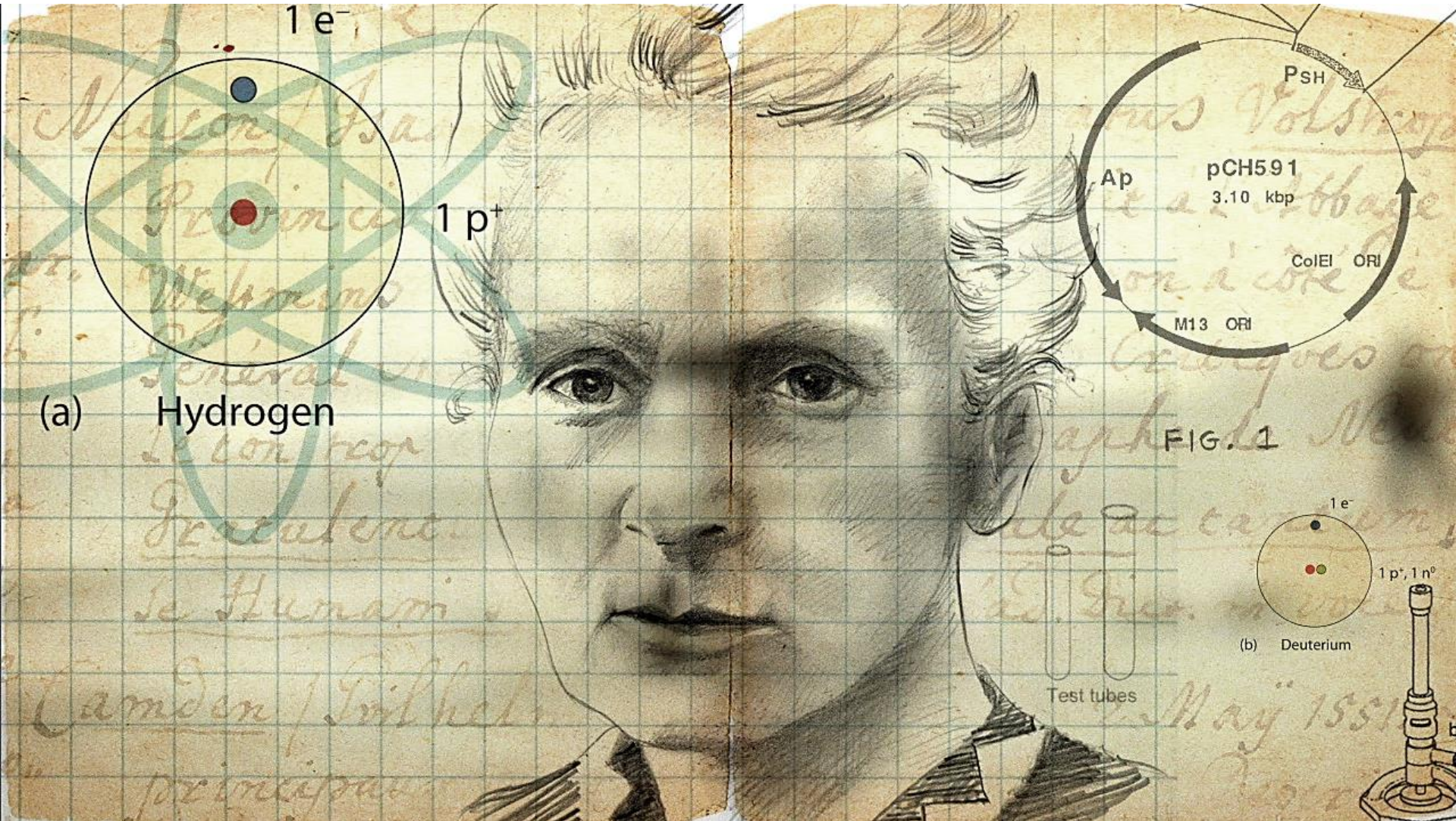
Jacques Curie (1856 –1941)



**Pierre Curie (1859-1906)
Nobel Prize in Physics, 1903**

Piezoelectricity was discovered in 1880 by French physicists Jacques and Pierre Curie. The word Piezo (pie zoe) is derived from the Greek word for “pressure.” The French brothers Jacques and Pierre Curie discovered that pressure applied to a quartz crystal created an electrical charge. This was called the “Piezo Effect.”

The Noble Prize Family



Marie Curie (Pierre Curie wife) is only one of two people to ever win two Nobel Prizes in different fields (physics 1903, chemistry 1911)

Mathematics

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Underwater Communication (Sonar)



In 1917, P. Langevin and his French co-workers made a transducer that was a mosaic of thin quartz crystals glued between two steel plates (the composite having a resonant frequency of about 50 KHz). Today we know this as sonar. piezoelectricity is discharged, acoustic wave is bounced off the ocean floor. The wave than bounces back to vessel with data on what the acoustic wave picked up.


The First Commercial uses of Piezoelectricity



The second-generation applications with piezoelectric (1940 – 1965) saw its first commercial use. In 1951 the Japanese successfully tested the world's first fish-finder. This was the first of many commercial uses of piezoelectricity. Today you can find piezoelectricity in use from the hospital or to city sidewalks just to name a few. More information on these uses coming.

Paris, the City of Piezoelectricity



The 37th running of the Paris marathon saw Kenya's  Peter Some run to victory in a time of 2:05:35 (4:47 per mile). Peter and his fellow 37,000 runners took part in a truly historic event. As the runners approached the finish line the course was covered with 176 special tiles, these tiles generated electricity as the runners ran over them.

Running = Piezoelectricity



The 2013 edition of the Paris Marathon lived up to its nickname, the “city of lights”. 176 special piezo tiles lined the final 25 meters of the Paris race. When the 38690 runners in the race ran over the piezo mats it generated a total of 4.7 kilowatt-hours of energy.

Piezoelectricity By the Numbers



4.7 watts of energy will power the following (time); a 5-watt LED light for 940 hours. If the entire course was lined with this mats it would have powered that 5-watt light for 181 years, or 1,585,560 hours

Piezoelectricity Floor Generating Tiles



This piezo electric street tiles are made in the UK. The body of the tiles is made of recycled polymer materials. While the surface of the tiles are made from recycled truck tires.

I ♥ NY



New York City's Time Square sidewalk gets roughly 350,000 pedestrians every day, equal to around 650 million steps per day. Multiplying this by the number of steps total for one day and then for one year, the amount of energy produced for one year is 1,105GJ. This is equal to about 307,000 kWh per year of electricity produced. Installing these tiles would save NYC \$46,042 per year. Unfortunately, each tile costs well over \$100 per tile. Needing around 236,000 of them, it would cost upwards of \$23 million dollars for the tiles.

Structural Health Monitoring



Piezoelectricity is used in (SHM), where the integrity of mechanical structures (such as an air plane) is checked while in use. This is highly relevant where safety is an important issue e.g. transport structures, infrastructure and building structures

Piezoelectricity is All Around Us

You can find piezoelectricity in air bag sensor, audible alarms, keyless door entry, seat belt buzzers, knock sensors, Disc drives, inkjet printers Cigarette lighters, depth finders, fish finders, sonar, humidifiers, jewelry cleaners, musical instruments, speakers, telephones Disposable patient monitors, fetal heart monitors, ultrasonic imaging. Depth sounders, guidance systems, hydrophones, guitar pick-ups, smoke detectors, alarms etc..

Piezoelectricity and the Piezo Pen

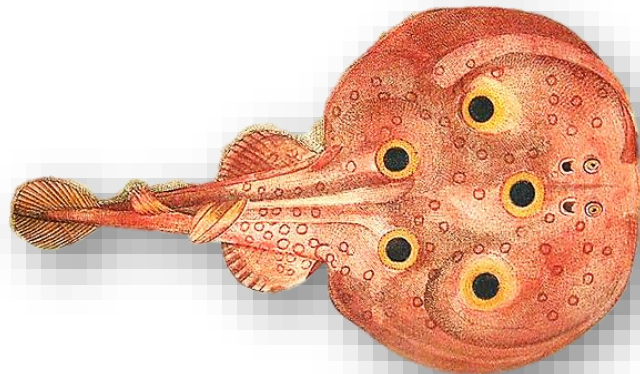
Now that we understand the concepts and discovery of piezoelectricity we can now proceed. knowing the many practical uses of piezoelectricity will aide us in using this natural energy as a form of therapy.

Before we get to the piezo pen protocols, I must first lay the groundwork that will allow us to properly and safely use it on our patients. This knowledge will also help to service well when your patients question you about the therapy.

This line of therapy is not suited for everyone, I will discuss this in detail in the up coming pages

Electricity as a Medical Treatment

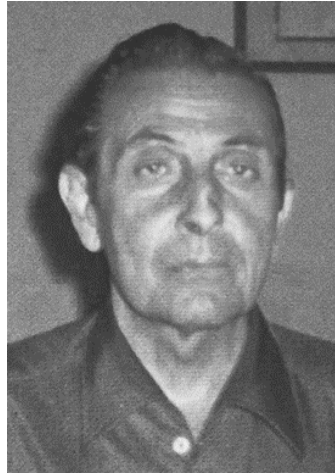
Rudimentary forms of electricity have been used as medical treatments by ancient Greeks and Egyptians physicians with a family of electric rays known as Torpediniformes.



Torpedo Fish (Electric ray)

Piezoelectricity is a new discovery dating back to 1880. Though it's fairly new, piezoelectricity can be observed today in use from sidewalks to the most modern operating rooms in the world, to just name a few of its uses.

Enter Jacques Niboyet



Jacques-Emile Henri Niboyet, M.D. (1913-1986)

The French doctor, Jacques-Emile Henri Niboyet Pioneer's work on the electrically conductive acupuncture points helped give creditability to the practice of acupuncture.

Niboyet used a sensitive instrument known as a galvanometer to detect and measure the electric current of the skin. During his experiments Niboyet noticed a difference in the skin over acupuncture point versus the surrounding skin. He observed that the skin over acupuncture points had a significantly lower electrical resistance than the surrounding skin.

Confirmation of Niboyet's Work



Pierre Rabischong



Jean Bossy (1929-2009)

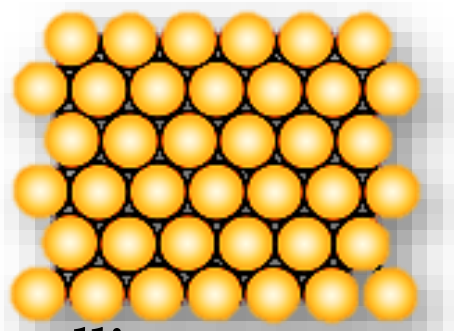
Rabischong and Bossy separately reproduced Niboyet's studies in 1975 and found that Points of lowered electrical resistance could be identified in fresh or embalmed cadavers, But not on completely dry cadavers. In moist cadavers preserved in glycerin, an Electrical detectors using a one square-millimeter contact reacted at acupuncture points Located on all regions of the body's surface. Bossy's studies suggested that transmission Of acupuncture electrical activity is not entirely dependent on an intact nervous system, and That moisture and electrolytes appear to be necessary vectors for transmission of electricity Between the points.

By Mechanical or Mental (stress) Stimuli

There are receptor connections between the outside and inside of the cell, linking to signaling pathways that convey mechanical stimuli information to the nucleus. Receptors are able to convert mechanical energy into chemical stimuli that can be conducted inside the cell. Past soft tissue articles in this journal have given evidence of pressure on tendons causing a proliferation of fibroblasts and initiation of an inflammatory cascade, resulting in the laying down of new collagen along the normal lines of stress. An often-overlooked benefit of soft tissue loading is the piezoelectric effect. Stress in the body produced by mechanical or mental stimuli will create piezoelectricity.

Human Tissue and Piezoelectricity

Proteins, nucleic acids and mucopolysaccharides, which compose all living tissue in the human body, exhibit piezoelectric properties. This piezoelectric induced current activates the healing processes in the stimulated area. Thus, this mechanically induced electrical energy has great regulatory effect on the cellular and molecular levels.



Crystalline arrangement

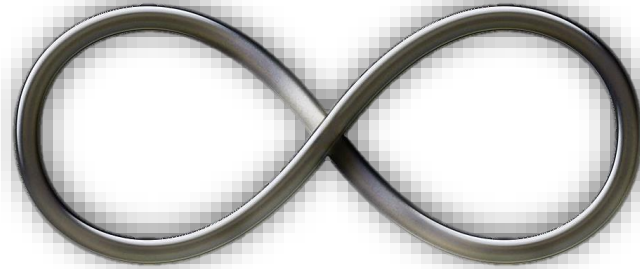
Crystalline arrangements are the rule in living tissue, not the exception. These crystals are piezoelectric, meaning they generate electric fields when compressed or stretched. When a bone or cartilage is compressed, or a tendon or ligament stretched, or when skin is stretched, electric pulsations are created.

My (*A·nal·o·gy*) of the Piezo Pen

How does the piezo pen work? I have no scientific proof as to how it works, nor could I find any one who did. After seeing it work many times in my option its more then chance, coincidence or placebo. My analogy (***definition***; comparison between two things, typically based on their structure and for the purpose of explanation or clarification) draws off two facts.

First, acupuncture points have a significantly lower electrical resistance then the surrounding skin (Niboyet 1956). Second, piezoelectricity is natural produced in our bodies. It's with these to ideas that I base my analogy as a possible means to the piezo pens results as a therapy.

A (unknown) World of Endless Possibilities



The Piezo pen is growing in popularity among acupuncturist who treat patients that are needle phobic or just don't want needles. Unfortunately, there are not many articles or classes out there that teach you how and when to use the piezo pen. We can thank Takeyoshi Yamaguchi, MD of Japan for invention this phenomenal device

The goal of my is to help explain what piezoelectricity is and how it can help us, even if we are not a wear of it.

Procced with Causation

The practitioner (you) are part of the treatment. By touching the patient you will make a complete closed electorol circuit. Both you and your patients will feel the electorol correct. It feels the same as when you slide over a carpet and touch a metal object.

If you are energy sensitive?, Does you watch ever stop working, do you effect machines around i.e. computers. Do you wear crystals? Do you have more then 3 cats in your apartment? Have you ever caused a plane to crash? If you answered yes to any of these questions Then yes you are energy sensitive, Do not preform this technique.

If your patient are energy sensitive, they will tell you. If they are Do not use the piezo pen on them. If any one of the parties in this treatment is it will scatter there qi

Piezo Pen Basics

Important Considerations - *Is the patient a good candidate*

Clinical Application - *How to properly use the piezo pen*

Benefits - *What can the piezo pen treat*

Voltage and current - *Piezo pen discharges 6000 volts of electricity*

Waveform characteristics - *Delivers a chaotic wave pattern*

Safety Reliability - *The piezo pen is a medical device and should
ONLY be used for this purpose*

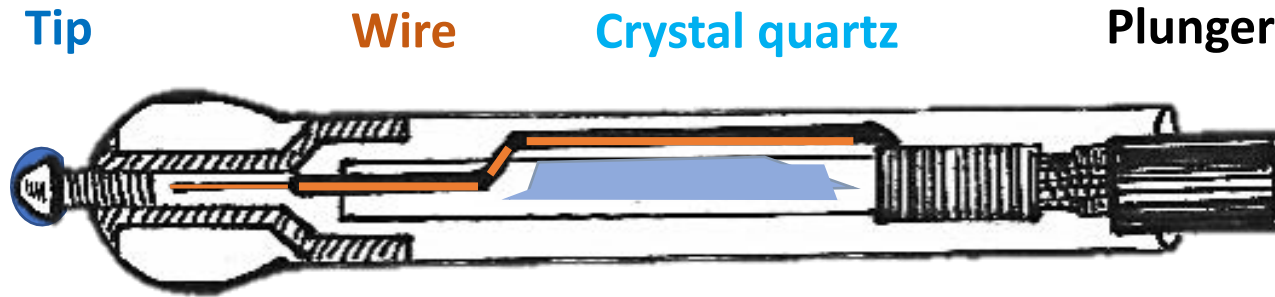
Piezo Pen Basics

Patients who have the following conditions should not be treated with the piezo pen implanted electronic devices, e.g. a pacemaker, insulin pump, or women who are pregnant.

The Piezo pen can last up to 10 years if it is properly cared for. Do not click the piezo pen in the air. Always make sure it is touching skin. If not, it will wear the crystal down very quickly.

Quartz Crystal (the crystal inside the piezo pen) is the second most abundant mineral found within the Earth's continental crust.

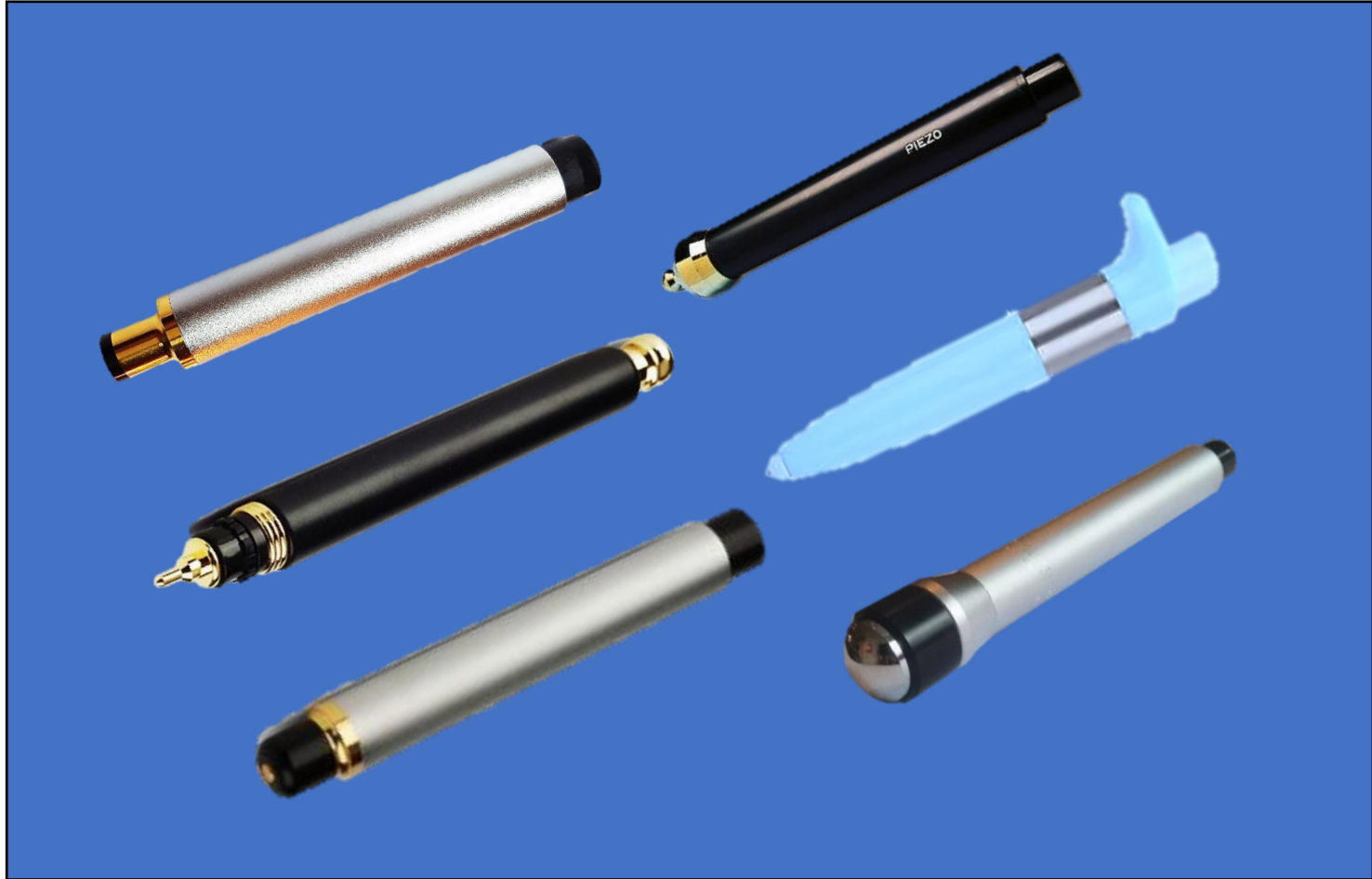
Anatomy of the Piezo Pen



When piezoelectricity is administered via a piezo pen. Each click of the plunger will send a stimulation lasting about a $1/10^{\text{th}}$ of a second. Every click of the piezo pen produces about 6000 volts with very little amp ridge with a chaotic wave pattern.

Clicking the plunger of the Piezo pen creates pressure that travels down the cylinder of the pen. This pressure passes over the crystal quartz causing a piezoelectric current. The current is transferred down the pen via a wire to the tip of the piezo pen.

Piezo Pens Come in Different Styles



How to Hold the Piezo Pen



Hold the piezo Pen in one hand with your thumb on the plunger at the back end of the pen. With your other hand place your index finger on the acupuncture point of your patient that you are treating, or the desired location you are going to treat.

Make sure your index finger or the piezo pen are touching the patient's skin. If any part of your finger/body or pen is touching any article of your clothes or your patient this will lessen the piezo effect

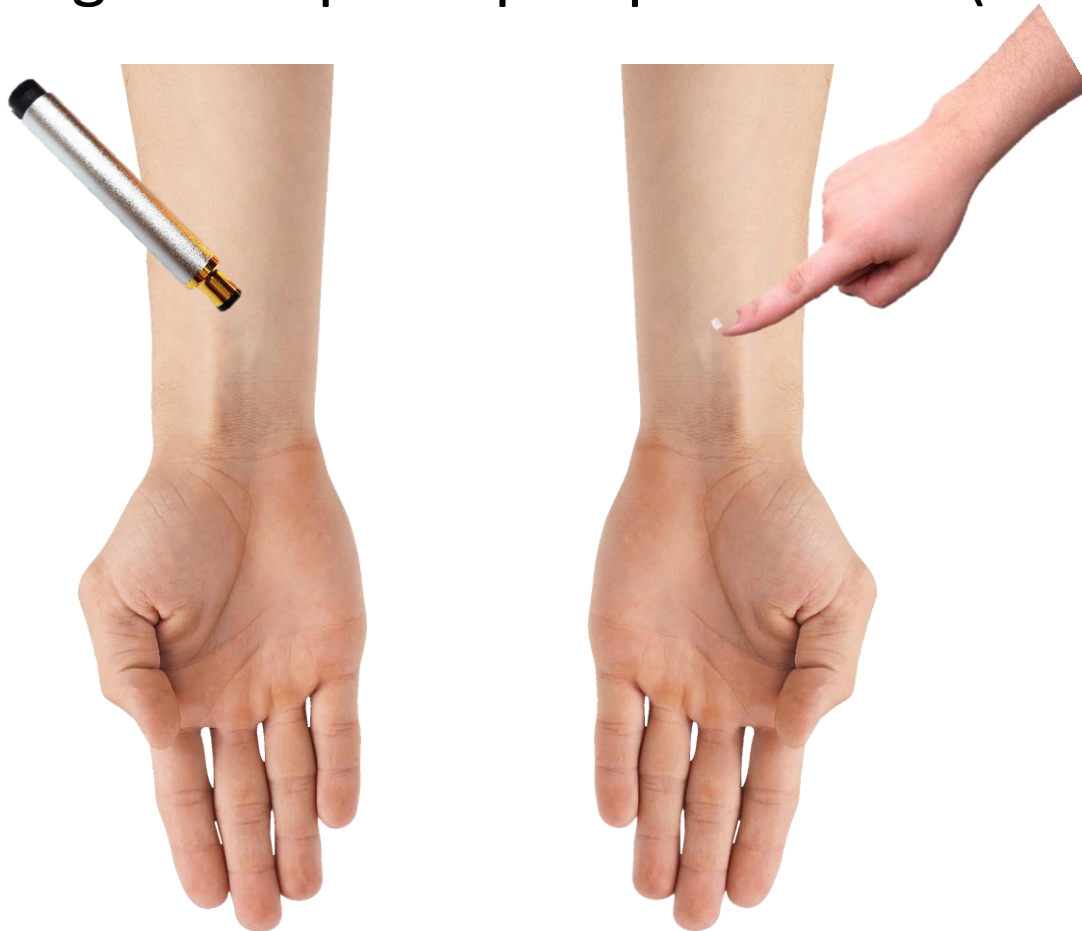
Nausea and Vomiting



The piezo pen can be used successfully in the treatment of many medical conditions. Here are two piezo pen techniques for treating nausea and vomiting (motion sickness and for patients who are undergoing chemotherapy) with acupoint PC6.

Nei Guan Pericardium 6 (PC6)

Motion sickness treatment. Click the piezo pen 10 to 15 times then switch finger and piezo pen placement (see next page)



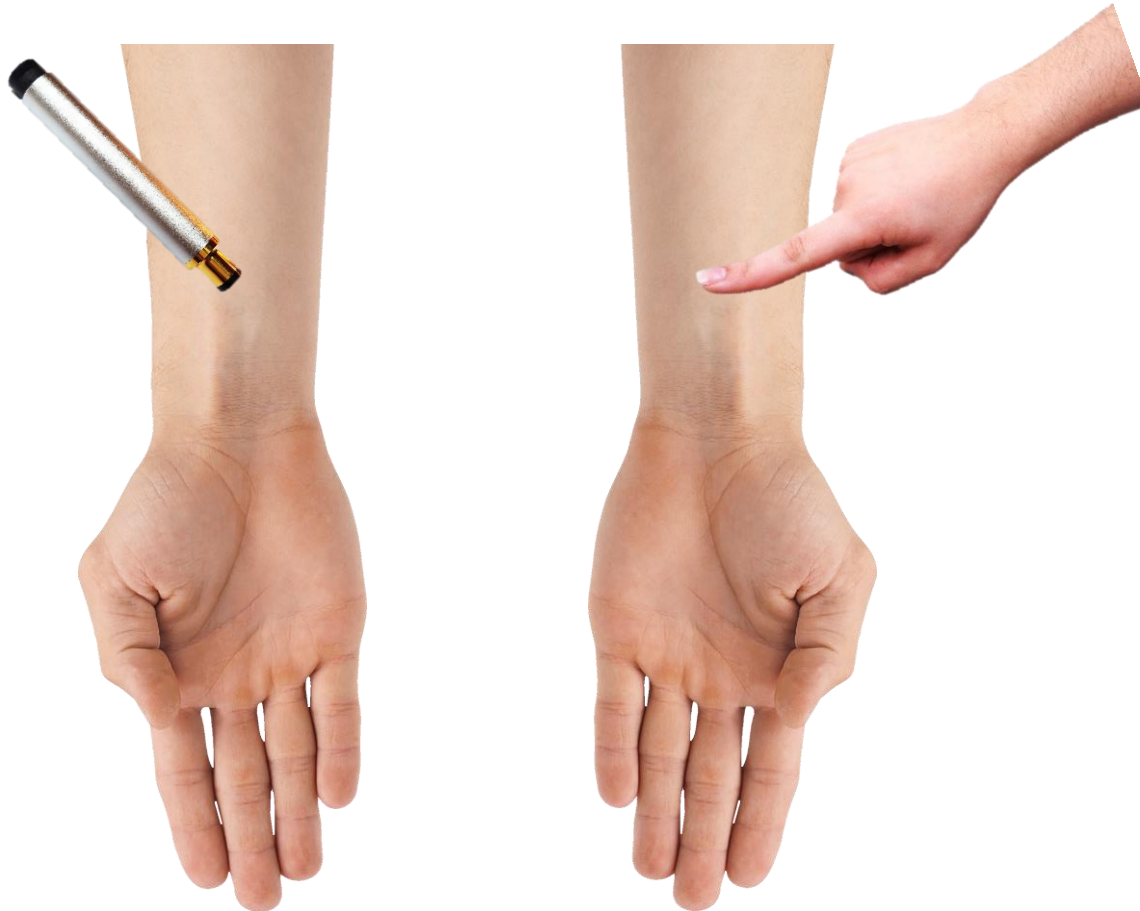
Nei Guan Pericardium 6 (PC6)

Motion sickness treatment. Click the piezo pen 10 to 15 times. Repeat as needed, can be repeated 20 times per day



Nei Guan Pericardium 6 (PC6)

Chemotherapy treatment. Click the piezo pen, for 30 seconds then switch finger and piezo pen placement (see next page)



Nei Guan Pericardium 6 (PC6)

Chemotherapy treatment, 30 second of piezo pen clicks.
Repeat as needed, can be repeated 20 times per day



The use of Piezoelectricity for Rapid Increase of Milk for Insufficient Lactation



~By~

John Howard, L.Ac., Dipl, Ac

Stephanie Lashmit AAS

Combining 2 Forms of Ancient Healing



Electrotherapy (from the Romans) and Acupuncture (from the Chinese).



Both electrotherapy (standing on electric fish/eels) and acupuncture treatments have been used for centuries to treat many different medical conditions.

Roman Women Standing on A Torpedo Fish



Electrotherapy



Torpedo fish above

Scribonius Largus, a Roman physician, recorded the use of torpedo fish for treatment of headaches and gout in his *Compositiones Medicae* of 46 AD. ancient Greeks used electric rays to numb the pain of childbirth and operations.

Electrotherapy / Piezoelectricity



In 1880 two French physicists Jacques and Pierre Curie discovered piezoelectricity



The word piezoelectricity means electricity resulting from pressure.



Piezoelectricity is a safe and effective means of electrotherapy. A Piezo pen takes the place of standing on an electric fish.

What is A Piezo Pen & How Does It Work

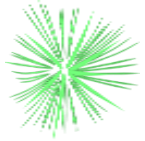


The piezoelectric stimulator (Piezo Pen) is an instrument that works by means of pressure exerted onto a quartz crystal, which results in a tiny electric charge. There is no battery or electrical source. It works with the existing living human electric fields.

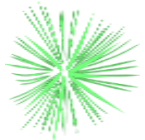


This device was studied by Japanese scientists, who were fascinated by the intimate relationship between the human body and electricity. The brain, heart, muscles, and even individual cells produce tiny amounts of electricity

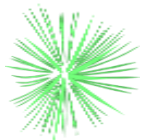
Medical Uses of Piezoelectricity



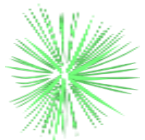
Used in surgery for a more precise cut into the desired area.



Used in dentistry for treatment of gum disease.



Used in modern day medicine to treat gallstones and infertility.

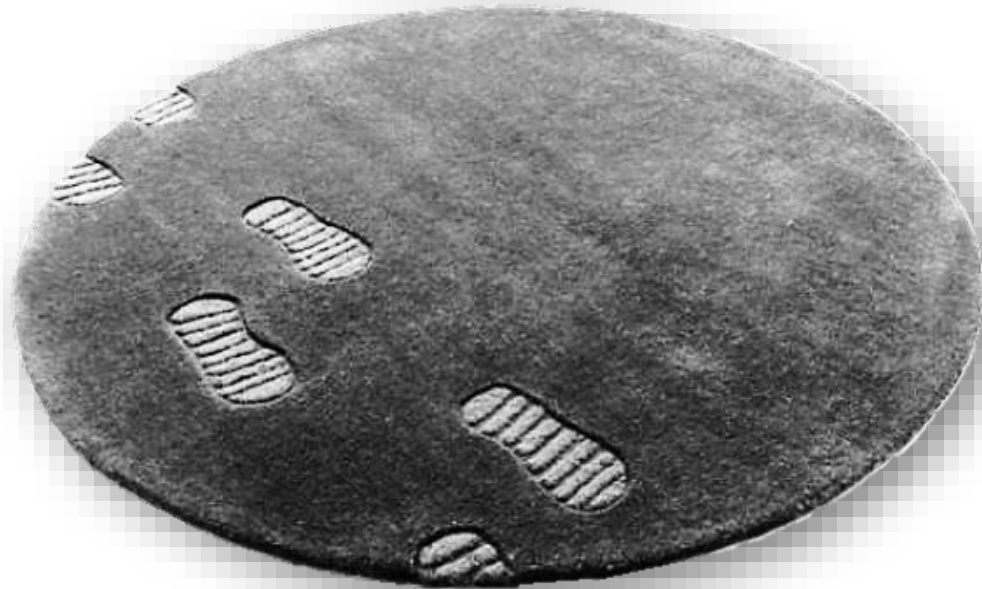


Used in anesthesia for treating upper uteral calculi

Different Models of the Piezo Pen



What To Expect



With each click of the pen, both doctor and patient feel a mild electrical sensation, like the static electricity feeling one may experience when touching a person after walking across a carpeted floor.

Acupuncture



Acupuncture point used to increase lactation in breast feeding mothers was Small intestine 1 (SI 1). SI 1 is known as an empirical point to increase lactation. The Small intestine meridian has a total of 19 points.

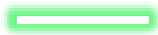


The first point SI 1 starts at the lateral corner of the pinky finger (both hands) and travels up the arm to SI 19, just lateral of the tragus of the ear.

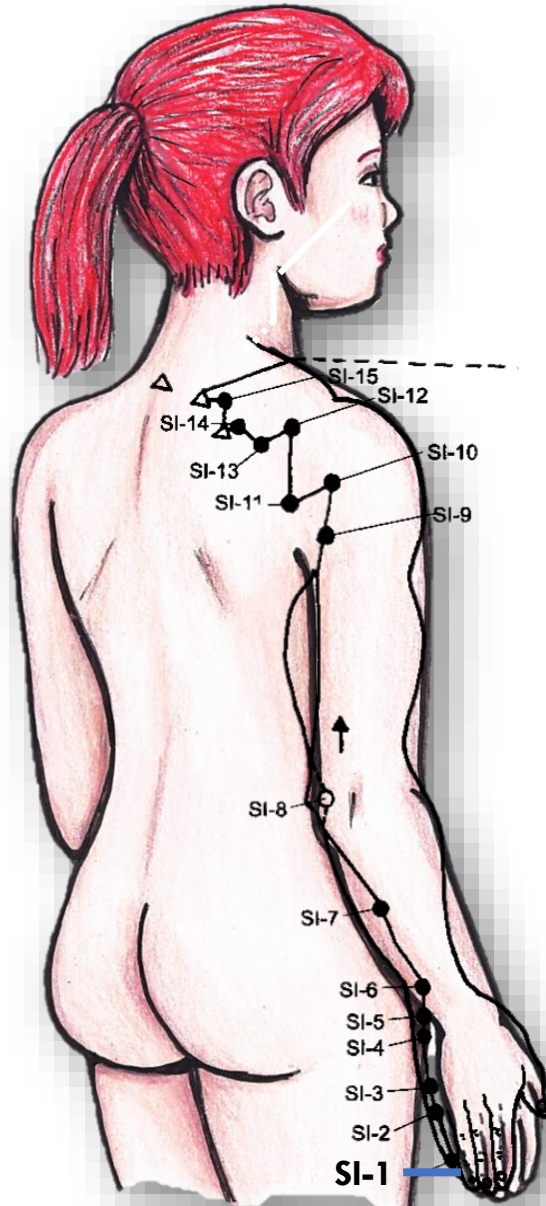
The Small Intestine Meridian



Acupuncture point

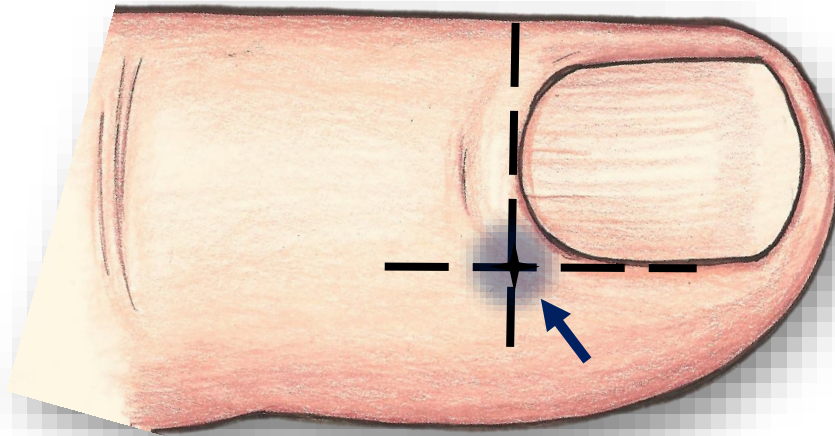


Acupuncture Meridian

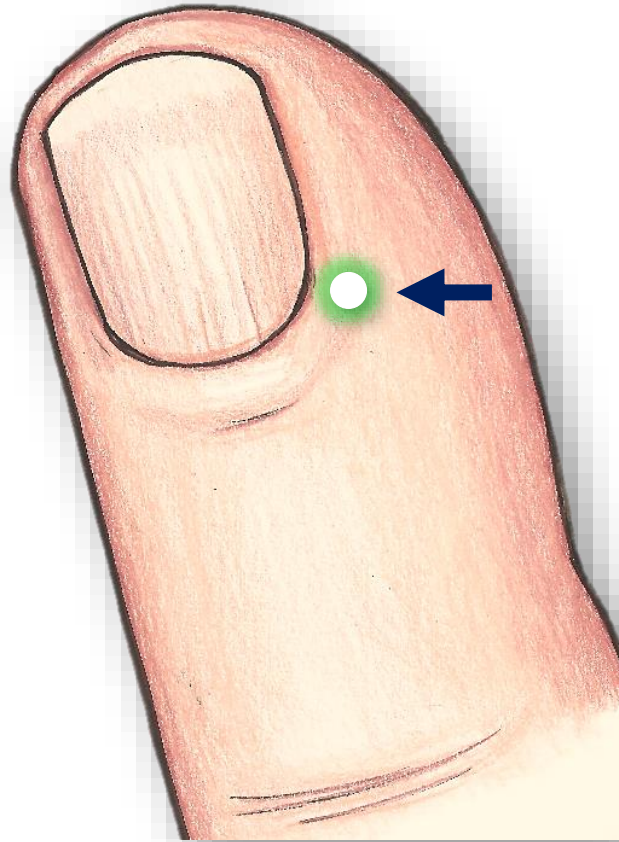


Location of Small Intestine 1 (Side View)

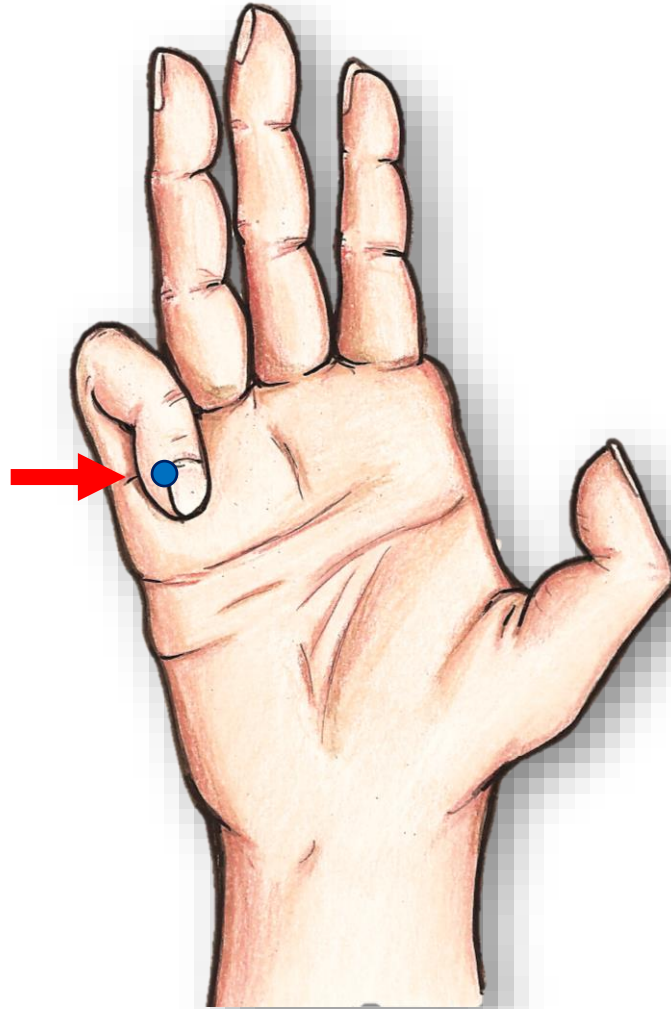
SI-1 is located on the dorsal side of the little finger. It is 0.1 cun (approximately .1 in) from the corner of the nail. The cun is a Chinese measure of length. It is the width of a person's thumb at the knuckle.



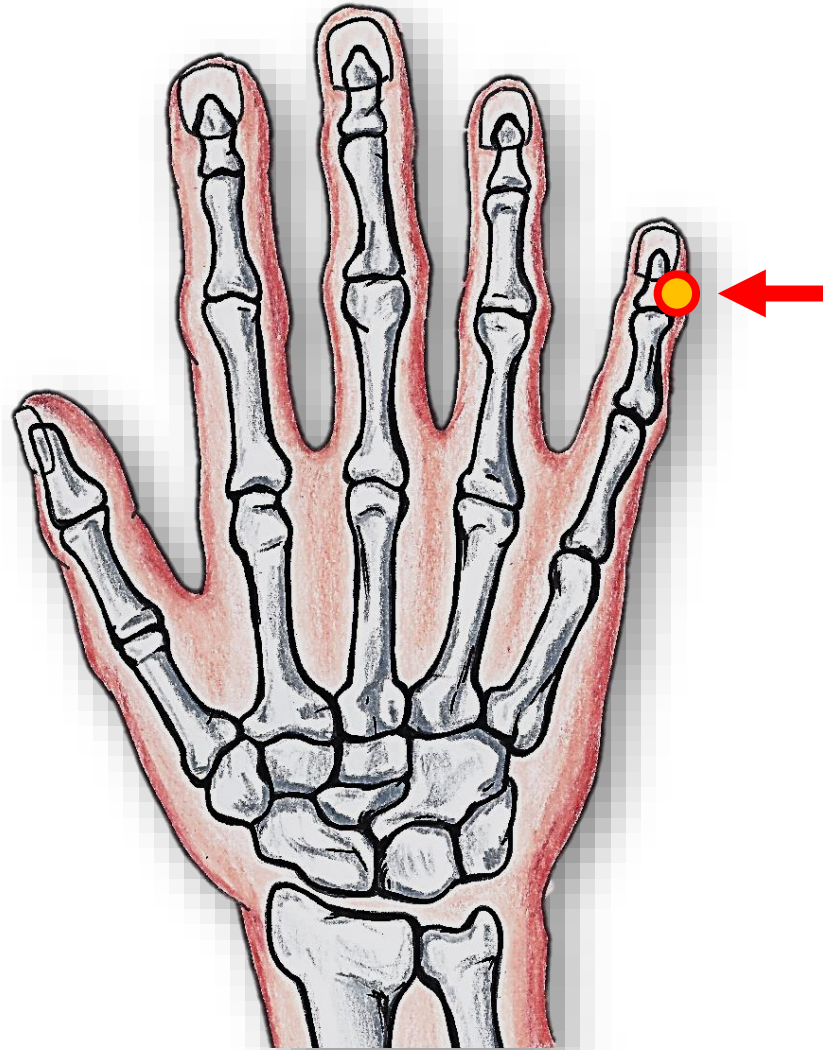
Arrow Pointing to Small Intestine1 (Front View)



Arrow Pointing to Small intestine 1



Arrow Pointing to Small Intestine 1



Jing (Well) Points



Meridians starting points are called Jing-Well points.



They are located on the fingers and toes of the four extremities.



The indications for the use of these points are fullness in the chest and mental disorders related to the Yin organs.

An Empirical Point?



Empirical means a source of knowledge that was or is acquired by means of observation or experimentation or one might say “because.”

Imagination



The treatment of insufficient lactation in nursing women with the use of classical Chinese acupuncture point SI 1 and the Piezo pen.



Imagination was the key to this protocol working. You could have used a needle on SI 1, but with repeated use, it is painful and may cause soreness or infection. Using the Piezo pen would allow for multiple treatments throughout the day and your patients can do this at home.

Why Piezo and Not Needles



According to Peter Deadman (A Manual of Acupuncture) SI 1 can be needled or pricked to bleed.



According to Howard Et al. Small intestine 1 can be stimulated by Piezo pen. We have observed that it's safer and more efficient for multiple stimulations of that point each day.

Production of Milk Per Day



750 ml/cc per day. With 8 pumps per day that works out to 93 milliliters (mL's) per pump.



My subject is a healthy 32-year-old first time mom. Her baby was born at week 28 of gestation.



Mom began to lactate right after delivery of her baby

Lactation Results For the First 4 Weeks



My patient pumped 8 times per day (every 3 hours). She received more milk from her right breast than her left breast. She is right handed.



On average my patient produced 30 to 60 mL's of milk per pumping. Mom was prescribed pain medicine due to delivery and had to discard all the milk she pumped in the 5 days she was on the medicine.



For the first week her baby was consuming (1 to 5 mL's of milk every three hours). By week 6 her baby was consuming 384 mL's per day.

Results of Protocol



When we stimulated both SI 1's with the Piezo pen (10 – 15 clicks on each finger) my patient's milk production went from 30 – 60 mL's to 100 – 120 mL's. If we didn't stimulate SI 1 with the Piezo pen prior to her next pumping (3 hours later)



My patient's milk production dropped by 15 mL's. This drop would continue with each additional pumping if the Piezo was not used till she plateaued to her normal 30 – 60 mL's per pumping. These results were achieved by stimulating only SI 1 on the patient's left hand (non-dominant hand).

How to Perform the Protocol



Just before your patient is about to pump (within a minute or two) have her or her husband stimulate SI 1 with the Piezo pen.

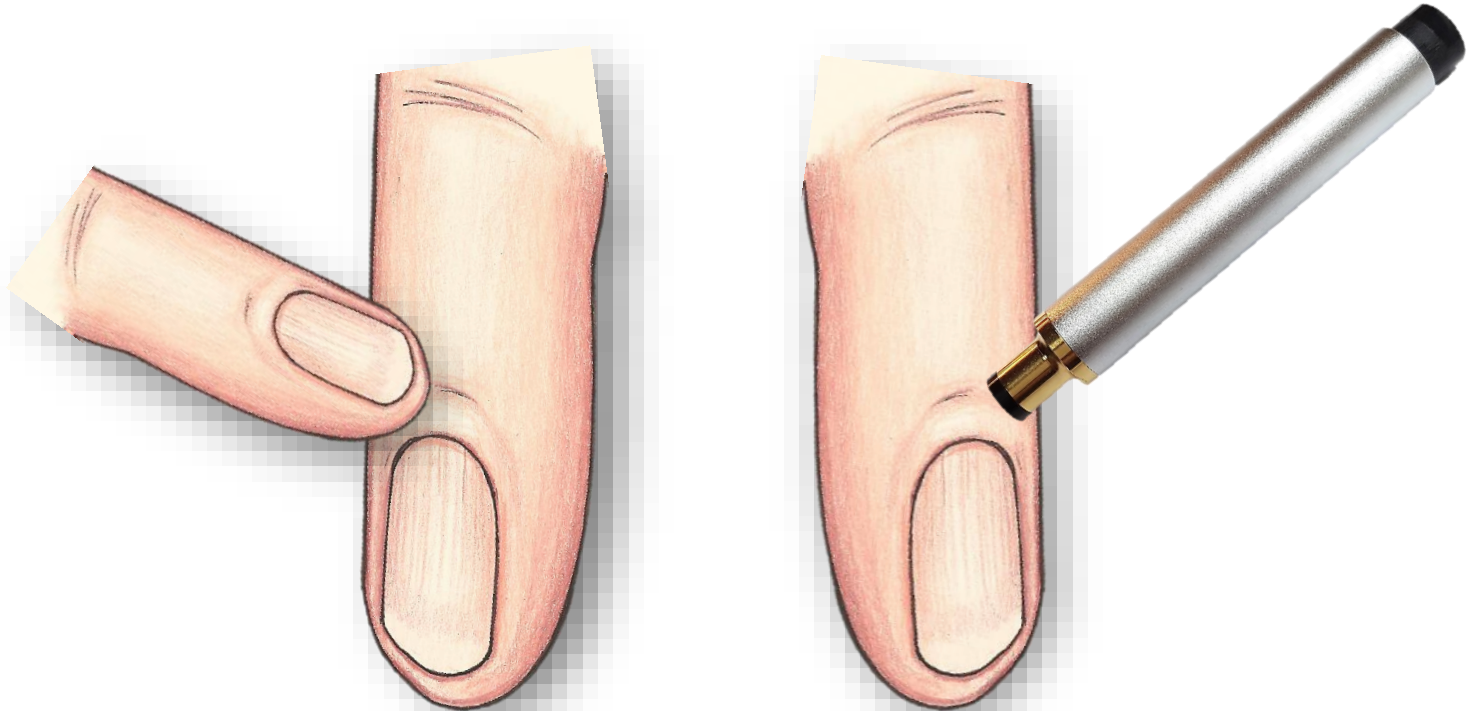


Place one finger on SI 1 and on the other hand place the Piezo pen on SI 1.



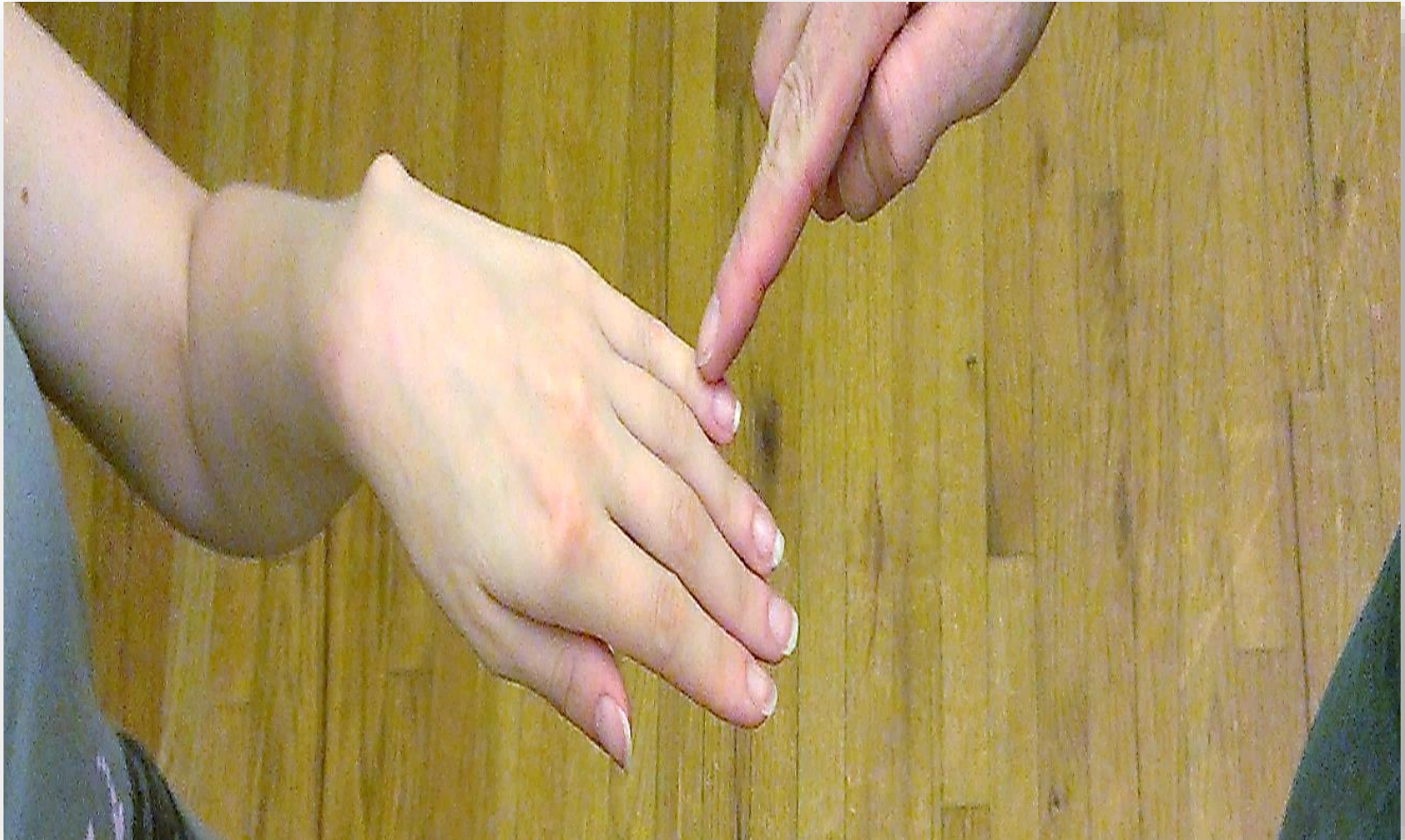
If your patient has no one around to help her, just have her stimulate SI 1 on each hand with the Piezo pen. Stimulate each point 10 to 15 times.

Points and How to Use the Piezo Pen



Place 1 Finger on SI 1 of your Patient's Hand

As seen in the picture below



Place the Piezo Pen on SI 1 of Your Patient's Opposite Hand

As seen below in the picture



Click the Piezo Pen 10 to 15 Times Then Switch Hands



Piezo Pen and Finger Now Switched Hands

Click the Piezo pen 10 to 15 times again



© Lauren Howard

Use the Piezo Pen on One or Both Hands When

Example below



If your patient is getting at least 75 mL's of milk out of one breast you can use the Piezo pen on one hand. The hand on the side of the breast that is producing less than 75 mL's of milk.



In my patient's case her left breast would always produce less than 75 mL's of milk and her right breast would produce at least 75 mL's of milk. In this case I would only use the Piezo pen on her left hand. As seen in the picture on the next page.

Left Breast is Producing Less Than 75 ML's of Milk per Pumping

Only use the Piezo on the left hand



© Lauren Howard

Right Breast is Producing Less Than 75 ML's

Only use the Piezo on the right hand



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Both Sides are Producing Less Than 75 ML's Per Pumping

Piezo on left, finger on right click 10 to 15 times. Switch hands



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Both Are Producing Less Than 75 ML's Per Pumping

Piezo on right hand and finger on left, click 10 to 15 times



© Lauren Howard

Both Are Producing Less Than 75 ML's Per Pumping

Piezo on left hand, finger on right click 10 to 15 times.



© Lauren Howard

Teach Your Patient's to use at Home



With one hand hold the Piezo pen in the palm of your hand with the head (gold part) facing down. Place your thumb on top of the Piezo pen.



With your other hand (two-person technique) take your index finger and place it on SI 1. Make sure when you treat that both the piezo pen and your finger are touching your patient's skin.



Touching any clothing or jewelry will negatively affect the results. Push down on the plunger (top of the Piezo pen and click 10 to 15 times on each hand. Both you and your patient will feel a slight shock each time you click the piezo pen.

Everything Piezo Pen

How often can you use the Piezo pen

You can use the Piezo pen as many times as you pump in a day. I have personally used mine upwards of 20 times in one day

Piezo pen Contraindications

Anyone with a pacemaker, either the patient or person clicking the Piezo pen, should NOT do this protocol. Also those who are energy sensitive, aka people who can make watches stop working, or those can influence equipment around them.

How long will A Piezo pen last

For many years or 10,000 clicks. When my piezo pens become weak in there ability to produce a strong current, I keep them and use them in place of needles for children or patients who don't like needles. Remember your piezo pen must be touching skin when clicked. If you click in the air without touching anything it will run out much quicker

Where can you get a Piezo pen

At Lhasa OMS (lhasaoms.com) They can be reached at 1-800-722-8775. You will not find them in there catalog or on there website as they sell out fast. You can only order them by phone