

TOPIC OF THE MONTH
 June 2013

INSIDE OUT POSTURING, continued.

Janu Sirsasana A B C

The Janu Sirsasana series is about the pancreas. We use the Janu Sirsasana series to press on various nerves that stimulate certain reactions from the pancreas.

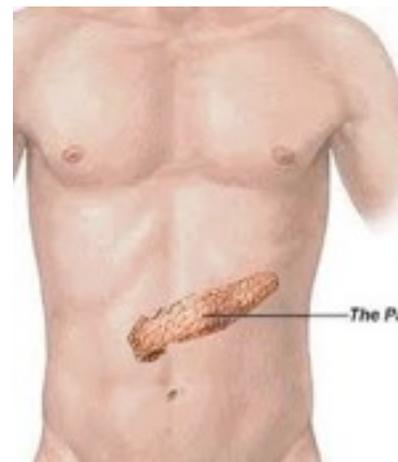
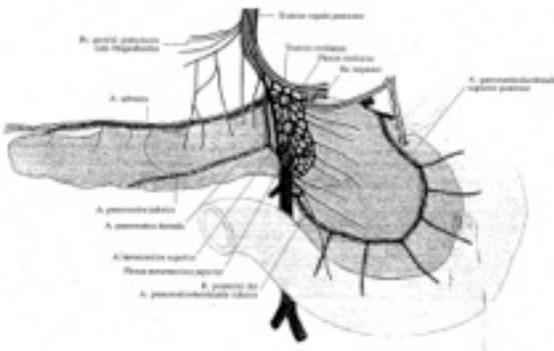
The Pancreas

The pancreas is a gland organ in the digestive and endocrine system. It is both an endocrine and exocrine gland. Endocrine means "in pouring" -- pouring hormones into our blood, **producing several important hormones, including insulin, glucagon, and somatostatin.** (Glucagon is the opposite of Insulin -- in that it raises our blood glucose levels for our muscles to use or when our blood sugars fall too low. Glucagon stimulates the liver to covert stored glycogen into glucose which is released into our blood stream for energy. Somatostatin secreted by the pancreas acts as a hormone that inhibits the secretion of insulin and glucagon, and reduces the activity of the digestive system -- this is done by the body if we need blood to exercising muscles, blood is diverted from digestion to where our body needs it.)

The pancreas is also an exocrine gland (exocrine means out-pouring, -- pouring through a gland to something external) **secreting pancreatic juice containing digestive enzymes to the small intestine.** These enzymes help breakdown carbohydrates, protein, and fat improving digestion. The pancreas also creates a bicarbonate solution to buffer the food from the stomach to the duodenum on its way to the small intestine.

The pancreas has two main functional components: endocrine, to produce insulin and other hormones, and exocrine, to produce pancreatic juices for digestion. The pancreas is in direct contact with the stomach, duodenum, spleen, and major vessels of the abdomen.

The Pancreas has more nerves connected to it than any organ I have yet studied! We are not actually trying to press on the pancreas with our heel as we do the other organs. The pancreas handles several oppositional functions -- from the production and release of insulin and somatostatin (which are oppositional) to the production and release of strong enzymes for digestion to a bicarbonate solution that neutralizes the acid as it leaves the stomach. You don't want to be poking around on just any area of the pancreas -- the digestive enzymes it creates are so acidic that if the pancreas were to rupture the acid would burn surrounding tissues. (In one book I read it referred to the pancreas as the P-bomb . . .) Instead we use our heel to press on nerves innervating the pancreas.

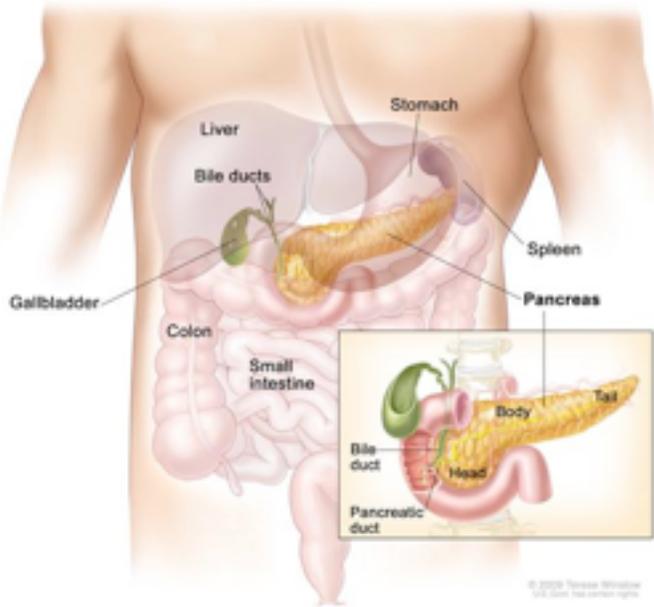


Furthermore, the position of the pancreas in our abdomen is a sign we don't want to mess with it. The pancreas is located behind the stomach and in front



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of the kidneys -- deep in the center of our body where it is well protected.



Understanding how your body works can improve your health, for example; diabetes (see grey text box). Nerves connected to the pancreas tie both to the

parasympathetic (calming) and sympathetic (stimulating) nervous system . . .

remember the pancreas likes oppositional tasks . . .

Parasympathetic neural inputs are activated (after traveling through

This is another example of why something like diet soda is not effective . . . your body tastes sugar, thinks its getting sugar so the pancreas prepares by sending out insulin (via communications through the vagus nerve), then sugar does not come. Because of the insulin release your blood sugar drops . . . Do you know what happens when your blood sugar drops? You get very hungry . . . suddenly you are craving sugar and heading for a snack . . . You can't fool the body.

vagus nerve) through sensory stimuli -- sight, scent, taste --

stimulating insulin secretion even before there is an increase in

blood glucose. Insulin is secreted in anticipation of food -- our body likes to be prepared!

Input from the sympathetic nervous system inhibits insulin secretion -- for times when your muscles need glucose. During activity the body needs to prevent glucose uptake by non-muscle cells (which insulin stimulates), so insulin secretion is inhibited.

Janu Sirsasana A - The A position is a preparatory for the B & C positions. The A position does have an additional benefit (I am trying to stick with the science in this topic but can't help bringing a little pure yoga theory in here); Janu Sirsasana A is a mudra (a mudra is a body position that elicits energy movement) known as maha mudra. Maha mudra has your hands to your feet, your chin to your chest, strong lifting action of the bandhas with deep breathing -- this position is useful for moving energy in your spine. As is the entire Janu Sirsasana series-- if you round your back, tuck your chin, and put your head on your knee. For more information on performing the posture:<http://www.befityoga.com/philosophy-lifestyle/ashtanga-yoga-poses/> and scroll down to janu sirsasana A.

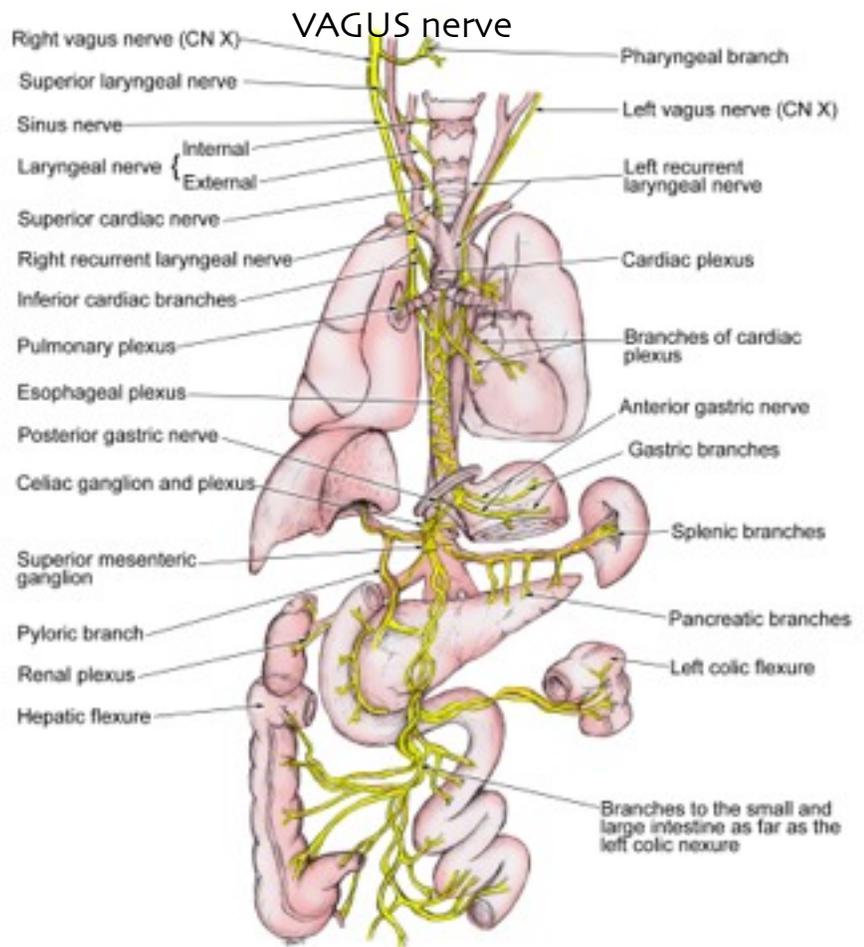
Janu Sirsasana B puts the heel in the perineum . . . in the raphe of the perineum to be exact -- a little seam in the perineum. In men, this raphe continues through the midline of the scrotum (scrotal raphe) and upwards through the posterior midline of the penis (penile raphe). In women it is the developmental equivalent of the labia.

The perineum is given much attention in yogic texts as the seat of where our energy is stored and can either move or get stagnant -- the beauty of this English word (perineum) is probably derived from perennial, which means constant flow of energy, like a perennial river or flower. This region is between the anus and genitals, or between the anus and vegetables as I like to say ;) For more information on the posture: <http://www.befityoga.com/philosophy-lifestyle/ashtanga-yoga-poses/> and scroll down to janu sirsasana B.

The perineal raphe in yoga terms is known as the Shivani Nadi. In “Yoga Mala” it says Janu Sirsasana series has a powerful effect on the urinary system, as this nadi becomes stronger it heals all our tissues, known as the 7 dhatus, and cures diabetes. It also cures maladies such as burning during urination, semen loss, and erectile dysfunction.

ॐ The 7 Dhatus - There are seven dhatu or tissues in the body known as sapta dhatu: blood, fat, flesh, bone, marrow, skin, semen/ova. To maintain these tissues, certain chemical hormones need to be produced, which the pancreas is involved in the production of. When these tissues are healthy, disease has a harder time taking hold of our body.

In researching how pressing our heel into our perineum heals all our tissues, I came across the vagus nerve once again. The vagus nerve is a major nerve in our body that regulates many functions -- such as helping to regulate the heart beat, control muscle movement, keep you breathing, transmitting a variety of hormones through the body, keeping the digestive tract in working order, contracting the muscles of the stomach and intestines to help process food, timing digestion and the release of various chemicals and hormones for digestion, and sending back information to the brain and spinal cord about what is being digested and what the body is getting out of it. Whew. What would we do without our vagus nerve? By the way you will learn much more about your vagus nerve when we look at the bandhas from inside out.



So as I started researching the benefits of the Janu Sirsasana series I knew it had to be related to the vagus nerve . . . however the vagus nerve originating from the brain extends all the way down to the pancreas and into the beginning of the colon -- it does not reach where our heel presses in Janu sirsasana B or C . . . so I was perplexed. More research was necessary. As it turns out the pancreas is the connection for the vagus nerve to regulate many of its functions -- so many of the nerves to and from pancreas actually connect through the pancreas to the vagus nerve. Which leads us to Janu Sirsasana B:

I discovered one of the many nerves to the pancreas is the splanchnic nerve (a splanchnic nerve is a nerve, parasympathetic OR sympathetic, that brings innervation to viscera), this nerve has fibers from the rectum and bladder to the sacrum, the prostate, and to the pancreas. It **regulates emptying the bladder and rectum, as well as sexual functions.** It would seem the shivani nadi could be the

splanchnic nerve. If so, Janu Sirsasana B stimulates the splanchnic nerve in regulating the bladder and rectum, and sexual functions, which is stated in Yoga Mala.

Another tie to Janu Sirsasana B is through the pressure from the heel on prostate in men (which also will effect sexual functions).

Latest research shows that gentle massage of the prostate [by a urologist] may be beneficial by:

- ☯ helping to drain painfully sequestered secretions in a chronically inflamed prostate gland or seminal vesicles;
- ☯ by releasing the tension around nerve endings behind the prostate. **This represents a form of "myofascial release".**

<http://www.chronicprostatitis.com/massage.html>

Since the Splanchnic nerve is attached to the rectum, placing your heel closer to your rectum would seem to be more direct pressure on the specific nerve to stimulate it.

There seem to be varying opinions on how to place your foot and heel ("pointed" (plantar flexion) or flexed (dorsi flexion) . . . whichever position makes your heel press further into your perineum would be the best foot/heel position for you.

Just for further verification, here is what wikipedia has to say about the splanchnic nerve:

Pelvic splanchnic nerves or nervi erigentes are [splanchnic nerves](#) that arise from sacral [spinal nerves S2, S3, S4](#) to provide [parasympathetic](#) innervation to the [hindgut](#).

Structure

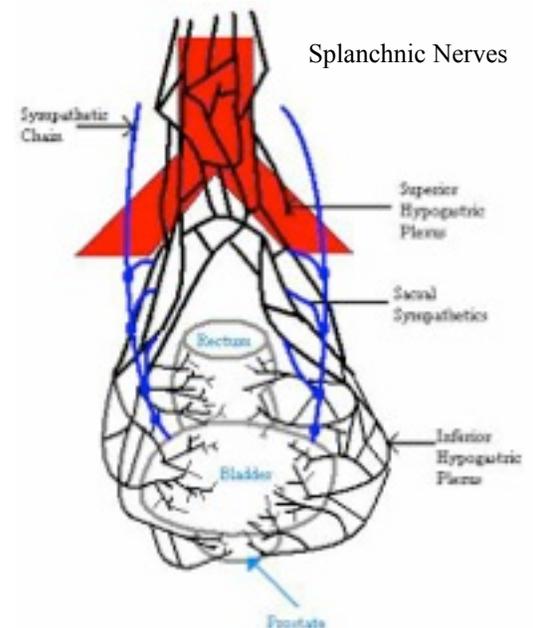
The pelvic splanchnic nerves arise from the ventral rami of the S2-S4 and enter the sacral plexus. They travel to their side's corresponding [inferior hypogastric plexus](#), located bilaterally on the walls of the rectum.

From there, they contribute to the innervation of the [pelvic](#) and [genital](#) organs. The nerves regulate the emptying of the [urinary bladder](#) and the [rectum](#) as well as [sexual](#) functions like [erection](#).

They contain both [preganglionic](#) parasympathetic fibers as well as visceral afferent fibers.

The [parasympathetic nervous system](#) is referred to as the cranio-sacral outflow; the pelvic splanchnic nerves are the sacral component. They are in the same region as the [sacral splanchnic nerves](#), which arise from the [sympathetic trunk](#) and provide sympathetic efferent fibers.

The proximal 2/3 of the [transverse colon](#), and the rest of the proximal [gastrointestinal tract](#) is supplied its parasympathetic fibers by the [vagus nerve](#). In the distal 1/3 of the transverse colon, and through the sigmoid and rectum, the pelvic splanchnic nerves take over.



As I mentioned earlier, there are many more nerves in and out of the pancreas, below is an excerpt from some research I came across on the pancreatic nerves:

Nerves in the pancreas: what are they for? Dale E. Bockman, Ph.D.*

Department of Cellular Biology and Anatomy, Medical College of Georgia, 3303 Rae's Court, Augusta, GA 30909-3139, USA

The pancreas is richly supplied with nerves deriving from different locations, nerve fibers of different types intermingle as they enter or leave the pancreas, frequently closely adherent to pancreatic arteries [1,2]. Their connections include the brain, spinal cord, and enteric nervous system. The primary nerves supplying the pancreas are the vagus and splanchnic nerves, each one carrying both efferent and afferent components. In addition, nervous connections are present between the pancreas and the lower stomach and duodenum, establishing a direct connection from the enteric nervous system, which is a network of nerve fibers and nerve-cell bodies serving as a semiautonomous controller of alimentary tract motility and secretion [3].

Reflex activity makes it possible for sensory nerves to affect responses, in either the endocrine or exocrine pancreas, for substances detected in areas both within and outside the pancreas. Thus, the sight, smell, and/or taste of food can produce cephalic phase



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responses by exocrine cells. Similarly, sensing a level of glucose someplace other than in the pancreas can lead to responses by endocrine cells.

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Nerves Are Important for the Secretion of Enzymes

The efferent limb of the vagus nerve seems to be especially important in humans for the secretion of pancreatic enzymes.

There Are Multiple Nerve Pathways to and from the Pancreas

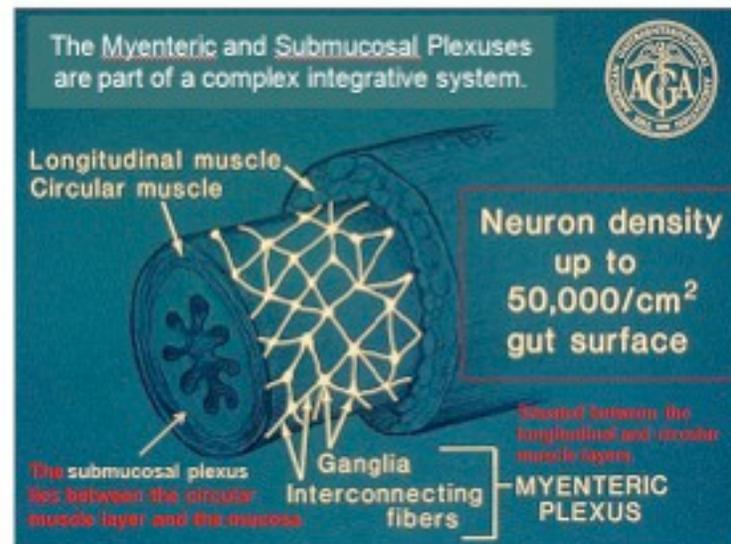
Most of the nerves serving the pancreas pass through the celiac (solar) plexus. Parasympathetic fibers in the vagus nerve leave the brainstem and pass through the celiac plexus into the pancreas without synapse. They end on intrinsic ganglia. Postganglionic parasympathetic fibers extend from the intrinsic ganglia to end close to exocrine cells and islets. Sympathetic fibers originate from nerve cell bodies in the thoracic intermediolateral cell columns of the spinal cord. They exit to pass through sympathetic ganglia without synapse, form splanchnic nerves, and terminate on celiac ganglia that are part of the celiac plexus. Postganglionic sympathetic fibers enter the pancreas at the periphery of pancreatic arteries in company with vagal fibers. Sympathetic fibers end close to blood vessels, exocrine cells, and endocrine cells. Sensory fibers are contained within the vagus and splanchnic nerves. Their pathway is the same as sympathetic and parasympathetic fibers, but their action potentials are propagated from the pancreas to the central nervous system.

The American Journal of Surgery 194 (Suppl to October 2007) S61–S64

There is another nadi strengthened by the Janu Sirsasana series . . . which brings us to **The Virya Nala.**

In “Yoga Mala” it says this nadi connects to the liver and is responsible for creating insulin (pg. 90). In Lino’s book it says virya nala is the urinary tract; In yoga mala it refers to virya nala as the passageway that sperm flows through (vas deferens) (pg. 109 supta padanghustasana). Since the virya nala is present in women it would lead me to believe that the virya nala is NOT only the vas deferens (passageway for sperm), but also the urethra. Men’s urethra is much longer than women’s and it passes near the perineum where the heel would press on it in janu sirsasana B (but not women -- we have a short urethra that is in the lower abdomen that Janu Sirsasana C would press on).

Janu Sirsasana C also has connection to controlling the release of insulin from the pancreas -- this is through the gut-pancreas-vagus nerve connection, the **myenteric plexus** (which is connected to the vagus nerve, the pancreatic plexus, and the Enteric Nervous System <the digestive nervous system> which connects into the Central Nervous System! -- Connecting pretty much the entire body . . .).



The myenteric plexus functions as part of the Enteric Nervous System or ENS (the nervous system of the intestines and digestion). The main “job” of the myenteric plexus is motor activity -- moving something along its path. The secondary function of the myenteric plexus neurons is controlling the secretion of enzymes. It receives its messages from the vagus nerve and responds by transmitting the message to muscle cells, which are thereby activated to contract. The myenteric plexus is a network of unmyelinated nerve fibers and neuron cell bodies that are tucked in among the layers of our

esophagus, stomach and intestines. It tells the smooth muscles to contract to move matter along its path. Unmyelinated nerves moves slower than nerves that have a myelin sheath around them.

The myenteric plexus controls secretion of hormones into the blood (ex. insulin), absorption, blood flow and the interactions between the organs (for example opening a sphincter so food can pass from one organ to the next). Making the gut-pancreas connection an important connection in how the body times digestion and absorption of nutrients.

This plexus is an important component of the entire digestive tract. There is only one myenteric plexus by the way; since the neurons are present in the different organs I thought each organ had its own plexus . . . this is not the case they all connect through the ENS and are one plexus.

Janu Sirsasana C

Putting your heel in your gut as in Janu Sirsasana C position would put pressure on these nerves in the intestines stimulating their action throughout the entire digestive tract. Pattabhi Jois mentions that women need Janu Sirsasana C to access the functions of the Virya Nala however men can also access the virya nala through Janu Sirsasana B -- the urethra men can access through the perineum as their urethra is longer than in women. Pressure on the urethra might also stimulate the myenteric plexus for men in Janu Sirsasana B to get this effect.

Janu Sirsasana C also presses on the uterus for women improving its tone and function. Although Pattabhi Jois says both sexes should do all three postures as they are necessary and useful for both sexes.

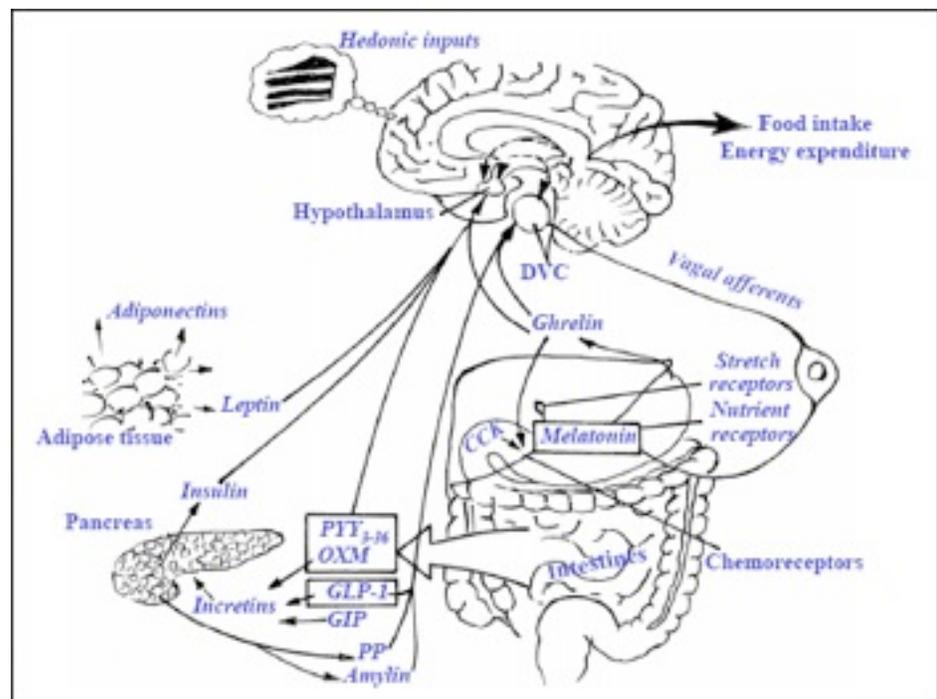
In Janu Sirsasana C you want to **guide your heel to press into your intestines, ideally below your navel.** To do this safely be careful how you twist your foot -- **its best to slide your arm under your calf and carefully pull back your toes, then let your knee relax down (do not push it).** Place the ball of your foot on the floor if you can, then bend forward pressing your heel into your gut.

For more information on Janu Sirsasana C: <http://www.befityoga.com/philosophy-lifestyle/ashtanga-yoga-poses/> and scroll down to Janu Sirsasana C.

Just for further verification, here is another study from the Journal of Neuroscience, (May 1990) that connected the gut-pancreas connection, I just copied the final summarizing paragraph, here is the link to the entire study [Innervation of the Pancreas by Neurons in the Gut - ResearchGate](http://www.researchgate.net/publication/237111111_Innervation_of_the_Pancreas_by_Neurons_in_the_Gut)

In summary, the current experiments

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demonstrate for the first time that the enteric nervous system can influence the activity of pancreas. Although both the exocrine and endocrine portions of the pancreas are affected by the gut, it seems likely that the activity of neither is influenced predominantly by enteric nerves that terminate directly on acinar or islet cells. Instead, the primary target of the entero-pancreatic innervation appears to be pancreatic ganglia, which transmit the signal to the effectors. The neural transmission of signals from gut to pancreas appears to be primarily cholinergic; however, the presence of substantial numbers of entero-pancreatic serotonergic axons indicates that a more complicated regulatory function also exists. It is thus clear that pancreatic activity can be influenced by the bowel through at least 3 different mechanisms. One is endocrine, depending on the release of hormones from the gastrointestinal mucosa. Another is neural, involving centrally processed reflexes with an efferent arm that encompasses the vagus and/or sympathetic nerves (Singer et al., 1989). The third is the currently demonstrated direct entero-pancreatic pathway. It remains for future experiments to determine which (or which combinations) of these possible mechanisms is utilized by particular stimuli and the physiological role played by each.

By A.L. Kirchgessner and M.D. Gershon

So an interesting fact here . . . some of this research on the myenteric plexus is "new research" (from the book "The Second Brain" by Michael D. Gershon, MD). . . how did Pattabhi Jois have this information in the 30s and 40s? And the Yogic texts even before that? . . .

Here is what wikipedia has to say about the myenteric plexus:

Auerbach's plexus (or myenteric plexus) provides motor innervation to both layers of the tunica muscularis, having both parasympathetic and sympathetic input, and provides secretomotor innervation to the mucosa nearest the lumen of the gut.

It arises from cells in the nucleus ala cinerea, the parasympathetic nucleus of origin for the tenth cranial nerve (vagus nerve), located in the medulla oblongata. The fibers are carried by both the anterior and posterior vagal nerves. The myenteric plexus is the major nerve supply to the gastrointestinal tract and controls GI tract motility.[1]

They are neurons without a sheath like other nerves. Through intestinal <smooth> muscles, the motor neurons control [peristalsis](#) and churning of intestinal contents. Other neurons control the secretion of [enzymes](#).

The myenteric plexus is the digestive nerve plexus -- intricate layers of nervous tissue that control movements in the esophagus, stomach, and intestines. The myenteric plexus is situated between the circular muscle layer and the longitudinal muscle layer in the lower esophagus, stomach, and intestines.

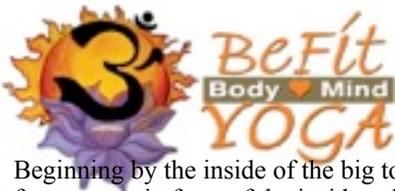
Britannica says:

The myenteric plexus receives its messages from the vagus nerve and responds by transmitting the message to muscle cells, which are thereby activated to contract. Control of nerve impulses is involuntary. The muscles of the stomach and intestines play an active role in digestion, as waves of muscle contractions (peristaltic waves) push food through the parts of the digestive tract. It is thought that the myenteric plexus stimulates the muscles to contract in peristaltic waves and that it helps keep muscle tone throughout the intestine walls, promotes secretions of intestinal juices, and allows muscular constrictions (sphincters) to open, thus permitting food to pass from one part of the [digestive system](#) to another.

Events that are controlled, at least in part, by the ENS are multiple and include motor activity, secretion, absorption, blood flow, and interaction with other organs such as the gallbladder or pancreas. These links take the form of parasympathetic and sympathetic fibers that connect either the central and enteric nervous systems or connect the central nervous system directly with the digestive tract. Through these cross connections, the gut can provide sensory information to the CNS, and the CNS can affect gastrointestinal function. Connection to the central nervous system also means that signals from outside of the digestive system can be relayed to the digestive system: for instance, the sight of appealing food stimulates secretion in the stomach.[4]

Also of mention by Pattabhi Jois is the connection of the virya nala to the liver channel. Does he mean the liver channel as in acupuncture? If so that is an easy connection to make . . . or was he referring to the pancreas duct which connects with the liver and gall bladder bile duct and enter the duodenum together delivering bile and digestive chemicals to the small intestine? . . .

According to Chinese medicine the liver channel flows from our big toes to the crown of our head (one of the reasons we catch our big toes in the postures!), on its path it goes along the inner thigh to the groin, circulates the external genitals, connects with the conception vessel and continues upward. This certainly would put the liver meridian in contact with the myenteric plexus:



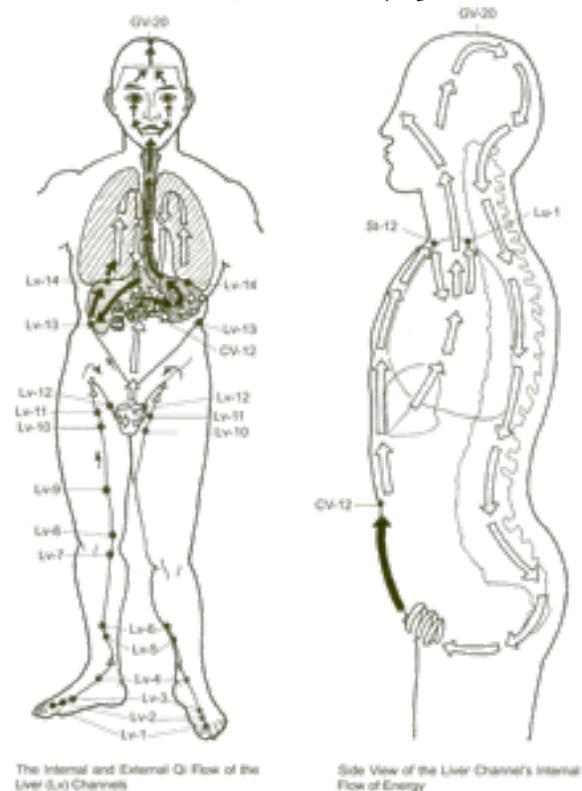
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Beginning by the inside of the big toenail, the liver channel crosses the top of the foot, passes in front of the inside ankle and up the inner aspect of the leg through SP-6 close behind the edge of the bone. It continues past the knee along the inner thigh to the groin and pubic region, where it circulates the external genitals. It connects with the conception vessel in the lower abdomen and continues up around the stomach to enter both the liver and gallbladder. Connecting with two surface points on the ribs, the channel then dips into the ribcage, runs up through the throat, opening to the eye, and ends at the crown of the head where it connects with the governing vessel. A branch circles the mouth. From within the liver, another internal branch reaches the lungs, and this restarts the cycle of qi. (excerpt from and good info on liver meridian: <http://lieske.com/channels/5e-liver.htm>)

The Pancreas in the Emotional Body

The pancreas represents the sweetness of life. Diabetes may be a result of not having sweetness in your life. Pancreatitis tends to be the result of someone who worries too much, having deep fear about losing control over your own or others well being.

The pancreas is the gland linked with the solar plexus chakra (3rd chakra) which deals with emotions, desires, and intellectual activities. Diabetes or pancreatitis are signs that we are worrying too much -- losing the sweetness of life. Instead focus on what you do have in your life that is sweet, don't let yourself be distracted by what you may want tomorrow.



Whew! This concludes my study on the Janu Sirsasana series (for now). I have put many many hours into this research -- more than any other pose at this time. I certainly wish I had this knowledge when I was learning the series in the 90s . . . I did not like Janu Sirsasana C . . . it was tight on my body so I skipped it for a couple years! Now I understand why we do these funky things with our heels . . . The Janu Sirsasana series is a powerful series that gets into the nervous system regulating many important functions in our body.

Inside Out Posturing will be continued in September with a look at the Marichyasana series.