



Disorders of the Kidneys, Bladder and Urinary Organs



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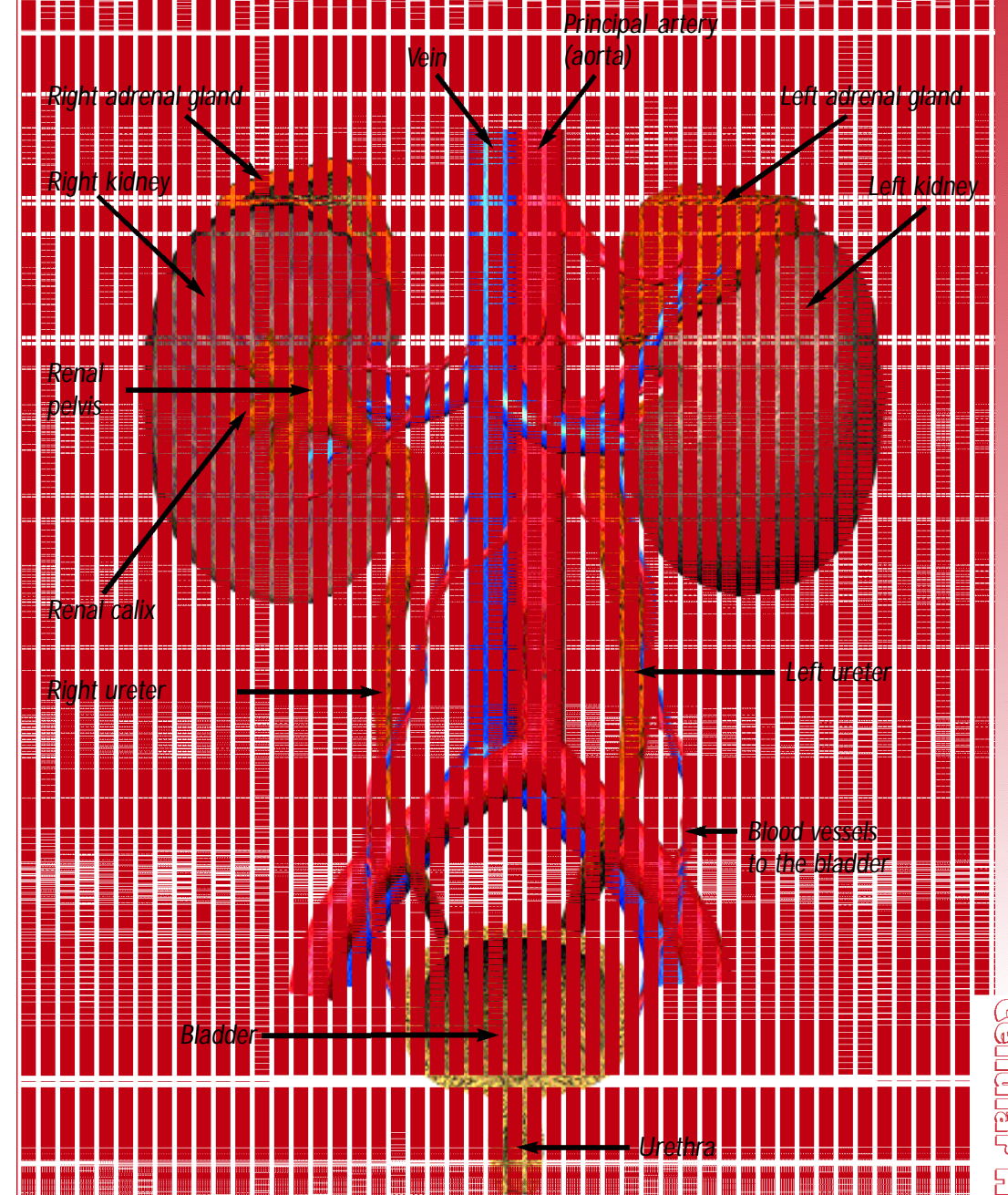
Primary complaints in kidney and bladder diseases

- Too little urinary output (oliguria and anuria)
- Urinary output of more than 3 L (polyuria)
- Frequent urge to urinate (pollakiuria)
- Increased nighttime urination (nocturia)
- Difficulty in urination (dysuria)
- Urinary retention (anuresis)
- Urinary incontinence
- Pain
- Blood in the urine (hematuria)
- White blood cells in the urine (leukocyturia)
- Pus in the urine (pyuria)
- Protein in the urine (proteinuria)
- Bacteria in the urine (bacteriuria)

Disorders of the bladder, kidneys, urinary tract

- Uncomplicated urinary tract infection (cystitis, urethritis)
- Complicated urinary tract infection (acute pyelonephritis)
- Chronic urinary tract infection (pyelonephritis)
- Abscesses in the region of the kidneys
- Acute and chronic inflammation of the renal pelvis (glomerulonephritis)
- Kidney stones
- Acute renal failure
- Chronic renal insufficiency
- Renal tumors

Location of kidneys, bladder, ureters, urethra



Anatomy and Physiology of the Kidneys

The two bean-shaped kidneys lie to the right and left of the spinal column, just below the diaphragm. The blood supply and the discharge of urine take place through the fissure in the center of the kidney, the hilum. Through the hilum, the vessels enter the renal pelvis in which the urine is collected through the renal calices, and is discharged. Further components of the kidneys are the renal medulla and the renal cortex.

Activities of the kidneys

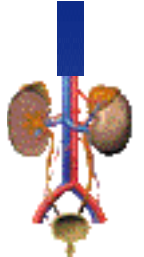
- Excretory organ. They eliminate metabolism end products, the so-called urophanic substances
- Detoxification organ. The body is detoxified of foreign materials, e.g., medications
- Regulation of electrolyte concentration (mineral substances of cellular metabolism)
- Stabilization of water content, osmotic pressure, and acid-base balance
- Hormonogenesis: Renin and erythropoietin. Renin is increasingly excreted with lower blood circulation through the kidneys or low sodium content in the blood. As a result, the blood pressure rises, the sodium concentration in the blood increases, as does blood volume. Erythropoietin is a protein hormone. This hormone is increasingly produced when the oxygen content of the arterial blood is too low, a condition that promotes new formation of red blood cells in the bone marrow. This increases oxygen transport.
- Vitamin D is metabolized.

The vascular system of the kidneys is highly complex

The renal arteries branch into increasingly smaller arteries, their ends a tuft-like capillary loop network (glomerular loops). These loops are found in the interior of the body of the kidneys (glomerulum); there, the blood is filtered and the primary urine collected. A filter membrane that retains red and white blood cells, blood platelets, large molecules (e.g., proteins) in healthy humans is also found there. The highly concentrated secondary urine develops in the tubular apparatus through recovery of water. This is further enriched with products of metabolism before elimination.

Self-regulation of renal perfusion

The filtration rate in the malpighian corpuscles of the kidney in the young adult amounts to approximately 180 L per day. To guarantee this volume of filtration, consistently high renal perfusion and a roughly constant pressure are necessary in the glomerular loops. If the systolic blood pressure is in a range between 80 to 190 mmHg, the kidney itself can regulate this. Kidney failure results when the systolic blood pressure drops below 80 mm Hg. Urine production decreases (oliguria) or ceases (anuria).





Anatomy of the Lower Urinary Tract

The discharging collecting tubes in the kidneys open into

- Renal calices, 8 to 10 each on the left and right
- The renal pelvis absorbs them
- From there, 2 ureters which open into the bladder go out; a valve prevents reflux

Primary complaints in kidney and bladder diseases

Oliguria and Anuria

Definition

Oliguria: amount of urine eliminated 100-500 ml (normal urinary output 1 L -1.5 L)

Anuria: Elimination of less than 100 ml, oliguria usually precedes

Causes

- Cardinal symptoms of acute renal failure
- Obstructive uropathy (e.g., enlarged prostate)
- Dehydration, frequent in the elderly because of too little fluid intake, diarrhea, or vomiting
- With long-term bladder catheterization, possible catheter obstruction or collapse

Important: Anuria is an emergency situation and requires hospitalization

Polyuria

Definition: Urinary output of more than 3 liters

Causes

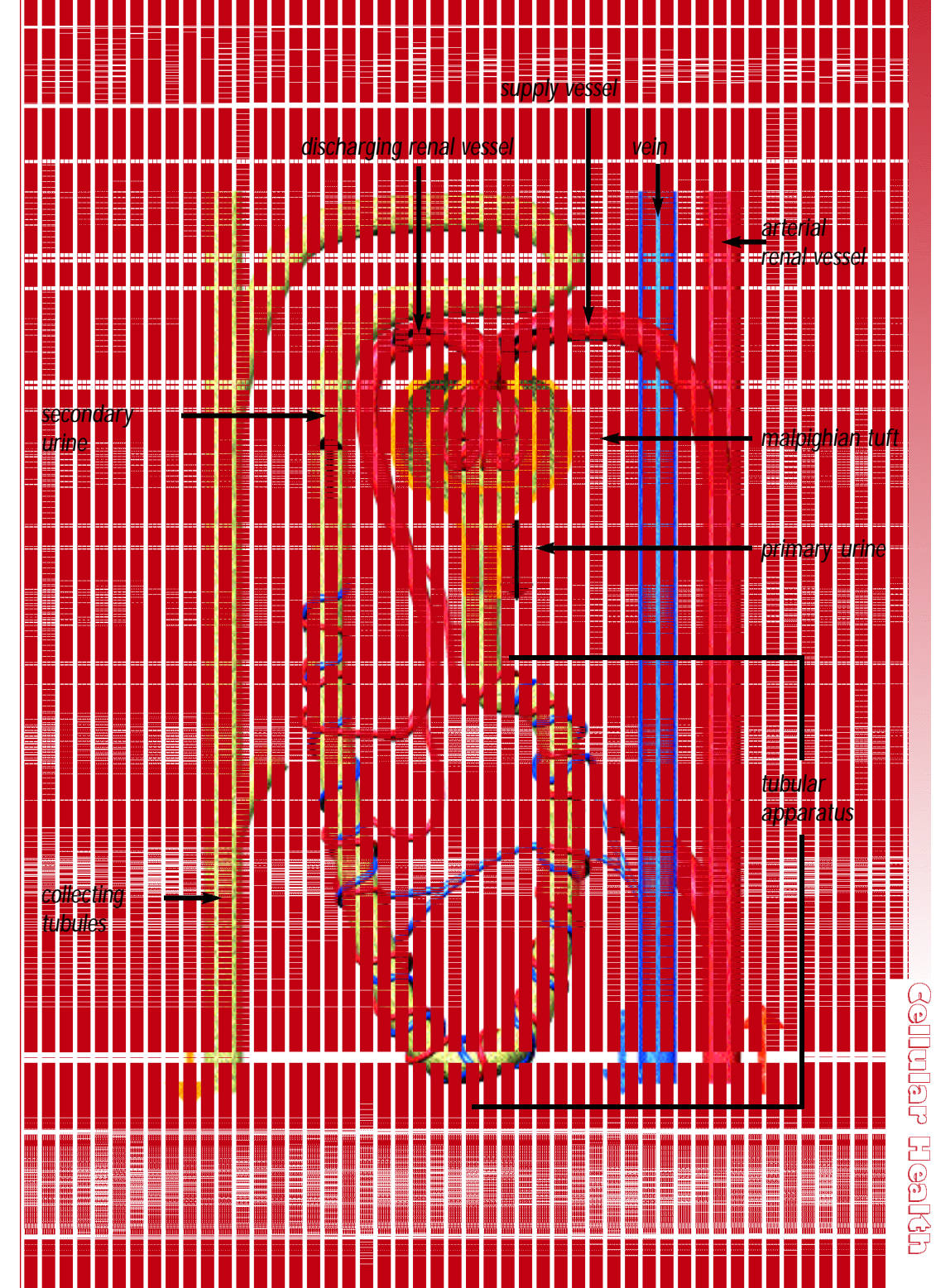
- Most frequent cause: Hyperglycemia (elevated glucose) in Diabetes mellitus
- Specific phases in acute or chronic kidney failure

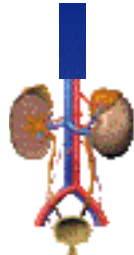
Pollakiuria

Definition

Frequent urge to urinate, low output volume, but normal output volume within 24 hours

Overview of the urine filtration function of the kidney





Causes

- Urinary tract infection or irritable bladder, possibly bladder tumor
- In males, enlargement of the prostate

Nighttime Urination (Nocturia)

Definition: Increased nighttime urination

Causes

- Cardiac insufficiency, kidney diseases
- Large quantities of liquids taken in the evening; use of diuretics

Complications during Urination (Dysuria)

Definition

Difficulty on urination with pain or burning

Causes

- Urinary tract infection
- Tumors in the bladder and/or urethra

Urinary Retention (Anuresis)

Definition

Urination impossible despite full bladder

Causes of mechanical urinary retention

- Enlargement of prostate, obstruction by calculi
- Tumors of the urethra and/or bladder near urethra opening

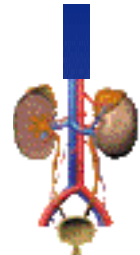
Causes of a neurogenic nature

- Disorders of the nerve supply to the bladder (disk prolapse)
- Stress

Important: Urgent assessment by physician

Enuresis (Urinary Incontinence)

Definition: Involuntary release of urine



Causes

- Urinary tract infection, stress
- Relaxation of bladder and/or pelvic musculature
- Prostate tumor or enlargement

Pain

A distinction is made regarding persistent pain

- Flank pain with renal pelvis inflammation
- Pressure and contact pain with testicular inflammation

Colic

- Cramp-like pain, e.g., with kidney stones
- Radiating pain in the back and genital region

Blood in the Urine (Hematuria)

Definition

Pathological elimination of red blood cells with urine

Causes

- Tumors, calculi, and inflammation of kidneys and bladder
- Increased bleeding tendency, glomerulonephritis (see below)
- Renal tuberculosis, enlarged prostate

Note

- Foods and medicines may also color the urine red
- Requires assessment by physician

White Blood Cells in the Urine (Leukocyturia)

Definition

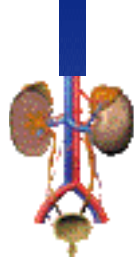
Pathological elimination of red blood cells (leukocytes) in the urine

Cause: Urinary tract infection

Pus in the Urine (Pyuria)

Definition: Pus, cloudiness, and streaks in the urine

Causes: Severe inflammation of the kidneys and urinary tract



Protein in the Urine (Proteinuria)

Definition

Excretion of protein in the urine

Causes of Proteinuria without disease values

- Fever, chills, exertion, prolonged standing, or running

Causes of protein excretions of more than 3 grams per day

- Damage to the malpighian bodies from inflammation, plasmocytoma

Symptoms of severe proteinuria

Edema due to deficiency of protein in the blood

Bacteria in the Urine (Bacteriuria)

Definition

Detection of bacteria in the urine

Causes

Infections in the kidney and bladder regions. Detection is by urinalysis.

Diseases in the Bladder, Kidneys, Urinary Tract

Uncomplicated urinary tract infection (cystitis, urethritis)

Definition

Infection of the lower urinary tract.

Cystitis: Inflammation of the bladder, Urethritis: Inflammation of the urethra

Causes

- Bacteria from the intestine migrate through the urethra into the bladder
- Flow disorders, catheterization
- Sexual intercourse in women, menstruation
- Coldness, wetness, stress, vitamin deficiency

Symptoms

- Frequent urge to urinate, pain or burning upon urination
- Cramp-like pain above the pubic bone
- Foul-smelling urine, cloudy urine, blood in urine

Natural Prevention and Supportive Treatment

- Drink plenty of liquids (3 L per day), mineral water and tea (birch, goldenrod)
- Bed rest, hot water bottle, hot sitz baths, genital hygiene
- Wet-hot packs (pubic region), camomile-hayseed compresses
- Bubbling footbath with Equisetum [horsetail]
- Fresh fruit, juices, and vegetables, food supplements
- Little salt, spices, coffee, alcohol, sugar, white flour
- Avoid meat, asparagus, spinach, citrus fruits, milk (produces acidic urine)

Treatment

- Diagnosis by a doctor

After a Mediterranean or tropical stay, bilharziasis should always also be considered.

Complicated Urinary Tract Infection (Acute Pyelonephritis)

Definition

Kidney and renal pelvis inflammation, usually of bacterial origin, complicated urinary tract infection

Causes

- Bacterial pathogens of a bladder infection move up into the renal pelvis
- Spreading through the circulatory system is rare
- Vitamin and mineral deficiency

Symptoms

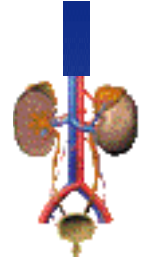
- Fever above 38° C, general condition greatly impaired
- Nausea and vomiting
- Kidney region is painful on percussion, back or flank pain
- Symptoms of a bladder infection

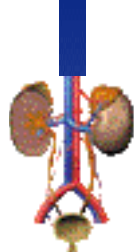
Natural Prevention and Supportive Treatment

- Treatment of the bladder infection
- Go to toilet immediately upon urge to urinate in order to prevent the upward spread of an infection
- Drink plenty of liquids (mineral water), teas (bearberry [Arctostaphylos uva-ursi] with peppermint)
- Bed rest, hot-water bottle, or hot compresses in the kidney region
- Assess fluids to detect threatening acute kidney failure
- Reduced-protein diet
- Support of the immune system
- Food supplements

Treatment

- Diagnosis by a doctor





Chronic Urinary Tract Infection (Pyelonephritis)

Definition

Incompletely healed acute kidney and renal pelvis inflammation

Causes

- Incompletely healed urinary tract infection, urinary flow obstruction due to malformation of the lower urinary tract
- Pain medications: Phenacetin, Paracetamol, antirheumatic drugs
- Too much calcium and too little potassium in the blood
- Diabetes mellitus (blood sugar disorder)
- Gout
- Vitamin deficiency

Symptoms

- Headaches, fatigue, loss of appetite, nausea
- Abnormal paleness, elevated blood pressure
- Lower back pain and lumbar pain
- White blood cells and bacteria in the urine

Prognosis

If the pyelonephritis is incompletely healed, destruction of kidney tissue occurs through increasing scarring, with chronic kidney failure after many years

Natural Prevention and Supportive Treatment

- Nip it in the bud: Completely heal bladder and urinary tract infections
- Drink plenty of fluids, kidney and bladder tea, bearberry tea with peppermint
- Wear warm clothing; avoid cold feet
- Hot compresses in the kidney region, bubbling footbaths
- Reinforcement of the immune system
- Reduced-protein diet
- Vitamin-rich food, food supplements

Treatment: Diagnosis by a doctor

Abscesses in the Region of the Kidneys

Definition: Accumulation of pus in the region of the kidneys

Causes

- Ascending infectious pyelonephritis (see page 127)
- Staphylococcus or Streptococcus infection
- Vitamin and mineral deficiency

Symptoms

- High fever, shaking chills, general condition greatly impaired
- Pain in kidney region

- Inflammation of the pleura due to physical proximity of the organs
- In the case of abscesses located near the kidneys, an important femoral flexor is often irritated. The affected individuals then lie in bed with legs drawn up; urine findings normal
- In the case of a suppurative kidney (pyonephrosis), the abscess is within the kidney and is connected to the renal pelvis. Abnormal urine findings

Treatment

- Diagnosis by a doctor
- Antibiotics, renal fistula to drain pus, possible removal of the diseased kidney if the second kidney is healthy

Natural Prevention and Supportive Treatment

- Avoidance of an ascending infection, complete healing of the precursor illness
- Increase in defensive efforts
- Reduced-protein diet
- Plenty of fruit, vegetables, fresh foods
- Food supplements

Inflammation of the Renal Pelvis (Glomerulonephritis)

Definition

Inflammation of the kidneys not caused by bacteria with overriding damage to the malpighian kidney corpuscles (Glomeruli)

Acute Inflammation of the Renal Pelvis (Acute Glomerulonephritis)

Causes

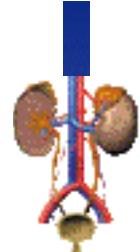
- Misdirected immune reaction 1-4 weeks after an infection (scarlatina or middle ear infection)

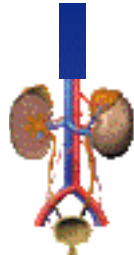
Symptoms

- Strong feeling of illness with fatigue, headaches, fever
- Vague sensation of pain in the kidney region
- Edema, particularly around the eyes
- Little excretion, thus edema
- Blood in the urine, temporary high blood pressure
- Risk of pulmonary edema

Natural Protection and Supportive Treatment

- Restrict intake of table salt, fluid, protein
- Avoid foods containing potassium
- Reinforcement of the immune system
- Food supplements



**Treatment**

- Treatment, complete healing of the initial illness, reinforcement of defenses
- In the acute stage bed rest for 3-4 weeks, consult a physician, possible hospitalization

Chronic Inflammation of the Renal Pelvis (Chronic Glomerulonephritis)

Definition: Disease insidiously progressing from years to decades

Symptoms

- Insidious, with no acute stage
- Development of renal insufficiency, high blood pressure
- Protein and a little blood in the urine
- Symptoms of chronic renal failure

Natural Protection and Supportive Treatment

- Avoid excessive physical exertion
- Do not take Paracetamol
- General: Avoid drugs with harmful effect on renal metabolism in consultation with physician
- Low-protein diet, calorically adequate, table salt restriction
- Drink plenty of fluids, at least 3-4 L daily
- Vitamin-rich food, food supplements
- Support of immune defenses

Treatment: Diagnosis by a doctor

Kidney Stones**Definition**

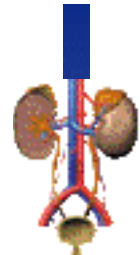
Formation of concretions in the lower urinary tract, frequently with cramp-like pains (colic)

Causes

- Small crystals form when there is an excessive concentration of certain urine components; they become larger, e.g., calcium-containing stones (calcium oxalate or phosphate); uric acid calculi
- Bacterial infection and urinary retention favor the formation of stones

Symptoms

- Nierenkolik: Sehr starke, krampfartige Schmerzen, wellenförmige Wiederkehr, ausstrahlende Schmerzen; bei Steinen im Nierenbecken Schmerzen im Rücken, bei tiefer gelegenen Harnleitersteinen ausstrahlende Schmerzen bis in Hoden oder Schamlippen.
- Difficult urination, blood in the urine (injuries caused by calculi)



- Nausea, vomiting, incipient intestinal obstruction
- Renal pelvic cast stones often cause only slight persistent pain. This is dangerous since constant irritation of the renal mucosa can result in inflammation and permanent damage as serious as shrunken kidney with chronic renal failure.

Natural Prevention and Supportive Treatment

- For pain relief: Hot lumbar compresses, hot water bottle
- Movement to promote stone passage
- Avoid excessive intake of milk, chocolate, and meat
- Drink plenty of fluids, 3-4 L per day, food supplements

Treatment

- Diagnosis by a doctor
- Analysis of stones essential to adjust nutrition, i.e., to avoid certain foods

Acute Renal Failure

Definition: Sudden functional failure of the kidneys in patients with previously healthy kidneys. **Seek immediate medical care or hospitalization.**

Causes

- Perfusion disorders of the kidney in the case of shock or dehydration
- Metabolic coma in diabetes and lactic acidosis
- Severe hypovolemic conditions with a drop in blood pressure, e.g., in the case of massive blood loss, high fluid loss through the kidneys and the gastrointestinal tract or due to burns

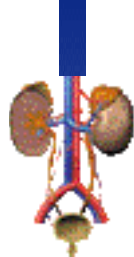
Most frequent cause: Septic shock

- In approximately 20 % of cases, the underlying cause is toxic trauma
 - Eclamptic toxemia, pancreatitis
 - Breakdown, decomposition of red blood cells, chemicals: E605, aniline
 - Medications: Antibiotics, barbiturates, cytostatic agents

Symptoms

Basic symptoms: Oliguria and anuria (see Page 122)

- Table salt and water are not excreted; consequently the following may occur:
 - Pulmonary edema with respiratory distress and rapid breathing
 - Cerebral edema: Anxiety, seizures, loss of consciousness including coma
- potassium in the blood: Life-threatening cardiac arrhythmias
- Symptoms of uremia from urinary toxins that are not excreted:
 - Nausea, vomiting, loss of consciousness
- Skin blisters in unconscious individuals lead to the conclusion of poisoning by barbiturates (sleep medications)

**Nutrition in the Polyuria Stage (= Excessive Urination)**

- Plentiful intake of fluids, to balance fluid loss
- Highly salted diet
- Potassium-rich foods such as dried fruit, nuts, peas and beans, bananas, parsley, chives
- Food supplements

Nutrition in the Oliguria/Anuria Stage (= Little or No Urination)

- Fluid intake to adapt to fluid loss, strict low-potassium diet
- Adequate intake of calories, but little sodium and protein
- Food supplements

Treatment

- **Prompt assessment of cause by a physician, hospitalization in case of emergency**
- Consistent treatment of the causes

Chronic Renal Insufficiency**Definition**

Slowly increasing dysfunction of kidneys, may result in complete loss of function of both kidneys, i.e., uremia

Causes

- Chronic glomerulonephritis (see Page 130)
- Diabetic renal disease (sequela of Diabetes mellitus)
- Analgesic-induced renal injury
- Chronic pyelonephritis (see Page 128), cystic kidneys

Symptoms

- Long symptom-free period, then critical change in performance
- Advanced stage: Accumulation of urophanic substances in the blood, all organs are affected:
 - **Heart, circulatory system:** Hypertension, edema, inflammation of the pericardium
 - **Cardiac arrhythmias** with danger of cardiac arrest
 - **Lungs:** Pulmonary edema, pleurisy, pulmonary inflammation
 - **Gastrointestinal tract:** Halitosis, taste disorders, nausea, vomiting, diarrhea, inflammation of the gastroduodenal mucosa
 - **Central nervous system:** Concentration disorders, headaches, confusion, tendency to seizure, consciousness disorder including uremic coma
 - **Skin:** Pruritus, brownish-yellow skin coloration, urine odor
 - **Blood:** Anemia, since the erythropoietin hormone is inadequately produced, bleeding tendency
 - **Bones:** Renal osteopathy: The kidney cannot convert the vitamin D from food into the form suitable for the body. Too little calcium is absorbed in the intestine; the blood calcium level drops. Because of this, the epitheli-

al bodies increase production of the parathyroid hormone. This results in increased bone remodeling and deterioration

Natural Protection and Supportive Treatment

- Vitamin-rich diet
- Food supplements
- Follow diet depending on the underlying illness
- Diet low in protein, calcium, and phosphate

Treatment

- Diagnosis by a doctor
- Treatment of the underlying illnesses, therapy of diabetes mellitus
- Avoidance of pain medications, switching to other processes, e.g., acupuncture, relaxation techniques, heat or cold applications

Renal tumors**Definition**

Approximately 90 % of renal tumors are malignant. In adults, renal cell carcinoma is the most frequent; in children, Wilms' tumor. Renal cell tumor involves malignant degeneration of the tubular cells of the renal cortex.

Causes

- The following are discussed:
 - cicatricial changes, abuse of pain medications, smoking
- Vitamin deficiency

Symptoms

- No early symptoms
- Later: Relatively small or relatively large amounts of blood in the urine, pain in the kidney region or the flank region
- Associated symptoms: High blood pressure, excess calcium in the blood, liver function disorders, back pain, possible spontaneous fractures
- Renal colic, when blood clots obstruct the ureter after tumor bleeding
- Weight loss, night sweats, possible episodes of fever

Natural Protection and Supportive Treatment

- Healthy nutrition, whole foods with fruits and vegetables
- Support of connective tissue stability
- Food supplements

Treatment: Diagnosis by a doctor

