

The Gastroesophageal Junction & Hiatal Hernia – General Information

Definition of Hiatal Hernia: When some portion of the stomach passes into the thorax through the esophageal opening of the diaphragm.

The gastroesophageal junction is located where the thorax meets the abdomen. This is an area where many conflicting forces meet. Above it the powerful force of the negative intrathoracic pressure attracts the subdiaphragmatic organs upward and from below, the positive pressure of the abdominal cavity draws the abdominal organs downward, making the risk for mechanical dysfunction substantial.

Along with the stresses associated with the supra and subhiatal pressures, the gastroesophageal junction must function while following the continual motion of the diaphragm. The diaphragm completes approximately 24,000 movements a day, pushing and pulling the lungs and the abdominal viscera along with it each time.

The slightest offset in balance of tensions, over time can lead to a wearing away of the supportive structures, such as the phrenoesophageal ligament, which helps to stabilize and position the lower esophagus in relation to the diaphragmatic hiatus. In this area, the negative pressure of the thorax is so powerful, it will always win out over the positive abdominal pressure, drawing the stomach upward, leading to a hiatal hernia.

An offset in this important balance of tensions or any restriction that affects the transmission of impulses into and away from this area, can occur through a restriction in the thorax, abdomen or pelvis such as from surgery, injury, infection, lifestyle, etc..

Neurohormonal alterations can affect the tone of this sphincter impacting the balance of pressures and tensions.

Common causative states are depression and pregnancy. Certain drugs can alter tone in this area, including such things as oral contraceptives, antidepressants, tranquilizers, sedatives, cigarettes including foods such as chocolate, mint, citrus fruits, coffee, wine, and sulfites.

Surface Projections:

Anterior: near the sternum on the left seventh costal cartilage.

Posterior: approximately T11 (the left costovertebral joint).

Associated Skeletal Restrictions:

Left side cervical spine and sternoclavicular joint, left 11th costovertebral joint, left 7th rib, T12-L3.

Kidneys – General Information

Within each kidney are one million nephrons that filter our blood of toxic wastes. Together, both kidneys contain 140 miles of tubing.

Every 24 hours, 1,700 liters of blood are sent to the kidneys via the renal arteries. From this, 170 liters of filtrate leave the blood stream and enter into the kidney parenchyma. Of this 170 liters, 99% is resorbed back into the bloodstream and the remaining 1-2 liters are eliminated from the body as urine.

During an average breath, the kidneys move ~2.5-3cm. With an average of 24,000 breaths per day, the kidneys move 600-700 meters (just under .5 miles) per day.

Vascularization

Artery: renal arteries via abdominal aorta.

Vein: renal veins via inferior vena cava.

Innervation

Sympathetic: cord level T10-T12, L1, through splanchnic nerves to renal plexus; formed by celiac ganglion and plexus, aorticorenal ganglion, and aortic plexus.

Parasympathetic: right and left vagus nerves, joining the renal plexus.

General listening

Side bending towards kidney, then external rotation with forward bending.

Emotional/Psychological

Deep seated energy reserves to overcome existential fear (firmly rooted). The need to lead.

The right kidney: associated with frustrated, intense anger. It relates to events “too emotional” for the liver.

The left kidney: expresses our deepest power of being. It reflects not only the life that was given to you, but the life you transmit. It also can involve emotions around gender and sexuality.

Approximate size:

Length: 12cm (5 in.)

Width: 7cm (3 in.)

Thickness: 3cm (1 ¼ in.)

Location (general limits):

Superior limit: T11

Pelvis: T12-L11

Inferior limit: L3 (right kidney can be at L4 with a 3rd degree ptosis)

The right kidney is typically 1-2cm lower than the left.

Superior poles: 6-7cm apart (3 in.)

Inferior poles: 10-12cm apart (4-5 in.)

Spleen – General Information

Located posterior to the left mid-axillary line, following along ribs 9-11.

Vascularization

Artery: pancreatic arteries, branching from celiac trunk and splenic artery.

Vein: splenic vein, joining superior mesenteric vein to form portal vein.

Innervation

Sympathetic: celiac plexus and left celiac ganglion to splenic plexus.

Parasympathetic: right vagus, joining the celiac, then splenic plexus.

General listening

Forward bending and left side bending.

Emotional/Psychological

Similar to the pancreas. A more reserved type of grief. Reacts to serious events that can upset a person for life.

Along with the pancreas it absorbs the most severe shocks. Deep sadness. Examples: Deep disappointment, disappointment in humanity.

General signs/symptoms of spleen disorders

Neck pain, left thoracic pain.

Red Flag: Enlarged supraclavicular nodes, weakness, fatigue, abdominal pain, paleness, spleen enlarged (easily palpated).

Splenectomy: The liver compensates for the loss as it shares many of the same functions.

Function

- ⇒ Blood cleansing:
 - Destroys old/fragile red blood cells
 - Phagocytosis of damaged RBCs and any debris, bacteria, parasites, etc. in the blood.
- ⇒ Stores RBCs and releases them when needed (e.g., strenuous exercise, muscle demanding more oxygen)
- ⇒ Immune function – the same as lymph glands
 - Properdin - helps in inflammatory response and phagocytes to engulf their target and neutralizes some viruses.
 - Opsonins - A binding enhancer, helps phagocytosing cells to recognize and bind to their target
 - Tuftsin - helps macrophages and PNC to migrate, phagocytize and also gives them bacteriocidal and tumoricidal activity as well as influencing antibody formation

⇒ Hemopoietic activity in the fetus

Pancreas – General Information

Vascularization

Artery: celiac trunk to splenic and pancreaticoduodenal arteries.

Vein: superior mesenteric and splenic veins to portal vein.

Innervation

Sympathetic: cord level T5-T9; greater splanchnic nerves; celiac plexus.

Parasympathetic: right vagus, joining the celiac plexus.

General listening

Forward bending, then left side bending and right rotation.

Emotional/Psychological

Linked to the stress involved when a person has great difficulty accepting/integrating. Examples: Violence, breakups of relationship/family, death of a child, illness, profound injustice, meeting ones own mortality.

General signs/symptoms of pancreatic disorders

Fatigue after eating, hypersensitivity to smells, upper abdominal discomfort, T9 restriction, T9-T11 back pain, left SI joint fixed, left scapular irritation especially after a large meal.

Exocrine function

Digestive enzymes and bicarbonate ions from the pancreas travel to the duodenum via the pancreatic duct and sphincter of Oddi. In the duodenum the digestive enzymes are activated and function to break down carbohydrates, proteins, and fats. Bicarbonate ions neutralize the acidic chyme.

Endocrine function

Specialized cells in the Islets of Langerhans produce and secrete hormones (Beta cells - insulin and Alpha cells – glucagon). Insulin enables glucose in the blood to move into the cells (tissues), promoting carbohydrate metabolism. Glucagon mobilizes glucose from the liver when blood glucose levels are low (preventing hypoglycemia).

Peritoneum – General Information

The peritoneum, the largest and most complex of the serous membranes, is an empty and intricately folded sac, lining the abdomen and reflected over the viscera. Where it lines the abdominal wall (parietes) it is named parietal peritoneum, and is reflected over the viscera as visceral peritoneum.

There is approximately 50ml (1.7oz or about ¼ of a cup) of serous fluid between the parietal and visceral layers. Inflammation creates increased secretion of serous fluid and increased viscosity, leading to a risk of adherence to neighboring structures.

Within the abdominal cavity is a dynamic balance of pressures between the high pressure of the organs and the low pressure of the peritoneal cavity. With high pressure always moving toward low pressure (turgor), the parietal and visceral layers are constantly hunting the largest area of contact between them.

Vascularization

Parietal Peritoneum: Supplied by somatic blood vessels of the abdominal and pelvic walls.

Visceral Peritoneum: Derives its blood vessels from those supplying the viscera.

Innervation

Parietal peritoneum's nerve supply is derived from nerves supplying the muscles and skin of the parietes.

It receives sensory innervation from the phrenic nerve, vagus nerve and lumbar plexus. Highly reflexogenic; treating the parietal peritoneum affects the ANS resulting in increased circulation and decreased viscerospasm of the related organs.

Visceral peritoneum's nerve supply is autonomic; same as those supplying the viscera.

Greater Omentum – General Information

The greater omentum is richly supplied with blood and lymph vessels and contains a considerable number of lymph nodes. It has the ability to isolate an area of slowly developing inflammation, such as chronic appendicitis, preventing the spread of infection to the peritoneal cavity as a whole. It stores fat, which insulates and provides a long-term energy store.

It attaches from the greater curvature of the stomach and the first part of the duodenum, draping inferior to cover the jejunoleum for a variable distance and ascends behind itself as far as the transverse colon, where it attaches. The right border extends to the commencement of the duodenum and the left border is continuous with (and actually the same structure as) the gastrosplenic ligament.

Vascularization

Artery: A wide anastomotic arc formed by the right and left gastroepiploic (gastro-omental) arteries, via the splenic and hepatic arteries.

Vein: Anastomotic arc formed by the right and left gastroepiploic veins, to the superior mesenteric and splenic veins.

Innervation

Sympathetic: Cord level T6-T10, through splanchnic nerves to celiac plexus, to plexus on right and left gastroepiploic arteries.

A compilation of associated skeletal restrictions and referred pain patterns for the VM1 organs:

Liver	<i>VM pg 107; VMII pg 112-113</i>
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	C4-C5 (right side or bilateral)
	Right scapula
	Right glenohumeral peri-arthritis
	Cervical / brachial plexi and associated fascia
	T7-T10
	Rib 7-10, lower ribs and right costovertebral articulations
	Cranial base restrictions (right side)
	Frontal / nasal articulation (right side)
	Left sciatica (venous hepatic origin)
	Right sciatica – related to restrictions of hepatic fascia, right kidney, ascending colon
Stomach	<i>VM pg 134; VMII pg 61-62, 83</i>
	Cervical vertebrae (left side with left sternoclavicular joint)
	Glenohumeral peri-arthritis (left side)
	T6-T11
	T6 left costovertebral articulation (stomach dermatome)
	T11 left costovertebral articulation (hiatal region)
	Rib 7 (left side)
	T12-L3 (diaphragmatic crura)
	Sacroiliac joint (left side, related to L1)
Duodenum	<i>VM pg 156; VMII pg 83</i>
	T12-L1 (more often on the right)
Gallbladder	<i>VM pg 107; VMII pg 136-137</i>
	C4-C6 (left side)
	C4 (transverse process)
	T7-T9 (right costovertebral articulations)
Jejunioileum	<i>VM pg 156; VMII pg 185-186</i>
	T10-T12
	Acute or chronic low back pain
	Sciatica (left side – venous circulation problems)
	Joint pain of the lower limbs
Large Intestines	<i>VM pg 183; VMII pg 185-186</i>
	Acute or chronic low back pain
	Sciatica (left side – venous circulation problems)
	Sciatica (right side – cecum)
	Varicose veins (left side)
	Joint pain of lower limbs
	Glenohumeral peri-arthritis (flexures)

A compilation of associated skeletal restrictions and referred pain patterns for the VM2 organs:

Kidney	<i>VM pg 151; VMII pg 189</i>
	T11 and T12 and corresponding costovertebral articulations (“entire region of T10-L1 may

	be involved”)
	“Neurological reflexes may involve T6/T7 and L1/L2.”
	Lower ribs
	Coccyx
	“...superior tibiofibular joint or cuboid articulation.”
	1° and 2° ptosis will have corresponding restrictions at T7 and T11 and their ribs and at L1-L3
	Knee irritation due to femoral nerve (saphenous)
	Restrictions in navicular, first cuneiforms and fifth metatarsal bones (reflexogenic)
	Lower limbs due to contractions of psoas muscle
	Glenohumeral periarthritis – Right (abnormal tensions in fascial system); Left (reflex origin)
	Mechanical renal injury can decrease ipsilateral blood pressure. Problems with parenchyma can increase blood pressure.
	“The Adson-Wright test is often positive on the affected side with first and second degree ptosis.”
Pancreas	<i>VMII pg 136</i>
	T9
	L2 restriction
	Acute back pain around T9-T11 especially on left
	Sacroiliac joint on left
	“Acute and, more rarely, chronic low back pain.”
	“Retroscapular projection on insertion of levator scapulae muscle... usually on the left...” Left scapular point – injury to pancreatic body; right scapular point with no retroscapular projection of gallbladder – exocrine pancreas.
Spleen	JP Barral does not discuss this.

**Use your listening techniques (GL, LL, motility eval) as your primary tool for evaluation and assessment. After that, this list can be helpful to understand how the restrictions you found are impacting the body.