

'To taste someone's kidneys = investigating if something is really true'

'In heart and kidney (Eng. Heart & Soul) = with full conviction'.

Dutch proverbs



11. REN

11.10. OSTEOPATHY REN

Biomechanics: Mobility Ren

Within the fascia Peri-renalis, the kidney can move under the influence of breathing and posture.

With normal breathing, the kidney travels a distance of 700 meters per day.
 Inspiration: descensus 1,5 cm / expiration ascensus 1,5 cm —> 3 cm
 $3 \text{ cm} \times 16 / \text{min} \times 60 / \text{hr} \times 24 \text{ hours} / \text{day} \approx 700 \text{ meter.}$

Decrease in peri-renal fat increases kidney mobility, fixation of the fascial system reduces it.

- The Fascia Gerota Anterior is thin and smooth and provides a gliding option.
- Posterior Fascia of Gerota (Zuckermandl) is a hard fibrous structure and serves as protection (blow or bump).
- Fascia attach to the lumbar vertebrae, which can be a cause of discal / radicular pain syndromes.

Increased mobility of the kidney can lead to ptosis.

The kidney moves over the M. Psoas to the caudal with each inspiration.

More meticulous: Caudal (Pressure Diaphragm).
 Lateral (position of the M. Psoas).
 Ventral (position of the M. Psoas).
 With a little endorotation (due to the blood vessels).

Vitality (Motility) Ren

The motility of the kidney is related to embryonic development. That is, the final embryonic development of the metanephros.

ER: Cranial ascending motion, slightly posterior and slightly exorotation.

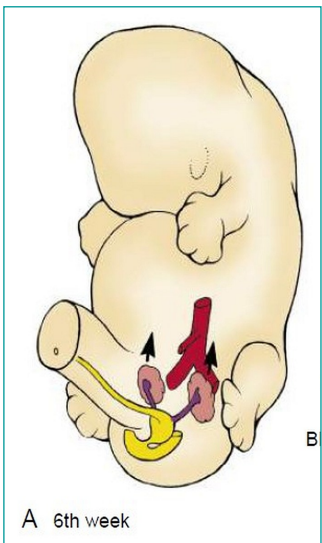
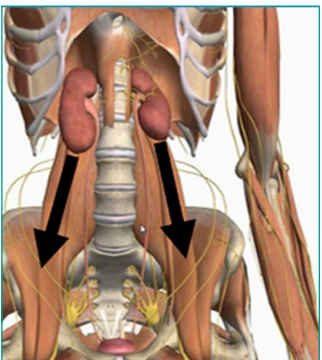
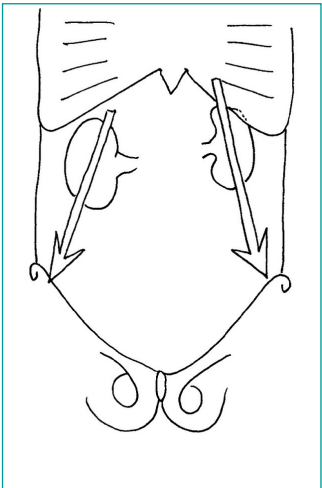
The ER movement in Vitality is opposite to the movement of the kidney in Inspiration.

Autonomy (Motricity) Ren

The kidney has its own autonomous 'movement', or rather flow.

- The filtration in the Glomerulus: from 1.2 litres of blood or 600 ml of plasma per minute, approximately 125 ml of pre-urine filtrates into the urine pool.
- The resorption in the tubule and Henle's loop is partly an active process.
- Eventually, the urine reaches the renal calyces through the contractions of the sphincteri Calices and Fornices (see paragraph 11.2. Urinary drainage).

After collection and pressure rise in the renal pelvis, the wave movements (cystoids) in the ureter follow the urine to the bladder.



Osteopathic dysfunctions Ren

1. M. Psoas

'The M. Psoas is the rails for the kidney-train'.

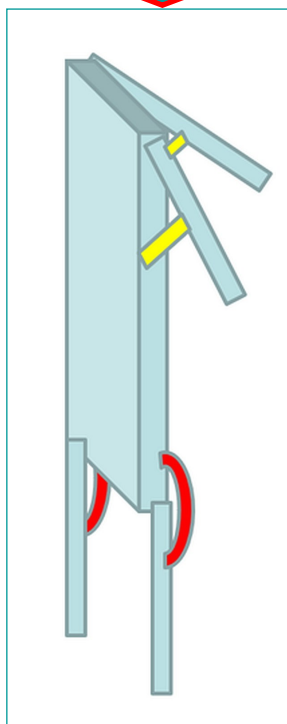
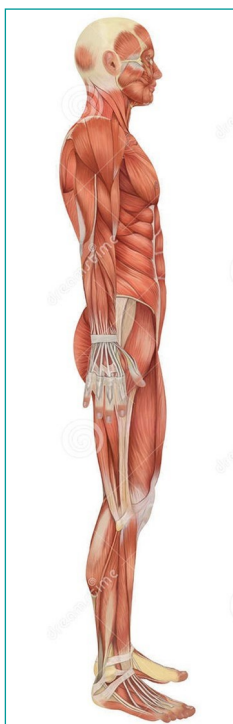
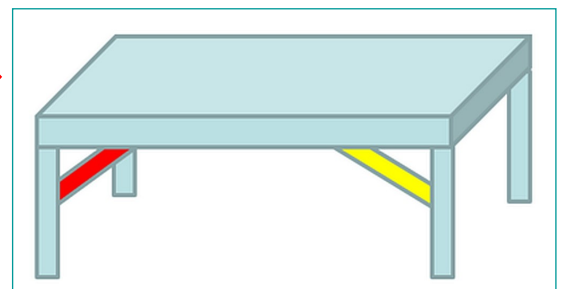
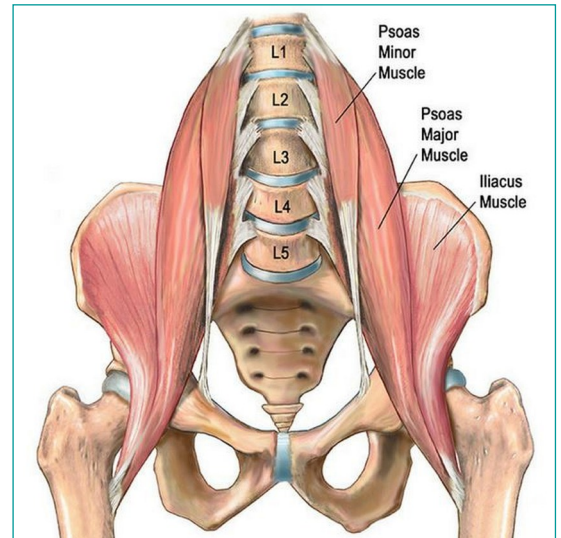
From an osteopathic perspective, the kidney and the M. Psoas Major form a functional unit. The M. Psoas forms a 'rail' over which the kidney travels like a 'train' to caudo-ventro-lateral with Inspiration.

As mentioned, the kidney is a very mobile organ, covering about 700 meters per day in distance. Incidentally, most organs, such as the heart, lungs, intestines, stomach, etc., move many times more.

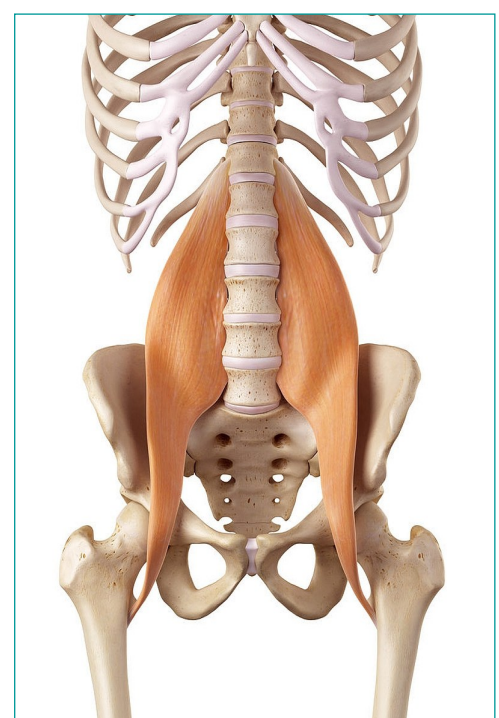
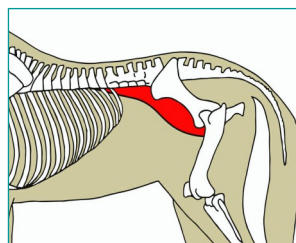
The M. Psoas Major is 'the tenderloin' for many animals, such as pork tenderloin or beef tenderloin. Due to its frequent use, it remains tender and well circulated, because the M. Psoas is used with every step.

However, there is something 'wrong' with the upright person. If we think of a four-legged friend as a folding table with folding legs, the M. Psoas Major forms the diagonal support for the hind legs.

In the upright human, however, the hind legs are 'folded' to dorsal. As a result, the M. Psoas is always over-stretched and has a 'worse momentum' for strength in humans.



At the collapsible legs of the 'folding table', the cranial side remains the same (yellow line), but (embryonic) caudal extension and endorotation (red line) has taken place. The M. Psoas is already overstretched.

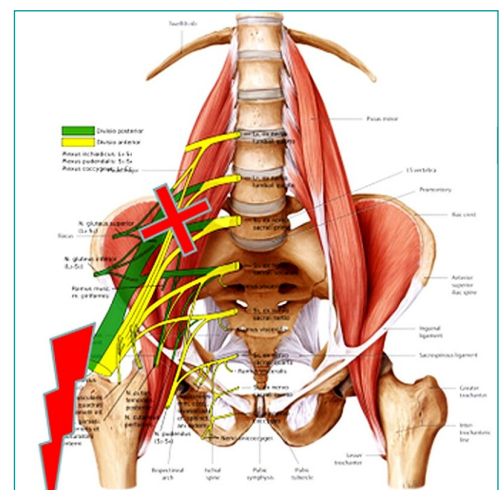
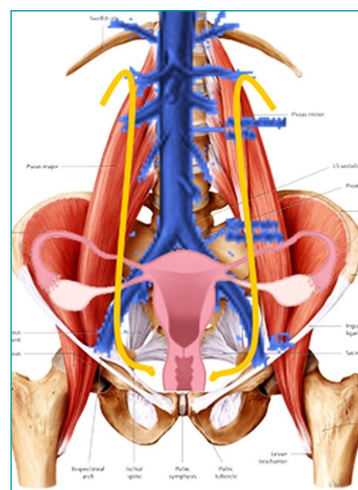
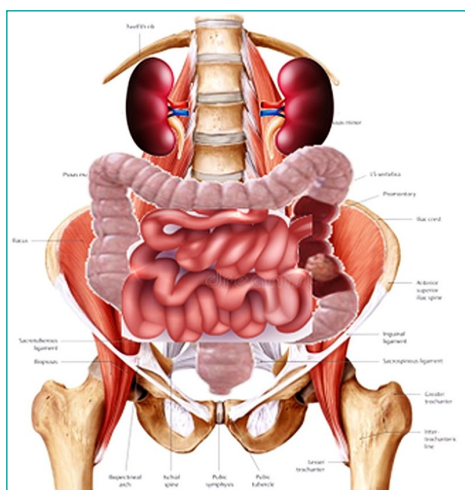
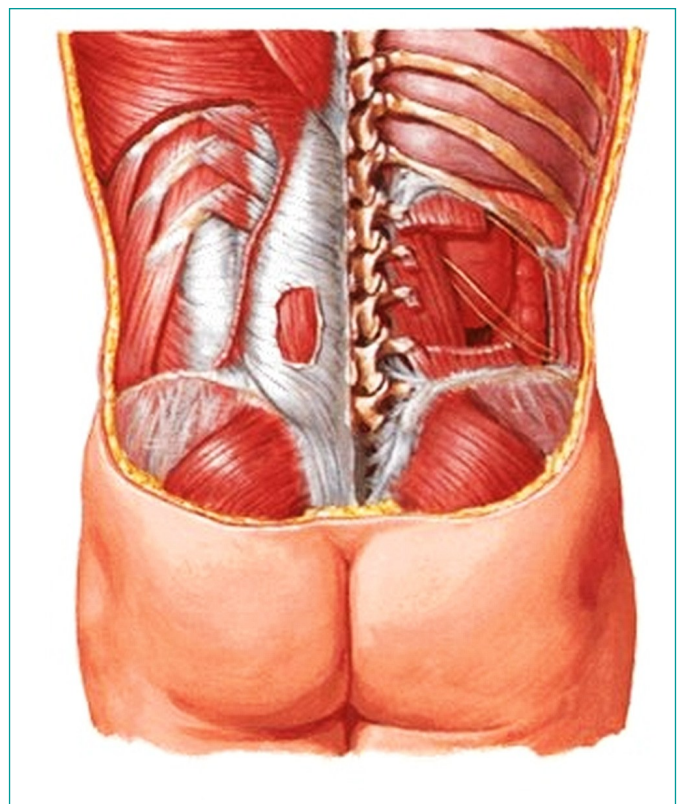
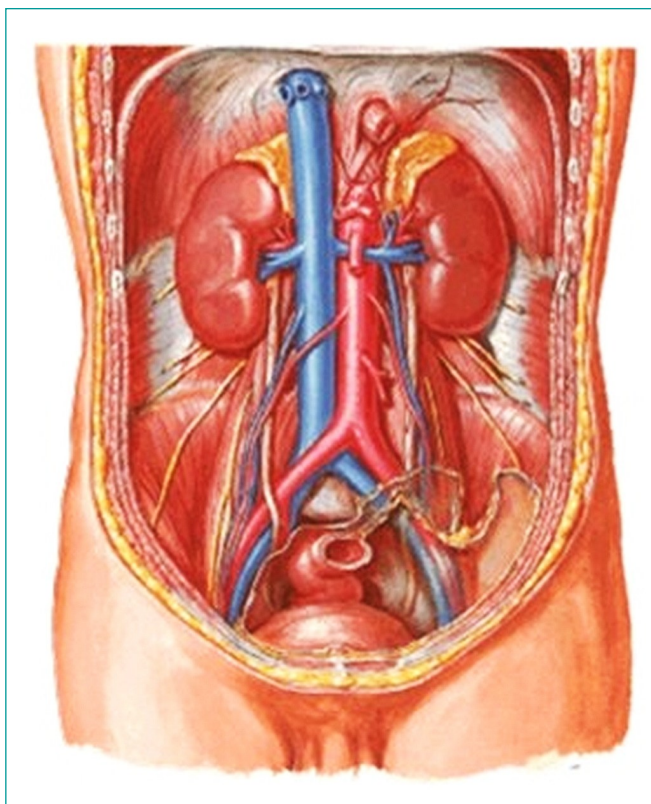


From an osteopathic perspective, in addition to the 'reduced mechanical leverage function' (upright standing), it is important to realize that many organs (Colon, Intestinum, Ovaria, etc.) are also located on the M. Psoas Major and that many nerves run from the Lumbosacral Plexus posterior and anterior of it.

In itself, the M. Psoas Major is an important representative of low back pain, but this muscle is itself a 'victim' of:

- Stand up straight and walk upright;
- Fascial connection to many organs;
- Position of the lumbosacral plexus.

Attention to this muscle is in order, as well as treatment and homework exercises for the patient at home. However, don't forget to examine the causal relationships and, if necessary, treat them.



2. Kidney ptosis (nephro-ptosis)

The kidney can prolapse due to a range of causes, such as:

- Sedentary occupation —> too little longitudinal tension in the perirenal fascia;
- Too little exercise —> activity M. Psoas Major;
- Decrease pararenal fat —> excessive weight loss (too quickly);
- Different sports: Motorcycling (vibration of the engine block);
Horseback riding (especially with the wrong posture: impact);
(Kick)boxing —> punch on the region;
Vibration plate —> therapy at physiotherapists & gyms;
Skiing —> fast downhill on mogul slope.
- Decreased abdominal pressure to retroperitoneal.

1st degree: possible compression N. Intercostalis XII.

=> pain in the course of the nerve from posterior to anterior.

Examination: Lower pole palpable.

2nd degree: possible compression N. Ilio-Hypogastricus (L₁) and / or
N. Ilio-Inguinalis (L₂).

=> pain at the level of the groin area, scrotum and labia majores.

Examination: Kidney-hilus palpable.

3rd degree: possible compression N. Genito-Femoralis (L₂) and / or
N. Cutaneo-Femoralis Lateralis (L₃).

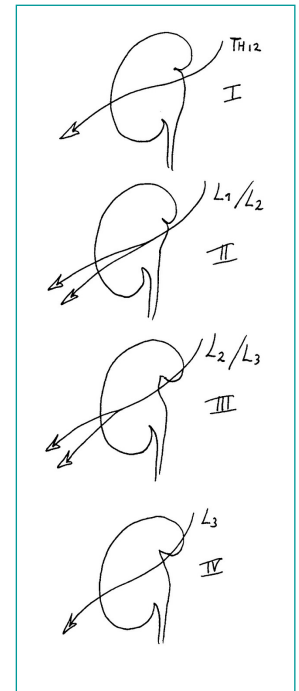
=> pain at the level of the canalis Inguinalis and on the inner thigh.

Examination: Upper pole palpable.

4th degree: possible compression N. Femoralis (L₃).

=> pain at the level of the knee (cruralgia).

Examination: Kidney palpable regio inguinalis.



Nota Bene ptosis: with palpation on examination, Glenard's pincer grip is meant.

Intermezzo adrenal glands:



Normally, the caudal movement of the kidney causes a slight traction to the adrenal glands, —> a kind of 'milking'

This is due to the stiffness of the lig. Phreno-surrenalis (the adrenal glands stay cranial while breathing) and the elasticity of the lig. Intersurreno-realis, by which the kidneys can move to caudal with inspiration.

As a result, a stimulus is constantly delivered to the adrenal gland for the production of its hormones. Of course the 'milking' is relatively speaking.

Renal ptosis causes reduced traction in the lig. Intersurreno-renalis, resulting in under-stimulation of the adrenal gland (Glucocorticoids and Adrenaline). The result is obvious: less alertness, fatigue, deregulation of self-healing, (Adrenalin and Cortisone)

From an osteopathic perspective, the kidneys reflect their dysfunction to the surrounding muscles: the M. Psoas Major, the M. Quadratus Lumborum, the long back muscles, etc.

It makes sense that the kidneys are involved in many lower back problems. Examination, and in particular the 'provocation' part, will often clarify this relationship to the patient.

3. Diaphragmatic mobility

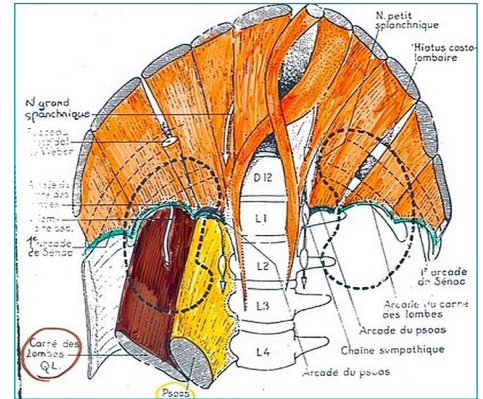
The Diaphragm forms a sheath over the kidney.

It forms a pump-suction mechanism:

- Inspiration: kidney is pushed to caudal (pump);
- Expiration: of kidney is sucked to cranial (piston).

The diaphragm 'protects' the kidney:

- Diaphragm 'fixation': kidney-movement decreases;
- Renal ptosis: the Diaphragm follows caudal (scoliosis).



From an osteopathic perspective, the Diaphragm and kidney work together, but so does the Diaphragm with other organs. The Diaphragm needs the 'back pressure' of the kidneys in order to function; The kidneys need diaphragmatic mobility to function optimally.

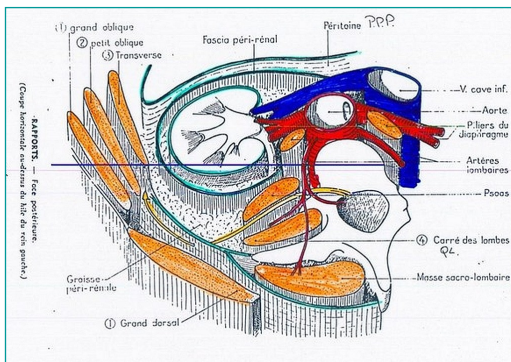
This can be one of the possible causes of idiopathic ('congenital') scoliosis. When one of the two kidneys has undergone less ascensus in the embryonic period, a low position of the Diaphragm occurs on that side, resulting in scoliosis. On the one hand, in this case it is also necessary to look much wider than the kidney and the Diaphragm. On the other hand, there are several (visceral) causes for scoliosis.

What is certain is that osteopathy can do a lot to stop or slow down the fixations that can accompany scoliosis. Whatever the causal background could cause the scoliosis.

4. Pararenal kidney-fascia

1. The renal fascia is in contact with:

- Fascia of Toldt (Colon ascendens & descendens);
- Fascia of Treitz (Duodenum);
- Peritoneum Parietal Posterior (PPP);
- Mesocolon Transversum;
- Lig. Hepatorenalis (liver);
- Lig. Phreno-reno-lienalis (spleen);
- Bursa Omentalis & Mesogastrium posterior (stomach).



The fascia of Gerota connects and right cranially at the level of the Diaphragm (fixation).

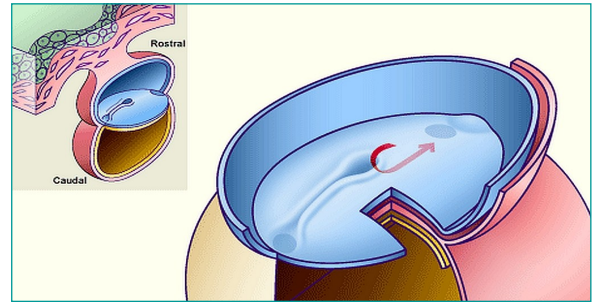
They remain open downwards:

- fossa Iliaca;
- para-vescicale fascia;
- para-rectale fascia.

The fascia contains a fluid concentration (gliding function, which can, in case of friction, cause an inflammation) and a perirenal fat mass.

From an osteopathic perspective, all fasciae are connected to each other, or rather they all originate from the same embryological lateral plate.

Part of this lateral plate runs with the ectoderm (somato-pleura, 'the parietal fascia') and another part with the entoderm (splanchno-pleura, 'the visceral fascia').



2. Posterior, the fascia of Gerota has a relationship with the fascia Transversa. This is a branch of the fascia Endothoracica and attaches to the vertebrae (point of articulation). Here we have a clear viscerosomatic relationship.

The fascia continues on:

- fascia M. Iliaca en M. Psoas;
- fascia M. Quadratus Lumborum;
- fascia M. Piriformis;
- fascia M. Obturatorius.

Here we see a clear relationship of the kidney with low back pain and radicular pains.

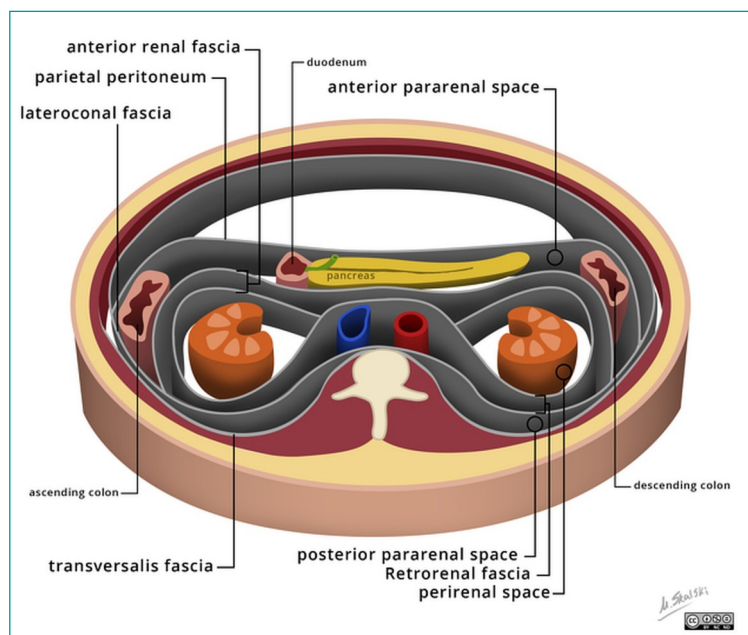
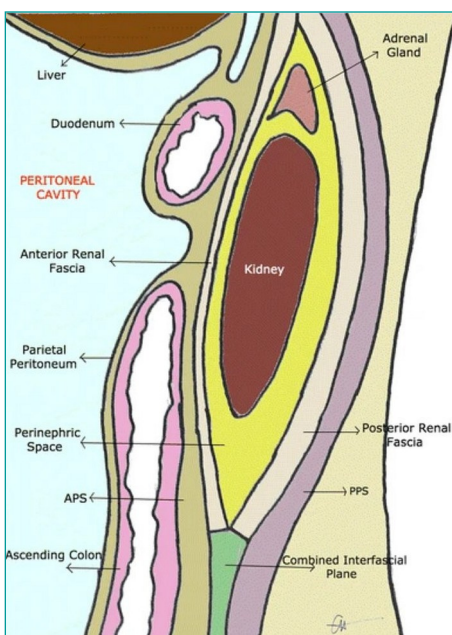
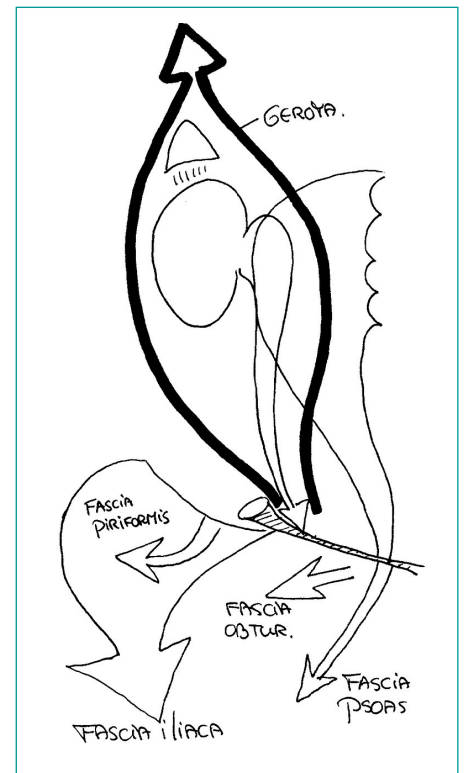
3. Anterior the fascia of Gerota has a connection:

- left with the A. Mesenterica Inferior.
- right is has a limb to the Mesocolon Transversum and lig. Hepato-renal.

4. Lateral of the renal fascia we find the recessus Parieto-colicus.

5. Medial we distinguish three levels:

- at the level of T₁₂ - L₁.
- at the level of L₃.
 - ◊ right a relation with Duodenum-III.
 - ◊ left a relation with corpus Pancreas.
- at the level of L₄ a relation with the M. Psoas.



5. Fat-mass kidneys

Outside the pararenal renal fascia is the perirenal corpus adiposum.

- function:
- sliding function (yellow fat).
 - small protection (shock absorption).

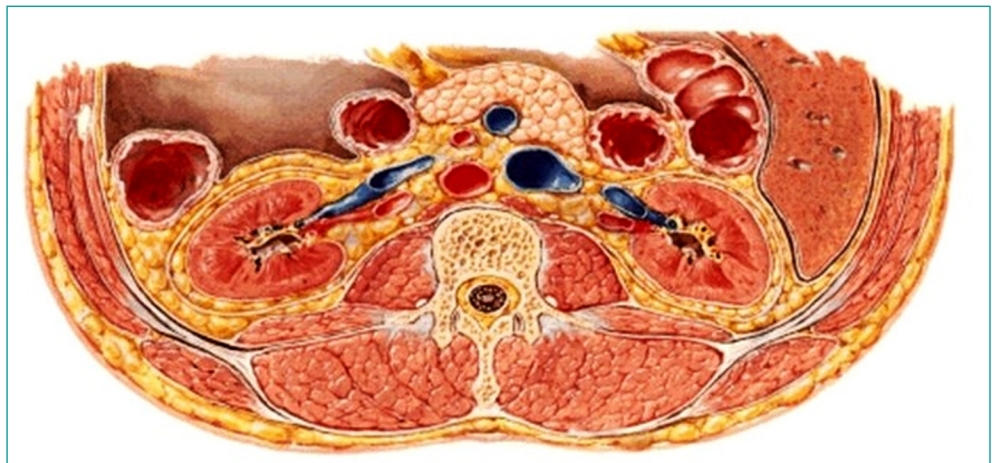
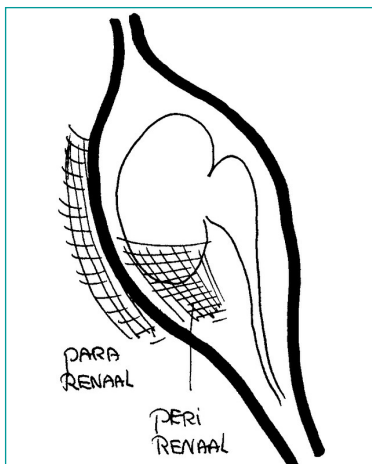
Within the pararenal fascia lies the so-called support fat, which is different in composition and also different in color: brown fat.

- function:
- thermal (insulation).
 - food exchange (example iodine and vitamins).
 - mechanical fixation.

This can disappear as a result of emaciation, compression (kidney enlargement), consequences:

- floating kidney (nephroptosis: chronic low back pain).
- traction on the fasciae → irritation → inflammation → fixation and fibrosis.

The pararenal (gliding function) fat is different in composition than the perirenal fat (support function). The support-fat consists of the so-called brown fat, while the normal fat is yellow in colour.



Intermezzo fat:

Brown fat is tissue that differs from ordinary (yellow) white fat because it is very cell-rich. The cells are also equipped with numerous microscopic mitochondria. Mitochondria are mainly located in the muscles, where energy is converted into muscle power. In brown fat, however, energy is turned into heat. It is basically a central heating system that can be turned on and off. Exposure to cold turns on the heater, but so does overfeeding. Useless calories (sugars and fatty acids) are burned and maintain body weight, while proteins, amino acids and vitamins are not lost. The hypothesis is that in cachexia (rapid emaciation) there is something wrong with the stove, the brown fat. But so far, little research has been done on this. That was because there was no simple technique to determine whether someone has brown fat or not.

White fat, also called yellow fat because of the carotene that is present in it and gives it its specific colour. The white fat is the most spread in the body. It is mainly this type of fat that is important in relation to obesity and cellulite. In contrast to certain mammals, brown fat is present in significantly smaller quantities in humans. It has, as its name implies, a brownish appearance.

This fat plays a role in the regulation of body temperature. The hibernating mammals have significant amounts of brown adipose tissue at the onset of winter. At the end of their hibernation, the brown fat has largely disappeared. In humans, especially babies, the brown fat is mainly located around the spine and partly in the cheeks. In adults, a small amount is still present in the cheeks.

6. Rhythmic information kidney

- Peritoneum Parietal Posterior: visceral Rhythms.
- Fascia Iliopsoica mechanical information (Example: walking, cycling).
- Fascia Endothrocica breathing (SRM).
- Arteries Heart rate (HR).
- Intra-renal flow & filtration tubules, collection tube, renal pelvis. (physics).

7. Ureter

Located in the perirenal fascia anterior: Fascia Psoas.

Critical point: when the Ureter-gaine leaves the Psoas (then only Fascia Iliaca).

Anatomic relation with:

- N. Genito-femoralis.
- A. Testicularis / Ovarica.

Three physiological narrowing's:

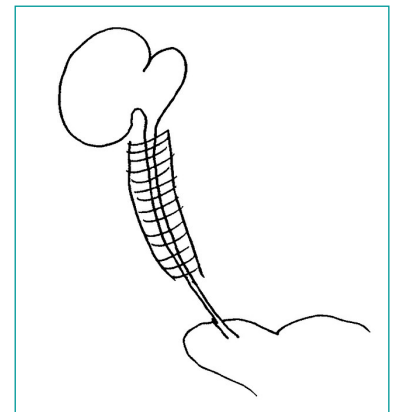
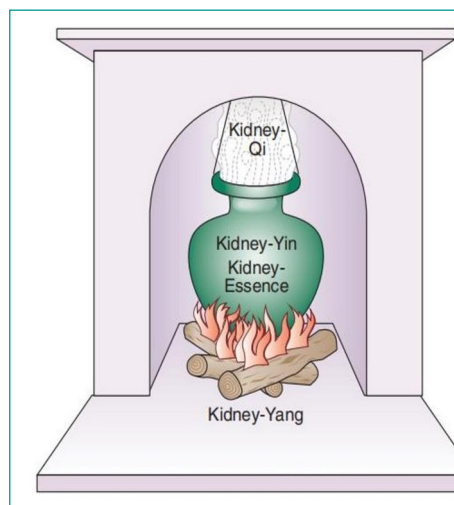
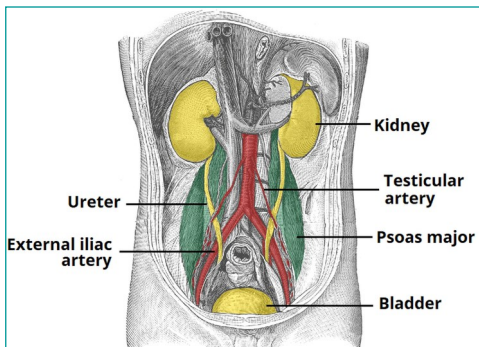
- at the exit of the renal pelvis.
- at the crossing of the Iliac blood vessels.
- outlet in the vesico Urinaria.

History TCM:

TCM (Traditional Chinese Medicine) 'places' the centre of energy in the kidneys. This has been incorrectly translated as a power station (Kidney-Qi) or battery of man. In fact, this means: when the kidneys function optimally in their functions, the aforementioned Equilibrium-Dynamica, there is always sufficient energy that can flow freely and the conditions for actual functioning are optimal.

In other words, when the kidneys respond optimally to the body's demands in their functions, there is sufficient energy for muscle work, digestion, thinking, etc. In other words, there is enough energy available.

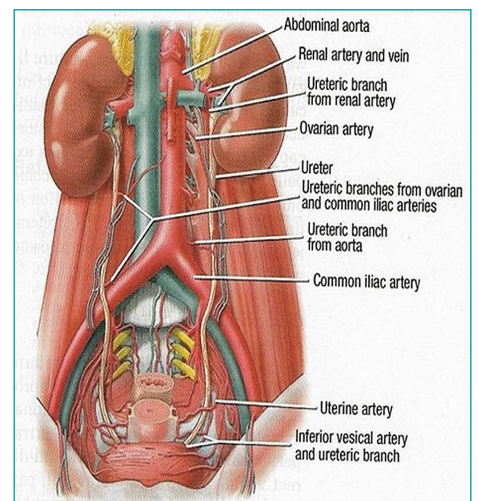
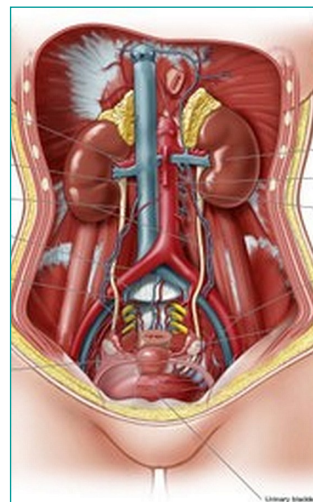
However, there is no question of a power station and certainly not of a battery.



From an osteopathic perspective, the critical point is an anatomical peculiarity and therefore deserves extra attention. It is a meeting of (different fascia of):

- M. Psoas major.
- A. & V. Testicularis (Ovarica).
- Ureter.
- A. & V. Iliaca communis.
- N. Genito-femoralis.

Anterior of it are the Intestines and Ovaria located.



8. 'Fixation' of the kidney

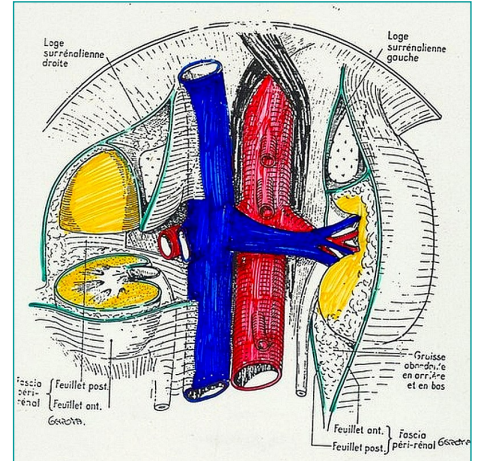
The kidney is 'fixed' in its position by:

1. Ligaments: lig Phreno-surrenalis, lig. Intersurreno-renal.
2. Capsula Adiposa with fibrous bridges.
3. Fascia of Gerota in relation to the arcades of the Diaphragm.
(Quadratus Lumborum, Psoas, Senac).
4. Vascular: arteries and veins.
5. Abdominal and Thoracic pressure.

From an osteopathic perspective, it is better to speak of the fact that the Renal Lodge (nylon stocking) is kept relatively in place by its connections and ligaments.

A fixation of the kidney, in the case of a dysfunction, is rarely. It is more a hindrance to its mobility within the renal fascia.

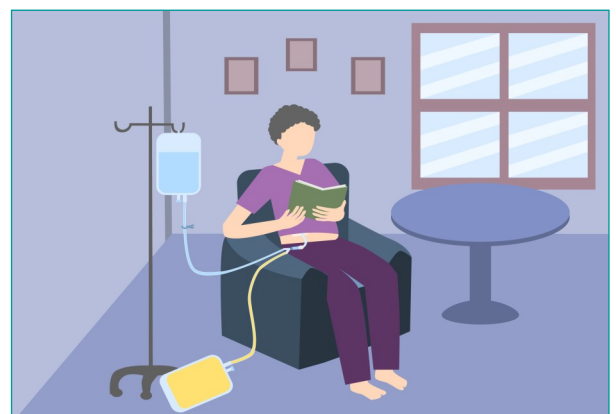
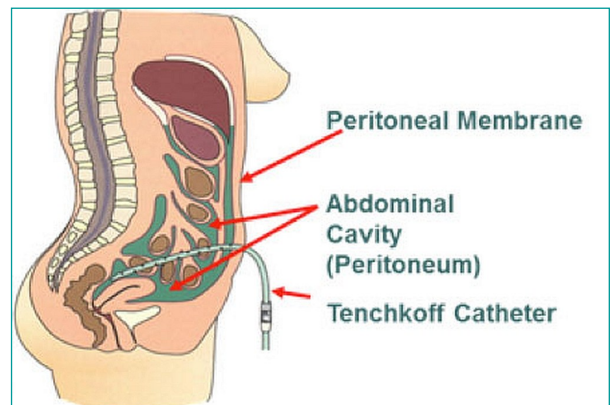
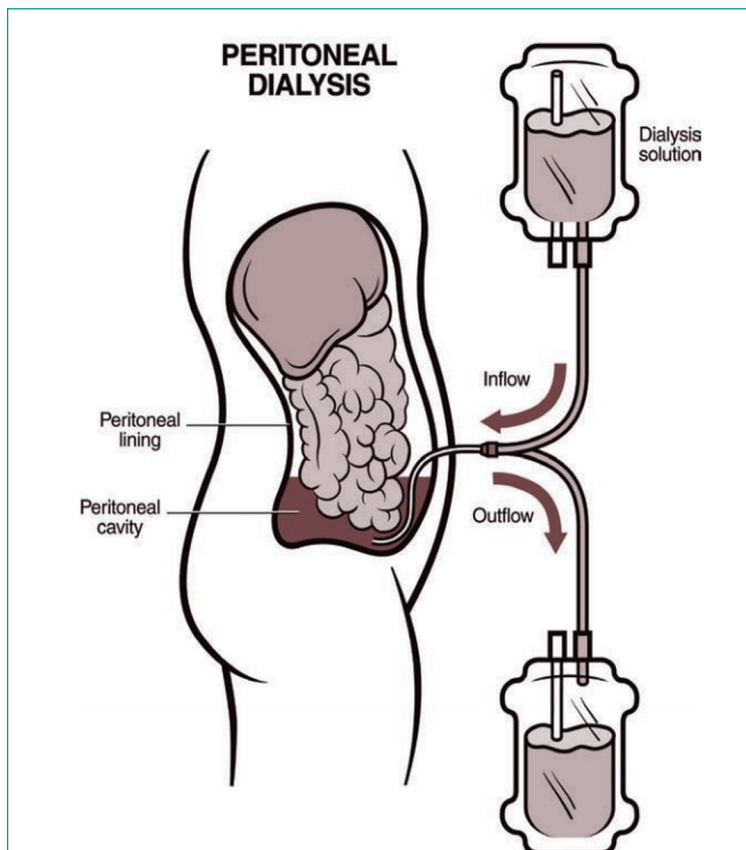
However, the fat in and around the renal lobe can fibrose.



9. Function Peritoneum

The Peritoneum also has a direct relationship between the kidneys or the renal fascia.

- Reduce the degree of friction of the kidneys (sliding function);
- Excretion- and secretion-function;
- neurovegetative immunity information;
- homeostasis (thinking of peritoneal dialysis, see Chapter 13. Peritoneum).



11.11. DIAGNOSTICS REN

11.11.1. Anamnesis & Safety

- Kidney disorders are usually painless in itself, but sometimes headaches, Low Back Pain and visual disturbances occur;
- Oedema: diffuse swelling of the face, eyelids;
- Hypertension can be the result from acute or chronic kidney disease;
- Kidney stones: pain in the ureter, colic, radiating to the lumbar region, groin, sometimes thigh;
- Haematuria due to tumor, stone, inflammation;
- Cloudy urine usually due to inflammation (sometimes phosphaturia).

From an osteopathic perspective , we use the anamnesis to detect abnormalities and identify red flags (exclusion diagnostics), not actually to treat.

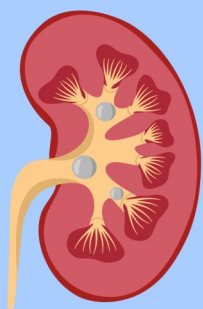
Neither a history nor a regular diagnosis are grounds for a therapeutic choice. This is only determined by osteopathic examination.

Subsequently, the patient often indicates parietal complaints, while causally the kidney is at the root of this. This does not mean that we do not treat the parietal complaints, on the contrary: we treat both the 'causes' and the victims of this.



Patients often report Low Back Pain (LBP) which may be caused by the (mobility of) the kidneys.

SYMPTOMS OF KIDNEY STONE



STOMACH PAIN



BACKACHE



VOMITING



DIZZINESS



FEVER



BLOOD IN THE URINE

