

Nauli Kriya: Detoxifying Inner Anatomy and Physiology

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Abstracts: *Nauli is one among Shatkarma and in Hatha Yoga Pradipika it is well explained. Aim and Objectives: According to Hatha Yoga Pradipika, Nauli kriya is a yogic cleansing exercise that is working on gastric fire and can cure all diseases. Methods: Contracting, isolating & rolling movement of the abdominal muscles. Conclusions: It is an advanced technique that is believed to cleanse the internal organs, particularly the digestive organs and small intestines, and tones the core muscles. As all diseases have their roots in Mandagni through proper Jatharagni all Dhatvagni and Bhutagni can perform at their optimum level and can prevent and cure all the diseases.*

Keywords: Nauli Kriya, Shatkarma, Yogi, Hatha Yoga Pradipika, Hatha Yoga Practice, Uddiyana Bandha, Vama Nauli, Dakshina Nauli, Madhyama Nauli, Sitting Nauli

1. Introductions

Hatha Yoga Pradipika explains the pathway to achieve the ultimate state of a healthy body. *Shatkarma* is given to achieve a healthy state of the body. Nauli is one among *Shatkarma*. In *Nauli Kriya* Lean forward, protrude the abdomen and rotate (the muscles) from right to left with speed. This is called *Nauli* by *Swami Muktibodhananda*. [1] Some other opinions describe the Sanskrit word *Nauli* as “to churn”. B. K. S. Iyengar says that “Nau” means “boat” and “li” means “to cling to, lie on, or cover.” According to him, “pitching of a boat on a stormy sea conveys some idea of the process of *Nauli*”. [2]

2. Literary Review

Hatha Yoga Pradipika, a 15th century *Yoga* text written by an Indian *Yogi* named *Swatmarama* has firstly explained the *Nauli Kriya*. According to *Hatha Yoga Pradipika*, *Yogi* has to: “Lean forward, protrude the abdomen and rotate (the muscles) from right to left with speed. This is called *Nauli* by the siddhas. This *Nauli* is the foremost of the *hatha yoga practices*. It kindles the digestive fire, removing indigestion, sluggish digestion, and all disorders of the doshas, and brings about happiness.” [3] *Nauli* is briefly explained in *Gheranda Samhita* as “Rapidly move the stomach on both sides. This gets rid of all diseases and increases the bodily fire”. [4]

Method of doing *Nauli Kriya*: -

Nauli is practiced in the state of *Uddiyana Bandha*. In this type of *Bandh*, the abdomen along with its viscera (organs) is pulled backward (inwards) towards the back or spine. If a person learns to superimpose the contraction of the rectus abdominis muscles onto *uddiyana bandha* in various positions, Person will sooner or later be able to do so in a standing position with hands on thighs. And if you cultivate this until it is second nature, By contracting the abdomen and pulling it backward, the abdominal muscles are activated, and movements are induced. This is called *Nauli*.

Do this one - two lunge at the rate of about 1 - 2 times per second. If you need to waggle the hips at the same time, that's fine. It will look silly for a while, but after a month or

so of practice you will be able to produce the rolling movement that is characteristic of *nauli*, and be able to do so without much hip motion or side - to - side lunging. Refining the practice, you

Steps to perform *Nauli kriya*: -

Stage 1: - *Vama* and *Dakshina Nauli* (left and right isolation) Stand with the feet 45 to 60 centimeters apart. Bend the knees and rest the palms of the hands just above the knees, thumbs on the insides of the thighs, fingers touching the outsides, Keep the head up and the eyes open. Breathe in deeply through the nose and exhale quickly through the mouth, slightly pursing the lips. Initially Perform *jalandhara bandha* while maintaining *bahiranga* (external) *kumbhaka*. Suck the abdomen and stomach in by performing *uddiyana bandha*. Lift the right hand slightly off the knee, keeping all the pressure on the left hand and knee, but do not lean to the left side. This will automatically isolate the rectus abdominis muscles on the left. Then release *uddiyana bandha*, raise the head slowly, stand up and inhale slowly. This is *vama nauli*.

Practice in the same way on the right side. Keep the right hand resting above the knee and slightly lift the left hand to isolate the rectus abdominal muscles on the right. This is *dakshina nauli*. In between each round of *nauli*, release *uddiyana* first, then *jalandhara*, raise the head, stand erect and then breathe in very slowly through the nose. Take a few normal breaths before practicing the next round.

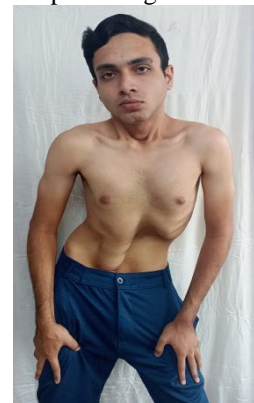


Figure1 about here: *Dakshina Nauli*,

Volume 12 Issue 5, May 2023

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Figure 2 about here: *Vama Nauli*.

Stage 2: - *Madhyama Nauli* (central abdominal contraction)

Practice *vama* or *dakshinanauli* as in stage 1, and then start to roll the muscles to the other side, but before they reach the opposite side hold them in the middle. In order to roll the muscles, slowly bring the weight back onto the hand which was lifted from the knee. Holding *naulimadhyama*, place both hands on the thighs just above the knees. Press diagonally in strong lunges first to one side and then the other to activate the individual rectus abdominis muscles. [Figure 3 about here]: - *Madhyama Nauli*.



Stage 3: Practice in the same way as stages 1 and 2. Do this one - two lunge at the rate of about 1 - 2 times per second. If you need to waggle the hips at the same time, that's fine. It will look silly for a while, but after a month or so of practice you will be able to produce the rolling movement that is characteristic of *nauli*, and be able to do so without much hip motion or side - to - side lunging. Refining the practice. but learn to control the contraction of the muscles and to isolate the muscle groups without lifting the hands from the legs. First try by just releasing the pressure off the hand without moving it from the leg. Gradually begin to control

the practice so that the hands remain fixed on the legs. Then practice with the hands on the upper thighs.

Stage 4: Abdominal rotation or churning

Stand in the same position as in Stage 1, keeping the hands on the legs above the knees throughout the whole practice. Practice *vama nauli* and then roll the muscles to the right and back to the left. Continue rotating the muscles in a clockwise direction. This is known as 'churning'.

Start by practicing it three times consecutively, then release. Practice *dakshina nauli* in the same way, rotating the muscles anticlockwise. When this churning is perfected, practice it three times with *vama nauli*, then three times with *dakshina nauli* and release. When this is perfected you can increase to ten rotations, then twenty rotations.

Stage 5: Practice stages 1 and 2 sitting in Padmasana with the buttocks raised slightly by a cushion. Initially it will be difficult to control the muscles in the sitting position, so it is better to first perfect the practice of *nauli* in the standing position.



Figure 4 about here: *Sitting Nauli*

Contraindication of Nauli Kriya

Persons with recent Abdominal procedures. Persons with Lower back problems Persons with umbilical, inguinal, or hiatus hernia. Persons with ulcerative colitis. Person suffering from acute or chronic appendicitis. Persons having any abdominal cancerous condition. Persons with kidney or gallstones. Persons after taking any meal. Women with menstruation & pregnancy. Persons having any cyst or tumor in their abdomen. Persons with heart disease, hypertension, hernia, gastric or duodenal ulcers, or who are recovering from some internal injury cannot do it.

Anatomical study of structures involved in Nauli Kriya: -

As described before, in Nauli Kriya rectus abdominis muscles are contracted and isolated, and churning of abdominal muscles is done. so first of all to understand its mechanism we have to discuss the anatomy of anterior abdominal wall muscle in detail.

Table 1: Anterior abdominal wall Muscles [5]

Muscles	Origin	Insertion	Innervation	Action
External Oblique	The external surface of the middle of the shaft of the lower eight ribs.	Xiphoid process, Linea alba, Pubic symphysis, Pubic crest, and anterior half of iliac crest	Lower six thoracic nerves	Compress and support abdominal viscera; flex and rotate the trunk
Internal Oblique	Lateral two - thirds of the inguinal ligament, anterior two - third of the intermediate area of iliac crest, thoracolumbar fascia	Lower three or four ribs and their cartilages, Linea - alba, and pubis via conjoint tendon	Lower six thoracic nerves and first lumbar nerves	Compress and support abdominal viscera; flex and rotate the trunk
Transversus abdominis	Internal surface of lower six costal cartilages, thoracolumbar fascia, iliac crest.	Xiphoid process, Linea alba with aponeurosis of internal oblique, pubic crest, and pecten pubis via conjoint tendon	Lower six thoracic nerves and first lumbar nerves	Compresses and supports abdominal viscera
Rectus abdominis	Lateral head from the lateral part of the pubic crest and medial head from the medial part of the pubic crest and anterior pubic ligament.	Xiphoid process and 5th, 6th and 7th costal cartilages	Lower six or seven thoracic nerves.	Flexes trunk (lumbar vertebrae) and compresses abdominal viscera stabilizes and controls tilt of the pelvis (ant lordosis)

Approximately 80% of people have a pyramidalis muscle, which tenses on the linea - alba, it is located in the rectus sheath anterior to the inferior part of the rectus abdominis. It

extends from the pubic crest of the hipbone to the linea alba. In doing so these muscles act as antagonists and produce expiration.

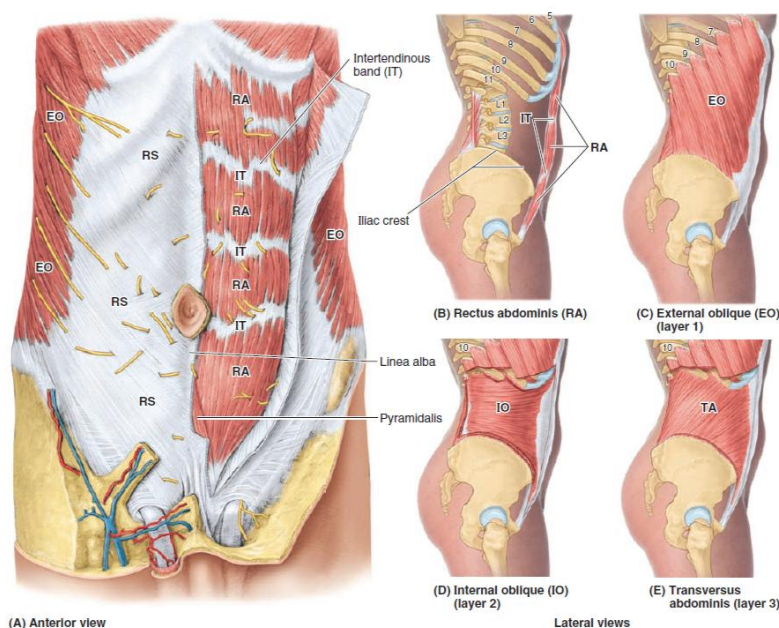


Figure 5 about here: Arteries and Nerves of Anterolateral Abdominal wall [6]

A. Right side, external oblique (EO) and intact rectus sheath (IRS); left side, opened rectus sheath, revealing rectus abdominis (RA) and pyramidalis. B. Rectus abdominis. C. External oblique. D. Internal oblique. E. Transversus abdominis.

- External oblique, the superficial muscle: Its fibers pass inferomedially and interdigitate with slips of the serratus anterior. The inferior margin is thickened as an undercurving fibrous band that spans between the anterior superior iliac spine and the pubic tubercle as the inguinal ligament.
- Internal oblique, the intermediate muscle: Its fibers fan out so that its upper fibers are perpendicular and its lower fibers are parallel to those of the external oblique.
- Transversus abdominis, the innermost muscle: Its fibers, except for the most inferior ones, run horizontally. All three flat muscles end anteriorly in a strong sheet like aponeurosis. Between the midclavicular line and the midline, the aponeurosis forms the tough rectus sheath,

enclosing the rectus abdominis. The aponeurosis interweave, forming a midline raphe (G. raphe, suture, seam) —the linea - alba (L. white line) —which extends from the xiphoid process to the pubic symphysis. The interweaving is not only between right and left sides but also between superficial, intermediate, and deep layers. For example, the tendinous fibers of the external oblique that decussate at the linea - alba, for the most part, become continuous with the tendinous fibers of the contralateral internal oblique, forming a two bellied muscle sharing a common central tendon. These two muscles work together to flex and rotate the trunk. [7]

- Rectus abdominis, a long, broad, strap - like muscle that is mostly enclosed in the rectus sheath The muscle fibers of the rectus do not run the length of the muscle; rather, they run between three or more tendinous intersections, which are typically located at the level of the xiphoid process of the sternum, the umbilicus, and a level

halfway between these points. Each intersection is firmly attached to the anterior layer of the rectus sheath.

- Pyramidalis, a small triangular muscle (absent in about 20% of people) that lies in the rectus sheath anterior to the inferior part of the rectus abdominis. It arises from the pubic crest and attaches along the linea - alba, which it tenses.

Functions and actions of the anterolateral abdominal muscles [8]

The muscles of the anterolateral abdominal wall: -

- Form a strong expandable support for this region
- Protect the abdominal viscera from injury
- Compress the abdominal viscera to maintain or increase intra - abdominal pressure. Compressing the abdominal viscera and increasing intra - abdominal pressure elevates the relaxed diaphragm to expel air, for example, during respiration, coughing, and voluntary eructation (burping). When the diaphragm contracts during inspiration, the anterolateral abdominal wall expands as the muscles relax to make room for the viscera that are pushed inferiorly.
- Produce the force required for defecation (evacuation of fecal material from the rectum), micturition (urination), vomiting, and parturition (childbirth)
- Produce anterior and lateral flexion and rotation of the trunk and help maintain posture. The rectus sheath is formed by the interlaced aponeurosis of the flat abdominal muscles. Superior to the arcuate line (about one third of the distance from the umbilicus to the pubic crest), the rectus abdominis is enveloped by the anterior layer of the rectus sheath, formed by the external oblique aponeurosis and the anterior lamina of the internal oblique aponeurosis, and posterior layer of the rectus sheath, formed by the posterior lamina of the internal oblique aponeurosis and the transversus abdominis aponeurosis. Inferior to the arcuate line, the aponeurosis of all three muscles, external and internal oblique and

transversus abdominis, pass anterior to the rectus abdominis to form the anterior rectus sheath, leaving only the transversalis fascia to cover the rectus abdominis posteriorly. The arcuate line then often demarcates the transition between the posterior rectus sheath covering the superior three quarters of the rectus abdominis proximally and the transversalis fascia covering the inferior quarter.

The contents of the rectus sheath are the rectus abdominis and pyramidalis muscles, the anastomosing superior and inferior epigastric arteries and veins, the lymphatic vessels, and the thoraco - abdominal and subcostal nerves (distal portions of the anterior rami of spinal nerves T7-T12), which supply the muscles and overlying skin.

The Rectus Sheath [9]

A Rectus sheath is an aponeurotic sheath covering the rectus abdominis. It has two walls - anterior and posterior. The anterior layer of the rectus sheath is formed by the external oblique aponeurosis and the anterior lamina of the internal oblique aponeurosis, and a posterior layer of the rectus sheath is formed by the posterior lamina of the internal oblique aponeurosis and the transversus abdominis aponeurosis. The aponeurosis of all three muscles passes anterior to the rectus abdominis to form the anterior rectus sheath and only the transversalis fascia covers the rectus abdominis posteriorly. The arcuate line determines the transition between the posterior rectus sheath wrapping the superior three - quarters of the rectus abdominis proximally and the transversalis fascia wrapping the inferior quarter.

Rectus abdominis and pyramidalis muscles, the anastomosing of superior and inferior epigastric arteries and veins, the lymphatic vessels, and the distal portion of the anterior rami of spinal nerves T7 - T12, which supply the muscles and overlying are the contents of the rectus sheath.

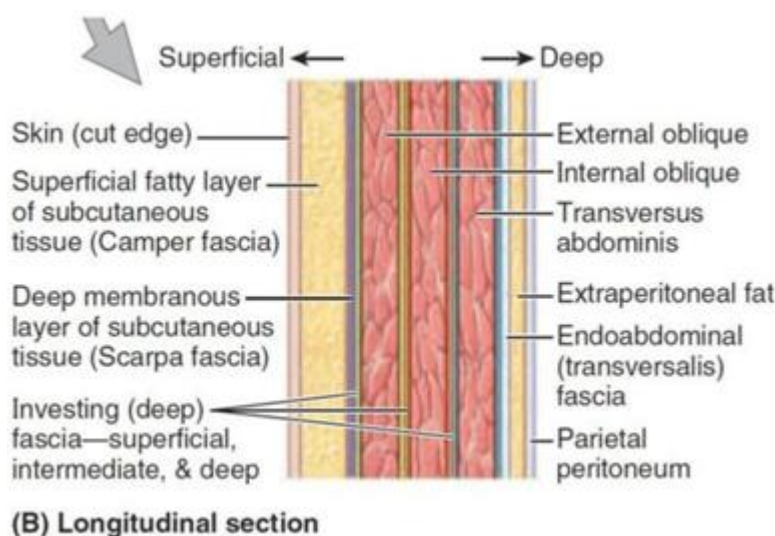
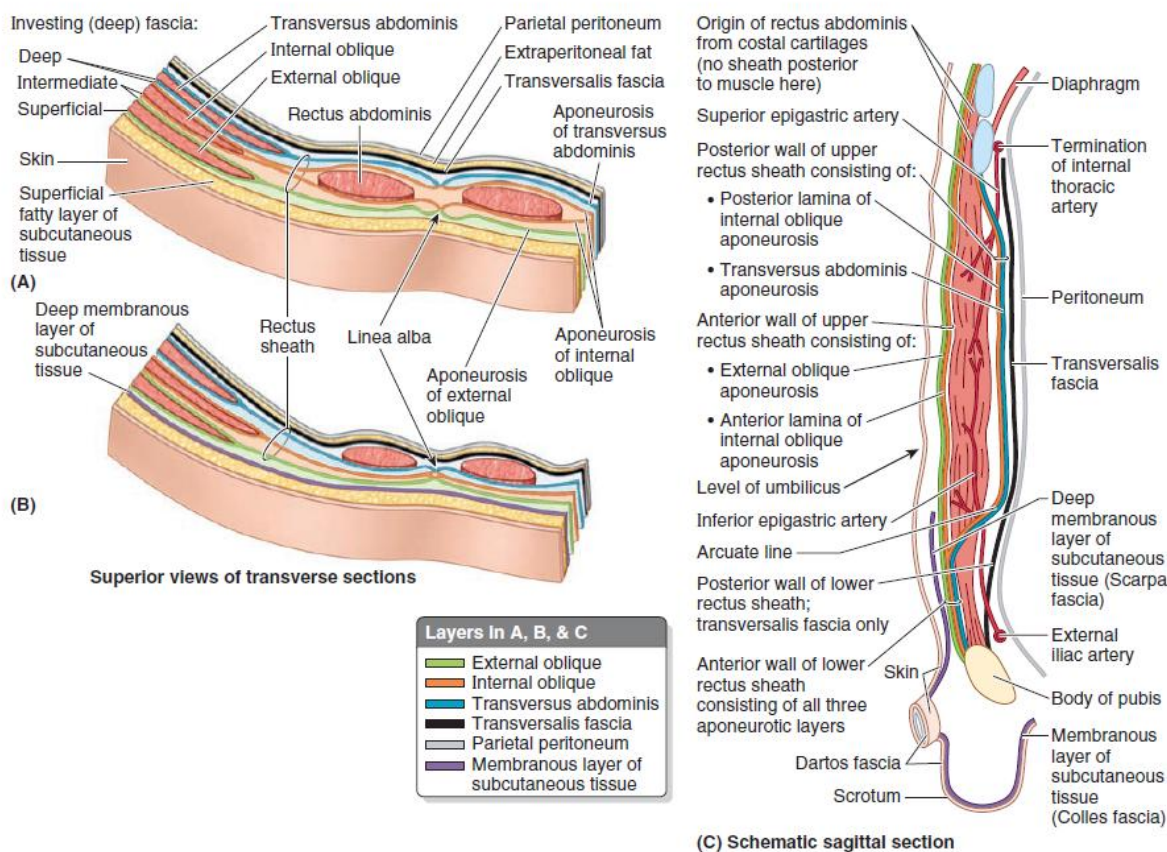


Figure 6 about here: - Fascia of anterior abdominal wall [10]

The fascial layers from superficial to deep include the subcutaneous tissue (superficial fascia), which lies deep to the skin and contains a variable amount of fat. Inferior to the

umbilicus, the subcutaneous tissue is composed of two layers: a superficial fatty layer (Camper fascia) and a deep membranous layer (Scarpa fascia).

Figure 7 about here: - Structure of anterolateral abdominal wall. [11]



A. Transverse section superior to umbilicus. B. Transverse section inferior to umbilicus. C. Sagittal section. Planes of sections for A and B are shown in Figure.

The infra - umbilical part of this surface of the wall exhibits several peritoneal folds, some of which contain remnants of vessels that carries blood to and from the fetus (Moore et al., 2012). Five umbilical peritoneal folds—two on each side and one in the median plane—pass toward the umbilicus.

- The median umbilical fold, extending from the apex of the urinary bladder to the umbilicus, covers the median umbilical ligament, the remnant of the urachus that joined the apex of the fetal bladder to the umbilicus.
- Two medial umbilical folds, lateral to the median umbilical fold, cover the medial umbilical ligaments, formed by the occluded parts of the umbilical arteries.
- Two lateral umbilical folds, lateral to the medial umbilical folds, cover the inferior epigastric vessels and, therefore, bleed if cut. The depressions lateral to the

umbilical folds are peritoneal fossae, some of which are potential sites for a hernia. The location of a hernia in one of these fossae determines how the hernia is classified. The shallow fossae between the umbilical folds are the figure shown above

- Supravesical fossae between the median and the medial umbilical folds, formed as the peritoneum reflects from the anterior abdominal wall onto the bladder. The level of the supravesical fossae rises and falls with filling and emptying of the bladder.
- Medial inguinal fossae between the medial and the lateral umbilical folds, areas also commonly called inguinal triangles (Hesselbach triangles). These are potential sites for direct inguinal hernias.
- Lateral inguinal fossae, lateral to the lateral umbilical folds; these include the deep inguinal rings and are potential sites for the most common type of inguinal hernia, the indirect inguinal hernia.

Table 2: Nervous innervation of Anterior Abdominal wall [12]

Nerves	Origin	Course	Distribution
Thoraco abdominal (T7 - T11)	Continuation of lower Intercostal nerves	Running between a second and third layer of abdominal muscles; lateral cutaneous and anterior cutaneous branches enter subcutaneous tissue.	Anterolateral abdominal wall muscles and overlying skin
Subcostal	Anterior ramus of the L1 spinal nerve.	The inferior border of 12th rib, then onto sub umbilical abdominal wall	Muscles of the anterolateral abdominal wall and overlying skin are superior to the iliac crest and inferior to the umbilicus.
Iliohypogastric (L1)	Anterior ramus of T12 spinal nerves	Innervates transversus abdominis muscle; branches pierce external oblique aponeurosis of the most inferior abdominal wall	Skin overlying iliac crest, upper inguinal and hypogastric regions; internal oblique and transversus abdominis
Ilioinguinal	Anterior ramus of	Between second and third layers of abdominal	The skin of scrotum or labium majus, mons pubis,

(L1)	L1spinal nerve	muscles, then traverses inguinal canal	and adjacent medial aspect of the thigh; most inferiorinternal oblique and transversusabdominis
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Anterolateral Abdominal Wall Vessels: Superior epigastric vessels and branches of the musculophrenic vessels. These are branches of internal thoracic vessels. Inferior epigastric and deep circumflex iliac vessels. These are branches of external iliac vessels. Superficial circumflex iliac and

superficial epigastric vessels. These are branches of the femoral artery and great saphenous vein Posterior intercostal vessels in the 11th intercostal space and anterior branches of subcostal vessels.

Table 3: Principal arteries of anterolateral abdominal wall [13]

Arteries	Origin	Course	Distribution
Musculophrenic artery	Internal thoracic artery	Rundown along costal margin	Abdominal wall of the hypochondriac region, anterolateral, diaphragm.
Superior epigastric artery	Internal thoracic artery	Rundown in rectus sheath deep to rectus abdominis	Rectus abdominis and superior part of anterolateral abdominal wall
10th and 11th posterior intercostal arteries Subcostal artery	Aorta	Arteries continue outside ribs to descend in abdominal wall between the internal oblique and transversus abdominis	Abdominal wall, lateral region.
Inferior epigastric artery	External iliac artery	Runs up and enters rectus sheath; runs deep to rectus abdominis	Rectus abdominis and medial part of anterolateral abdominal wall
Deep circumflex iliac artery	External iliac artery	Runs deep in the anterior abdominal wall, parallel to the inguinal ligament	Iliacus muscle and inferior part of the anterolateral abdominal wall
Superficial circumflex iliac artery	Femoral artery	Runs in superficial fascia along the inguinal ligament	Superficial abdominal wall of inguinal region and adjacent anterior thigh
Superficial epigastric artery	Femoral artery	Runs in the superficial fascia on the way to the umbilicus	Subcutaneous tissue and skin over the pubic and inferior umbilical region.

Peritoneum and its cavity [14]

The peritoneum is large. the glistening, transparent serous membrane lining the abdominal cavity and it is consisting of two continuous layers. It is lining the internal surface of the abdominopelvic wall. Visceral peritoneum, investing viscera (organs) such as the spleen and stomach. The peritoneal cavity is within the abdominal cavity and continues into the pelvic cavity. It is a potential space of capillary thinness between the parietal and visceral layers of peritoneum. The peritoneal cavity contains a thin film of peritoneal fluid that keeps the peritoneal surfaces

Asana and pranayama practice definitely generates energy, but *Nauli* activates the system in a much shorter time and with greater force. Its effects are particularly noticeable on the digestive and excretory systems. It generates heat in the body, stimulates digestion, assimilation and absorption, thereby reducing excretion. It balances the endocrine system and helps control the production of sex hormones. [16]

Shatkarma is *Hathyogic practice*, and its main goal is to prepare the body physically and mentally for advanced Yogic practices by eliminating toxins as the body is that tool through which one can achieve all his divine purposes.

Table 4

Type of peritoneal organs	Meaning	Examples
Intraperitoneal organs	They are Completely covered byperitoneum	Spleen, stomach
Extraperitoneal organs, Retroperitoneal organs, Subperitoneal organs	Outside the peritoneal cavity Posterior to the peritoneal cavity Partially covered with theperitoneum	Kidney, Pancreas

3. Discussion

Shatkarma and asanas stimulate digestion, but *nauli* is said to be the best for this. It quickly tones the abdominal muscles, nerves, intestines, reproductive, excretory and urinary organs. In fact, there is not one part of the internal system which is not stimulated by this practice. When the abdominal muscles are manipulated, not only are they toned, but all the internal organs are massaged. [15]

Nauli Kriya not only strengthens and fortifies the abdominal muscles; it also helps enhance blood supply to the abdominal viscera and also activates the nervous plexus of the abdomen and their nerve endings. *Nauli Kriya* helps in removing the impurities and toxins of the intestines and detoxifies them. It fine tunes the digestive system and keeps it healthy; it has a regulating and stimulation effect. *Nauli* accelerates the gastric secretions which in turn aid in good digestion. It activates and motivates the abdominal visceral organs and keeps them active and going.

In the above described anatomy, *Nauli Kriya* involves the organ components of the abdominal area, but its effect is on every system of the body. The abdomen has a root of the digestive system (main organs like stomach, small and large intestine), Genitourinary system (kidneys, ureters, bladder), reticuloendothelial system (spleen), nervous system (coeliac

plexus, lumbar plexus, longest vagus nerve, sympathetic ganglion, autonomic plexuses), main glands of the endocrine system (adrenal glands, pancreas), chief muscle of respiration (diaphragm), involvements of the cardiovascular system (IVC, portal veins, thoracic aorta, and its branches), channels of the lymphatic system (cisterna chyli) and musculoskeletal system. (Muscles of the anterior abdominal wall) all these structures are participating and can be manipulated through *Nauli Kriya*. Everyone knows that developing strength, improving aerobic capacity, and increasing flexibility is important for physical conditioning. The question of how to accomplish these goals is less certain, but yogis insist that these are the benefits of *uddiyana bandha*, and *nauli*. For example, we can note that any activity that increases intra - abdominal pressure while the airway is being kept open will force blood more efficiently than usual from the venous system in the abdominal region up into the chest. Quantities can be debated, measurements taken, and opinions stated. *Nauli* helps the lungs regain and maintain its elasticity, owing to the profound inhalations and exhalations you do while doing *Nauli* procedure. It helps in getting rid of menstrual irregularities in women. It wards off the weakness of the genital system. It has a preventive effect against diabetes. *Nauli* provides immunity towards and helps in preventing hernia, appendicitis, ulcer, constipation, indigestion, ulcer etc. *Nauli Kriya* is often said to be (remedy for all diseases) makes a man physically and mentally alert, strong and fit.

Nauli Kriya is creating negative pressure in the abdominal cavity and leads the abdominal arteries to carry more blood to all organs this increased blood supply can help organs to work at their optimal level and this increased blood supply can also help organs in their fast and rapid recovery from daily wear and tear and also help them do fight with the condition of the disease by fast and effective drainage of waste materials. [17]

The gut and brain have a strong relation in the means of emotional behavior of a person. The enteric nervous system is considered the second brain and communicates with the brain. [18] Anxiety and stress can shoot up digestive problems and good gut health can help to solve anxiety and stress problems alike. The major stress hormones adrenaline, nor - epinephrine, and cortisone are secreted by the adrenal glands and this gland is located at the upper pole of the kidney in the abdominal cavity. So, by *Nauli Kriya* we can also manipulate all these endocrine and nervous components as it gives a massage to all the internal organs of the abdominal cavity. The coeliac plexus is a component of the enteric nervous system and gives autonomic supply to the stomach, pancreas, liver, and most of the abdominal organs. So, by stimulating the coeliac plexus we can regulate the secretion of digestive enzymes by the stomach, pancreas, and liver and stimulate the digestive fire which regulates digestion. Hence, *Nauli Kriya* is not only effective on a physical level but also mental level and helps to treat diseases by controlling all the systems of the body.

4. Conclusion

Nauli Kriya is a very beneficial cleansing process of *Hatha Yoga practices* useful for alleviating constipation,

indigestion, nervous stress, diarrhea, acidity, flatulence, depression, hormonal imbalances, sexual and urinary disorders, laziness, dullness, lack of energy and emotional disturbances. Through its practice one can control one's appetite and sensual desires and strengthen one's willpower. If this can be attained, the practitioner will definitely find deeper satisfaction within.

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