

Natural Carlsbad Thermal Salt

Sal Carolinum

For Prevention and Treatment of Diseases

Information Manual

VŘÍDELNÍ SÚL spol. s r.o.

Karlovy Vary
(Carlsbad)

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Dear readers,

This brief manual includes important information and explanation of beneficial healing effects of Carlsbad thermal salt on the human body for all people who are interested in their health. It also includes recommendations for the correct dosage for both preventive and curative purposes. We would be grateful for any remarks, comments and suggestions. Please call us at our company's phone number +420 353 549 285.

Brief History of Carlsbad Health Spa

The emergence and development of the famous Czech spa town of Karlovy Vary or Carlsbad has always been inextricably linked with the beneficial effect of hot mineral water on the human body. Their centuries-old successful use in the treatment of many diseases affected the overall atmosphere and ambiance of the city and left indelible traces in its history, architecture, and economy. Mineral hot springs fascinated people and awoke their phantasy since the Middle Ages. A famous legend has it that they were discovered in the first half of the 14th Century by the Czech King and Holy Roman Emperor Charles IV during a deer hunt. Founding of the spa town at the confluence of the Ohře and Teplá Rivers by Charles IV was not as accidental as the legend says, but quite inevitable. Medical properties of the mineral water must have been known and used sporadically long before that time. However, only a city could facilitate their full and expert use for prevention and treatment of a much wider range of diseases.

The exact date of the town founding is not known. The emergence of a permanent settlement has been estimated to be around the year 1350. However, archaeological discoveries place the first signs of human habitation on the territory of modern Carlsbad as early as the Bronze Age, which is also confirmed by further excavations in Drahotice. The first written document of a "Hot Spring Town" refers to August 14, 1370 when Charles IV promoted the village to a town and at the same time, gave it and the nearby town of Loket privileges and rights pertaining to a royal town. During the reign of King Wenceslas IV, Carlsbad also received the in those days in Bohemia rare asylum privilege. Privileges and rights of the royal town of Carlsbad have been later repeatedly confirmed by many Czech rulers.

Between the Middle Ages and the end of the 16th Century, Carlsbad spa treatment consisted mainly of bath therapies. Drinking therapy with mineral water from the "Vřídlo", meaning Geyser, began to be used thanks to the initiative of Doctor Václav Payer, who published the first book on Carlsbad treatment in 1522. He recommended using the healing water internally instead of bath. After 1600, his followers in Carlsbad included doctors Michael Reudenius and Johann Stephan Strobelberger who also favoured drinking procedures over bath. Some extreme recommendations even included drinking 50 to 70 cups of water a day. Doctor Reudenius recorded his findings about drinking therapy of a known Czech noblewoman Polyxena Lobkowitz, which later became the source of the first-ever text about the effects of thermal water on human body. Today text is stored in the Library of the University of Vienna.

In the late 16th Century, several natural disasters halted the development of the spa town. The first happened on May 9, 1582, when the town was affected by flooding. The second disaster was an extensive fire on August 13, 1604, which burned down 99 of the town's 102 houses. The town experienced repeated looting, devastation, fires, and subsequent epidemics of infectious diseases and hunger during the Thirty Years War, although Carlsbad was a privileged spa town.

The revival of Carlsbad as a spa town was not until the end of the 17th Century, when its regular guests were wealthy Saxons and later Russian and Polish nobles. In the 18th century, Carlsbad experienced its greatest prosperity. In 1707, Emperor Joseph I confirmed all the previous privileges and status of Carlsbad as a free royal town. As early as the first half of the 18th Century, this spa town was discovered by the members of the Habsburg royal family. In 1711 and 1712, a great event, which extended the fame of Carlsbad, was the visit of the Russian Emperor Peter the Great. Visits of the Empress Maria Theresa increased the loyalty of the burghers to the Austrian royal court, which ultimately sparked both the development of urban construction and improvement of its management. In 1719, the Town Council issued special city laws, which governed all the details of life in the spa. In 1739, the new city rules, the so-called *Instructio politica*, ensured extensive construction of new houses, hotels, and spa buildings.

Doctor David Becher (1725-1792) significantly contributed to the development of spa treatments of the time. Besides his participation in the development and construction of the town bathhouses, he also wrote and scientifically justified various treatment methods, application of drinking therapies, and bath procedures. He also recommended walks in the surrounding forests as

an integral part of the comprehensive treatment. He emphasized that people should drink mineral water at its source. According to his proposals, Carlsbad thermal salt began to be produced and exported in 1764. He also proposed the recipe for now world-famous *Becherovka*, whose production began in 1807 by pharmacist Josef Vitus Becher. Some 34 years later, his son Jan Becher began to produce this medicinal herbal liquor in bulk. In the first half of the 19th Century, treatment methods and other ideas of David Becher were further developed by the excellent spa doctors. They included Jean de Carro (1770-1857), Rudolf Manley (1812-1863), and Eduard Hlaváček (1808-1879), who significantly contributed to the glory of the city of Carlsbad and the Carlsbad spa. An important moment in the history of the town was the year 1844, when, thanks to the chemist Adolf Martin Pleischel and physician Eduard Hlaváček, exports of mineral water substantially increased.

Since the end of the 18th Century the ranks of visitors to the spa have been swelling. Along with wealthy people and nobility, a number of prominent personalities visited Carlsbad. They included Johann Wolfgang Goethe, Friedrich Schiller, Theodor Körner, Ludwig van Beethoven, Jan Evangelista Purkyně, Fryderyk Chopin, Niccolò Paganini, Antonín Dvořák, Emil Holub, Ema Destinová, Thomaš Garrigue Masaryk, Yuri Alexeyevitch Gagarin, Václav Havel, and many others.

The end of 19th and beginning of the 20th Centuries are called the Golden Age of Carlsbad. Growth of clientele has contributed not only to the development of urban infrastructure and rail networks, but also facilitated new research, which brought additional knowledge and advances in the treatment of serious non-communicable diseases. Great attention was paid mainly to treatment of diabetes and obesity. This successful period was briefly interrupted by a flood on November 24, 1890 that damaged the downtown area. The badly needed modernization of spa facilities that followed, however, led to new developments of medical treatments in Carlsbad. Significant theoretical studies and conclusions of their practical experience were published by local doctors including Leopold Fleckles, Paul Cartellieri, Edgar Gans, Emerich Hertzka, and Victor Nicolaus Kronser.

After 1948, the Carlsbad spas were centralized and nationalized. Comprehensive spa treatments that also included foreign knowledge and experience began to be strongly pursued. Currently, the balneology in Carlsbad is achieving excellent results with worldwide acceptance. The Balneological Research Institute, founded in 1952, contributed in no small measure to this success. It has served as the national research institute for the fields of physiotherapy and rehabilitation until 1992.

In 2013, Institute of Balneology Karlovy Vary was established in Carlsbad. It focuses on basic and applied research in balneo-medicine and the use of scientific knowledge in the spa medical practice.

Until about the mid-16th Century, the treatments prescribed mainly baths, which were quite demanding for patients because they lasted more than ten hours per day. Around 1521, Václav Payer began the use of mineral water internally as a drinking therapy, but it spread some one hundred years later. After 1600, Johann Stephan Strobelberger tirelessly campaigned for its use in his medical treatises. This preference has brought with it some health negatives because patients drank, as reported, between 50 and 70 cups of mineral water daily. It was David Becher, who introduced balanced and moderate drinking therapies that did not burden patients and are, with small variations, prescribed to this day.

Manufacturing History of Sal Carolinum - Carlsbad Thermal Salt

The first attempts to produce thermal salt from the mineral spring water in Carlsbad were made as early as 1620. In 1708, physician Gottfried Berger from Carlsbad began to promote the idea that therapeutic salt obtained from thermal waters could be sold outside the city. But it was only in 1732 that the Carlsbad dyer Bernhard Richter began to realize the idea. However, six years later, due to a concern that the export and sale of thermal salt, would cause the number of visitors and patients to decrease, its production and export were banned. More than thirty years later, in 1769, the salt production resumed. The procedure by David Becher obtained the salt by evaporation of thermal

water on copper pans. In 1776, David Becher introduced an evaporative technology, which rested on repeated crystallization of salt and its re-dissolution. In 1878, this technology was upgraded again. From 1882 onward, according to proposal by Ernst Ludwig, in addition to the original crystal salt, powdered salt with better healing properties was also produced.

Between 1922 and 1926, the total amount of annual sales reached about 20,000 kg and between 1927 and 1935, it rose to between 60,000 and 70,000 kg per year. From 1945 to 1970 the export increased more than twelvefold. Still, it was not enough to meet demand and therefore, in the early 1970s, a new salt works was put into operation, which delivered 250 tons of Carlsbad thermal salt annually.

Since 1996, the company VŘÍDELNÍ SŮL spol. s r.o. (THERMAL SALT in English) specializes in the production and sale of Carlsbad thermal salt. The company is the largest supplier to markets in the Czech Republic, the Russian Federation, and other European countries. In 2006, VŘÍDELNÍ SŮL began the production and sale of Carlsbad thermal bath salt with different flavours. The composition of these salts approaches to a maximum degree the basic elemental composition of the Carlsbad mineral water. Thermal salt is produced using the latest technology and strict sanitary controls. The consumers receive a product that contains the same active ingredients as the world-famous Carlsbad mineral-spring spas. It allows them to undergo drinking therapy and baths, including proctological, gynaecological, and dental irrigation in the comfort of their homes.

Characteristics of Carlsbad Thermal Salt

As mentioned above, the natural hot-spring salt has been produced from the Carlsbad mineral water springs since the late 19th Century. The mineral water tastes slightly salty, similar to soda, a bit like chicken broth. Freshly sampled water is clear and colourless. The Carlsbad mineral waters are among the hot, slightly hypotonic, highly mineralized mineral waters, with pH between 6.9 and 7.4. Chemically, the mineral waters are bicarbonate-sulphate-sodium-chloride mineral waters, since their major ions include sulphates (SO_4^{2-}), bicarbonates (HCO_3^-), chlorides (Cl^-), sodium (Na^+) and potassium (K^+). For 1,000 mL there is about 6 g of sodium chloride (NaCl). The Carlsbad thermal salt contains up to 40 different elements including rare earths. Among them, the therapeutically relevant, according to their quantitative representation include sodium (Na), sulphur (S), carbon (C), chlorine (Cl), potassium (K), magnesium (Mg), silicon (Si), fluorine (F), bromine (Br), calcium (Ca), iron (Fe) and other elements (Table 1).

Table 1: Amounts of ions and elements in 100 g of Carlsbad thermal salt.

Ions	Amount	Note
Sulphates	32.9 %	
Bicarbonates	12.8 %	
Chlorides	11.6 g	
Fluorides	0.057 g	
Bromides	0.037 g	
Elements		
Sodium	36.3 g	
Potassium	2.46 g	123 % RDD*
Magnesium	0.103 g	27 % RDD*
Silicon	0.096 g	
Calcium	0.0227 g	
Iron	0.00018 g	

*RDD – Recommended Daily Dose

Other present elements include beryllium (Be), copper (Cu), lithium (Li), manganese (Mn), nickel (Ni), Rubidium (Rb), selenium (Se), strontium (Sr), and zinc (Zn).

General Physiological Effects of Carlsbad Thermal Salt

Mineral water obtained by dissolving Carlsbad thermal salt is a natural ionic solution that perfectly complements the necessary minerals and trace elements in the body that are not normally included in the diet. Carlsbad thermal salt dissolves in drinking water at the recommended concentrations. Water so produced retains the character of low to medium mineralized mineral water with an optimum ratio of main components, such as hydrocarbons, sulphates, and chlorides. It has the same therapeutic effects as Carlsbad mineral spring water.

Drinking mineral water prepared from Carlsbad thermal salt does not burden the organism. Drinking therapy acts as diuretic and leads to a slight alkalization of urine, which is important for the prevention of urinary stones or urolithiasis. Repeated water intake regulates the concentration of minerals in blood and tissues, improves digestion, enhances absorption of nutrients, and synchronizes the function of endocrine organs. It suppresses inflammatory processes and increases immunity.

Irrigations and baths in mineral water prepared by dissolving Carlsbad thermal salt have calming and pain-relieving effects. They also reduce the inflammation process and support treatments of many infectious and non-infectious, degenerative, and metabolic diseases.

Treatment Phases and Accompanying Symptoms of Drinking Therapy

Spa treatment, accompanied by regular consumption of mineral water, is always subject to certain principles. The course of treatment and drinking therapy can be divided into three basic stages. According to the state of patient's health, age, and the nature of the illness, they may have different duration. They may be accompanied by the characteristic symptoms, which may in turn have more or less intense manifestations.

Adaptation Phase

It is sometimes referred to as a *spa reaction*. It lasts an average of 8 to 12 days. Its typical symptoms include increased fatigue, lack of appetite, and feeling of bitterness in the mouth. It may also include darker stool or vomit with bile, and sometimes worsening of the disease. **Note:** The adaptation response occurs not only in drinking Carlsbad mineral water, but it is typical for other mineral water in spas elsewhere.

Improvement Phase

During this phase, the symptoms mentioned above disappear. Its duration varies. In majority of patients the symptoms subside within one or two days, but in others after three or four weeks.

Stabilization Phase

Patient's health condition normalizes and further improves, and according to the severity of the disease may persist for one or more years. Length of spa treatment in compliance with regular drinking therapy should therefore take at least three weeks. After that, practically all patients experience a definite health improvement and stable health condition.

Specific and Nonspecific Effects of Carlsbad Thermal Salt on Human Body

Drinking mineral water has three specific effects on the **body**, namely mechanical, thermal, and chemical. It affects the organism in a nonspecific way, as well.

Mechanical Effects of Drinking Mineral Water

They rest on a total cleansing of mucous membranes of the gastrointestinal tract. In the mouth, they stimulate saliva production, slightly expand the stomach and intestinal lumen, and promote intestinal peristalsis. Mineral water dilutes the digestive juices, thereby reduces the content of gastrointestinal hormones of the gastrin and secretin groups. Decrease in their concentration is detected by specific receptors and an increase in both the formation and release of these hormones into the lumen of the stomach and intestines takes place. At the same time, the formation of hydrochloric acid in the stomach and secretion of pancreatic juice and bile is encouraged. Free CO₂ in mineral water expands the vasculature and accelerates the resorptive processes for other ions contained in mineral water.

Thermal Effects of Drinking Mineral Water

They induce increased blood supply (hyperaemia) of mucous membranes, soothe the increased gastric motility and intestinal peristaltics, and increase the absorption of minerals. Warm water reduces the secretion of gastric juice, thus slowing down the transfer speed of water from stomach into duodenum. It releases the tone of intestinal muscles, which explains the anticonvulsant activity, as it acts spasmolytically. This effect is used to support the treatment of inflammatory bowel diseases. In order to reduce diarrhoea, one has to drink mineral water of a higher temperature of about 72°C, while against constipation one needs lukewarm water of about 30°C. To maintain normal stool, we advise to drink water around 50°C.

Chemical Effects of Drinking Mineral Water

Elements contained in mineral water influence many life processes at the level of the whole body, organs, and individual cells. Of the 92 chemical elements occurring in nature, the human body contains 81, of which 12 elements are referred to as structural, since they make up 99 per cent of the human body composition. Important are the so-called trace elements which are present in the body in very small quantities, but they are essential or indispensable for a variety of life processes. Many of these structural and essential trace elements are included in both the Carlsbad mineral water and the thermal salt, prepared from them (Table 1).

The therapeutic drinking adjusts the balance of the water and mineral management of the body, which facilitates physiologically standardized operation of the whole metabolism of the organism and functions of individual organs. Ions and trace elements are selectively moved through the lining of the digestive tract into the internal environment of the organism. They affect not only the metabolism of proteins, fats and carbohydrates, but together with the non-specific effects of drinking regimen (see below), they act on the endocrine glands (hormonal secretion), and the CNS (secretion of neurotransmitters) which regulate the blood flow, secretion and excretion, and the coordination and muscle activity.

The therapeutic drinking cure delivers minerals and trace elements to the body, where they are absent or insufficient in patients for various reasons. Their deficiency can be caused by nutritional factors, such as monotonous or highly specialized diet, or due to compromised metabolism accompanying various diseases.

Nonspecific Effects on Human Body

Nonspecific effect rests on the time compliance with repeated drinking of Carlsbad water throughout the day. The regularity of the drinking regimen acts on the central and peripheral nervous system and the endocrine glands, which normalize the functional manifestations of organ

systems as well as individual organs. It positively affects the composition of intestinal microorganisms and their activity, which increases the utilization of nutrients from food. It directly affects the immunological processes in the largest immune organ in the body that is in the lymphoid tissue closely tied to the digestive tract, in the so-called GALT or Gut Associated Lymphoid Tissue. This explains why in treated patients, an improved adaptation of the organism to environmental stress factors takes place. Ultimately, it increases the readiness of the immune system to respond to infectious agents.

Effects and Body Reactions to Carlsbad Thermal Salt

Chemical Effects of Individual Ions

Bicarbonate ions (HCO_3^-) affect gastric secretion. If we drink mineral water on empty stomach, then the HCO_3^- ions do not react with hydrochloric acid in the stomach and pass into the intestines, where they alkalize the intestinal content, which reflexively reduces gastric secretion. If we drink shortly before or during a meal, then stimulation of gastric secretion occurs. In normal and increased production of hydrochloric acid, the HCO_3^- ions inhibit the activity of certain enzymes, which reduces the acid secretion. They also inhibit the formation of gastric mucus, reducing its viscosity and through the nervous system stimulate receptors of acidifying, secretory, and motor functions of the stomach. They have the same effect on the formation, secretion, and properties of mucus in the respiratory system. Neutralization of stomach contents is accompanied by a reflex increase in secretions of the small intestine, pancreas, and liver.

Total body alkalisation induced mainly via HCO_3^- ions leads to increased insulin sensitivity, sugar utilization, and increased glycogen storage in the liver. The HCO_3^- ions also inhibit the formation of uric acid. They accelerate its excretion into urine and removal from the body. This prevents the deposition of its crystals in joints and other tissues and alleviates painful arthritic symptoms such as gout. The HCO_3^- ions also stimulate the motility of the digestive tract. They normalize the peristalsis of a hypertonic stomach and duodenum.

Chloride ions (Cl) are needed for the production of hydrochloric acid in the stomach. They stimulate the production of digestive juices and positively affect liver and kidney functions. Together with Ca^{2+} ions, they promote the growth of bones and teeth.

Sulphate ions (SO_4^{2-}) reduce the secretion of gastric juices and accelerate emptying of stomach. They increase intestinal peristalsis and have a mild laxative effect in relieving constipation. Furthermore, they positively affect lipid metabolism, stimulate muscle tone of gallbladder, release bile duct and thus facilitate drainage of bile from the liver into the duodenum. Along with the Cl ions, they increase the bile production in the liver and simultaneously the subsequent emptying of the gallbladder (cholecystokinetic effect). They also increase the pancreatic secretion, which is used for the treatment of peptic dysfunction syndromes. The combination of SO_4^{2-} and Ca^{2+} ions enhances the function of liver enzymes, prevents loss of water in the digestive and urinary tracts during inflammation, and regulates the production of mucus in inflamed intestines and urethra. The activity of intestinal bacteria converts the SO_4^{2-} ions into hydrogen sulphide. The SO_4^{2-} ions together with Mg^{2+} and Ca^{2+} also positively affect carbohydrate metabolism.

Sodium ions (Na^+) regulate the water management in the organism and thus the balance of other minerals in the body. They are essential for the transport of nutrients from blood into tissues. The neurotransmission of stimuli and nerve-muscle coordination depends on them. Mineral water drinking therapy compensates for the critical loss of Na^+ caused by excessive sweating, diarrhoea, or due to kidney disease, which can cause serious threat to life.

Calcium ions (Ca^{2+}) reduce the excitability of neurons in the brain and skeletal muscles, improve contractile function of the heart muscle, and increase blood clotting. Along with HCO_3^- ions, they reduce the blood supply to the gastric mucosa and gastric secretion. They have anti-inflammatory, antiallergic, and spasmolytic effects on the mucous membrane of the stomach and intestines. They block intercellular spaces, and thus slow down the inflammatory transudation and exudation.

Because only about 10 per cent of Ca^{2+} is absorbed, there is also a slowing of intestinal secretion and attenuation of intestinal peristalsis. This leads to thickening of the intestinal contents and reduces and alleviates the course of diseases associated with chronic diarrhoea.

Magnesium ions (Mg^{2+}) alkalize internal environment of the organism, which facilitates the anti-inflammatory effects of Ca^{2+} . They also enhance cell sensitivity to insulin as well as optimize cellular metabolism of sucrose and storage of glycogen in the liver.

Chemical Effects of Trace Elements

In addition to the above mentioned structural elements and their basic compounds, the Carlsbad mineral water includes essential and semi-essential trace elements. Essential trace elements are iron (Fe), iodine (I), copper (Cu), zinc (Zn), cobalt (Co), chromium (Cr), molybdenum (Mo), selenium (Se), and manganese (Mn). Conditionally essential trace elements are arsenic (As), boron (B), bromine (Br), fluorine (F), lithium (Li), nickel (Ni), silicon (Si), and vanadium (V).

Trace elements are found in human body in very small amounts of about 0.000001 per cent, but as part of enzymes and other factors, they are responsible for maintenance of fundamental life processes. They regulate more than 50,000 biochemical processes and their inadequate intake always manifests itself as serious illness, such as anaemia or blood disorder due to Fe deficiency.

Indications for Treatment Support

Drinking therapies using mineral water prepared from Carlsbad thermal salt promote and accelerate healing of many non-communicable diseases, oncological, as well as infectious diseases of the gastrointestinal tract, liver, gallbladder, pancreas, kidneys, and urinary tract. They also facilitate healing of circulatory organs, musculoskeletal system, and nontuberculous diseases of the respiratory organs (Table 2). Application of drinking therapies is suitable for normalization of gastric secretory activity (improving the digestion of food), optimization of composition, quality, and distribution of the protective mucus in the digestive system, the reduction of flatulence, improving the quality of bile, and normalization of its excretion from the liver and gallbladder, and stimulation of the secretory function of pancreas.

Carlsbad thermal salt solution is also designed to normalize body weight by reducing the proportion of body fat and for the prevention of premature aging. It is recommended as a support of the treatment of some gynaecological problems, for improvement of metabolic processes in the skin, and ultimately to improve microcirculation and to promote blood supply to gums and tooth sockets in inflammation of the gums (periodontitis).

Table 2 Indications for treatment using drinking therapies.

Diseases of gastrointestinal tract	<ul style="list-style-type: none"> • Ulcers of stomach and duodenum, intestinal diseases, conditions after stomach surgery (resection) • Irritable bowel syndrome, treatment of intestinal peristalsis (chronic constipation, diarrhoea) • Haemorrhoids, abscesses • Treatment of dysbiosis and reduction of flatulence and bloating
Diseases of liver, gallbladder, and biliary tract	<ul style="list-style-type: none"> • Chronic liver inflammation (hepatitis) and cirrhosis (except for a period of disease worsening) • Chronic inflammation and dyskinesia of biliary tract (cholangitis) and chronic inflammation of gallbladder (cholecystitis) • Conditions after gallbladder surgery
Diseases of pancreas	<ul style="list-style-type: none"> • Chronic and recurring inflammation (pancreatitis)
Diseases of kidney and urinary tract	<ul style="list-style-type: none"> • Prevention and treatment of kidney and urinary stones (urolithiasis) and chronic inflammation of the urinary tract (urethritis, cystitis)
Respiratory diseases	<ul style="list-style-type: none"> • Thinning of mucus (mucolytic effect) in acute and chronic bronchopulmonary

	diseases
Musculoskeletal diseases	<ul style="list-style-type: none"> • Arthritis and arthrosis of the joints of the limbs and spine • Degenerative spinal dystrophy
Metabolic disorders	<ul style="list-style-type: none"> • Type 2 diabetes, obesity, gout, disorders of lipid metabolism, normalization of aqueous electrolyte balance in dehydration, acidosis, and hangover • Haematopoiesis (treatment of some type of anaemia)
Oncological diseases	<ul style="list-style-type: none"> • Cancer of stomach, colon, rectum, breast (after complex treatment and without evidence of an active process)
Gynaecological diseases	<ul style="list-style-type: none"> • Inflammation and mycosis
Dental diseases	<ul style="list-style-type: none"> • Periodontitis and other dental and gum diseases
Cosmetology	<ul style="list-style-type: none"> • Improving of skin quality and prevention of its premature aging
Infectious diseases	<ul style="list-style-type: none"> • Secondary infections and inflammations accompanying communicable diseases

Warnings and Contraindications for Drinking Therapy

Carlsbad mineral water made from Carlsbad thermal salt does not replace, but supplements a prescribed dietary or medication treatment. Treatment with drinking therapies and baths are indicated by a physician for individual diseases as they can significantly reduce the medication burden for the body. Because drinking therapy has a slight laxative and diuretic effect, it is necessary to exclude the use of medicinal laxatives. It may slow down the resorption of currently used drugs.

Regarding baths, it should be noted that a long stay in the water is not useful. Bathing should not exceed 20 to 30 minutes. After the bath, it is recommended to shower with warm water. Home drinking therapy depends on the good function of the blood circulatory system and kidneys. People, who respond to table salt with swelling, should not undergo the drinking therapy. Drinking therapy represents certain burden for human body and it is therefore not suitable in certain diseases and conditions. They include infectious, communicable diseases and disease carriers, epilepsy, alcoholism, substance abuse, pregnancy, bleeding and circulatory failure, conditions after deep thrombosis, cancer, as well as urinary and faecal incontinence.

Strictly contraindicated is drinking therapy in all acute diseases and also during organ failure of liver, kidney, heart, and lungs. It is also contraindicated in diagnosed obstacles for patency of the digestive tract, biliary and urinary tracts, all conditions associated with the overall swelling, high blood pressure, and in severe diabetes. Contraindications also apply after the fourth month of pregnancy.

Interaction:

Slow absorption of drugs used concurrently in connection with osmotic reduction of resorption is possible.

Effects of Carlsbad Thermal Salt on Individual Diseases

Internal use of Carlsbad thermal salt accelerates digestion of food in the stomach and its transfer into the small intestine. It stabilizes the composition of gastric juice and intestinal enzymes, and also stimulates the activity of intestinal micro flora. It restores dynamic, secretory and evacuation activities of various parts of the digestive tract during disorders and corrects various types of metabolism of nutrients in the body. Drinking therapies have a positive effect on liver and kidneys, which optimizes the utilization of nutrients and elimination of ballast substances from the body. In contrast, if the drinking therapy is long term, there is a drop in body weight. After treatment with antibiotics and after chemo or radiotherapy, it contributes to faster regeneration of intestinal micro flora.

Digestive tract

Acute and Chronic Gastritis

Gastritis is inflammation of the gastric mucosa, usually caused by the bacteria *Helicobacter pylori* (42 per cent of the population of Czech Republic are infected), which leads to functional disruption of the digestive process, decrease of overall health of the organism, and the reduction of the capacity for work. Table 3 outlines the treatment of various types of gastritis.

Table 3 Application of drinking therapy for gastritis

Disease	Concentration Temperature	Volume of daily doses Daily drinking schedule	Intake method	Treatment schedule Notes
Chronic gastritis with low or almost zero gastric secretion	0.5 % 60°C	Morning: 300 ml on empty stomach Noon: 200 ml Evening: 200-300 ml 20-30 minutes before meals	Slow sipping	Repeat 2-3 times a year
Chronic gastritis with normal gastric secretion	0.5 % 30°C	Morning: 100-400 ml on empty stomach Noon: 200 ml Evening: 100-400 ml 45 min before meals	Slow sipping	Take at least 3-4 weeks Repeat 2-3 times a year
Chronic gastritis with increased gastric secretion	0.5 % or 1 % 45°C or 60°C	Morning: 200-400 ml on empty stomach Noon: 200 ml Evening: 200-400 ml 45-60 min before meals 200 ml before sleep	Quick sips 4 times a day	Take 4-6 weeks Then on empty stomach or before sleep for longer period 100-200 ml

Stomach and Duodenal Ulcers, Conditions after Gastrectomy

Peptic ulcer disease is not usually accompanied by prominent pain (pain increases 2 to 4 hours after meals), but ulcers often bleed and heal poorly. The emergence of gastroduodenal (peptic) ulcers can be induced in the mucosa of the stomach and duodenum through various reasons. They include the aforementioned bacterium *Helicobacter pylori*, or the frequent use of certain drugs (aspirin and nonsteroidal anti-inflammatory drugs such as Ibalgin). A variety of factors may also participate in the occurrence of ulcers. Certain types of food may excessively increase the production of hydrochloric acid or gastric hyperacidity, which is felt as heartburn. They include fats, sweets, chocolate, salt, alcohol, coffee and smoking, spices, onions and garlic, but also prolonged stress and hereditary tendency. Drinking therapy with mineral water removes heartburn and supports the process of healing of mucus after endoscopic removal of ulcers. Table 4 summarizes the applications of Carlsbad mineral water for the treatment of ulcer diseases of the gastrointestinal tract.

Table 4 Application of drinking therapy for ulcerous diseases of the gastrointestinal tract

Disease	Concentration Temperature	Volume of daily doses Daily drinking schedule	Intake method	Treatment schedule Notes
<i>Ulcers of stomach and duodenum during remission or outside of deterioration period</i>	0.5 % 45°C	<i>35-60 min before meals Morning: 400 ml Noon: 200 ml Evening: 400 ml</i>	Small, slow sips 10-15 min between cups	<i>Take 4-6 weeks Then on empty stomach or before sleep for longer time period 100-200 ml</i>
<i>Condition after stomach removal</i>	0.5 % 60°C	<i>Morning: 300 ml on empty stomach Noon: 200 ml Evening: 100-300 ml 20-30 min before meals</i>	Small, slow sips	<i>Take 4-6 weeks Repeat 2 times a year</i>

Chronic Ulcerative Colitis

Ulcerative colitis is a chronic inflammation of the colonic mucosa accompanied by swelling and formation of mucosal ulceration. It always affects the rectum and adjacent part of the colon and in more difficult cases also the whole large intestine (pancolitis). The disease manifests itself mainly between the ages of 30 and 40 and affects by three to ten people per 100 000 inhabitants.

Another idiopathic intestinal inflammation is Crohn's disease, which can occur at earlier age, between 25 and 30 years. However, incidence in childhood and in persons over 60 years of age is no exception. Unlike ulcerative colitis, it may occur in any part of the gastrointestinal tract, from the mouth and oesophagus to the rectum. It occurs in segments, which means that between inflamed regions, there are sections that are completely healthy. The inflammation in this disease occurs across the width of the intestinal mucosa. It may cause narrowing and even intestinal obstruction, adhesions between intestinal loops, abscesses and formation of fistulas between the intestine and other organs in the abdominal cavity. Each year, two to three persons per 100,000 inhabitants fall ill with this disease.

Ulcerative colitis can be induced by several factors including bacterial and viral infections, intestinal parasites, poor diet composition, inadequate medication therapy, and by surgery (after partial removal of the intestine). The causes of Crohn's disease are not known. Its origin may be linked to the consumerist lifestyle, characterized by food technology, conservation and culinary food preparation, excessive consumption of hydrogenated fats, antibiotics and other medications and drugs, smoking, oral contraceptives, and extreme diets. Other aspects are the ever increasing hygienic standards, which apply since early childhood and limit the range of antigenic stimuli needed for full-scale development of the immune system.

Recommendation for Drinking of Mineral Water for Supportive Treatment of Ulcerative Colitis Accompanied by Increased Bowel Movement (Diarrhoea)

Diarrhoea is frequent emptying of loose stool or bowel movement more than three times a day. Diarrhoea may be accompanied by abdominal pain and cramps and sometimes nausea and vomiting, and often no relief after emptying. Chronic diarrhoea, or diarrhoea lasting more than 20 days, may be present in all the above mentioned diseases, including celiac disease (gluten intolerance) as well as type 2 diabetes and colon tumours.

Chronic diarrhoea is accompanied by malaise, fatigue, and weight loss. If it lasts longer, it leads to loss of water (dehydration) and minerals, which can result in many serious complications. Diarrhoea is very dangerous in infants, toddlers as well as in younger and older children and in the

elderly. For both of these age groups, prolonged dehydration could end up with serious health complications and even death. Dehydration leads to a decrease in blood volume and blood pressure. Some organs may suffer from both lack of oxygen and reduced intake of nutrients. Lack of minerals endangers the functioning of the heart, kidneys, and nervous system.

The primary treatment for diarrhoea is replenishment of fluids and salts. Very suitable is the application of drinking therapy with the Carlsbad mineral water, which contains all the essential minerals and trace elements as described above. When one complies and observes sufficient drinking regime, diarrhoea subsides after a few days.

Warning: Drinking large amounts of mineral water results in exceeding the absorptive capacity of the colon. Accumulation of water dilutes the stool and leads to diarrhoea. Warmer mineral water, 60°C or more, decreases frequent emptying, while the mineral water of 40°C or less tends to rather increase it. Water temperatures between 40°C and 55°C do not affected normal frequency of defecation.

Recommendation for Drinking of Mineral Water for Supportive Treatment of Ulcerative Colitis Accompanied by Decreased Bowel Movement (Constipation)

The normal frequency of bowel movements is one to two times a day. If emptying takes place every three days, according to other writers less often than three times a week, then we deal with constipation. However, we should keep in mind that the rate of discharge is related to food and fluid intake. The important criterion is regularity of defecation, which is not accompanied by pain, not the frequency of defecation. In extreme cases during a lower intake of both food, such as residue-free diet, and fluid, frequency of defecation even once every two weeks is acceptable.

Constipation affects approximately 30 per cent of the adult population. It is more common in women than in men. Constipation also affects mainly older people who drink little. A risk factor causing constipation includes poor diet, such as inadequate intake of dietary fibre. Other causes of constipation, which may accompany many diseases, include ulcerative colitis and cancer of the gastrointestinal tract, as well as inflammation of other internal organs, such as bladder or uterus. Constipation can be a side effect of febrile diseases, spinal injury, or haemorrhoids.

Apart from a number of recommended treatments of constipation by laxatives through bulking intestinal lumen and softening stool (swelling fibre), oleic and osmotic laxatives (Glauber's salt, mannitol, sorbitol, lactulose), it seems that very effective laxative effects are produced by drinking Carlsbad mineral water. Carlsbad water itself has no laxative properties, but thanks to the mineral content, it stimulates the hormonal regulation of bowel motility. The daily ritual of regular drinking of mineral water prevents dehydration of intestinal contents and in conjunction with regular physical exercise (walking) and the intake of food containing more fat, positively affects the intestinal peristalsis and sets the regularity of a daily bowel movement. During drinking therapies focused on constipation treatment, laxatives are not recommended, as they could cause the complete emptying of intestinal contents or diarrhoea, leading to no bowel movement for days. Constipation would be avoided, but recurrent diarrhoea would cause undesirable loss of fluids and minerals. Table 5 summarizes the application of mineral water for the treatment of ulcerous diseases of the gastrointestinal tract depending on the activity of the intestine.

Table 5 Application of drinking therapy for idiopathic inflammatory and ulcerous diseases of the gastrointestinal tract

Disease	Concentration Temperature	Volume of daily doses Daily drinking schedule	Intake method	Treatment schedule Notes
<i>Ulcerative colitis with increased intestinal peristalsis (diarrhoea)</i>	<i>0.5 % 60°C</i>	<i>Initially 4 times daily 100 ml After improved bowel movement 300 ml in the morning on empty stomach Later depending on state of bowel movement, 200 ml, 1-3 times a day, 35-60 minutes before meals</i>	<i>Small, slow sips</i>	<i>Take 3-6 weeks</i>
<i>Ulcerative colitis with reduced intestinal activity (constipation)</i>	<i>1 % or 2 % with intestinal atony 30°C with intestinal cramps 60°C</i>	<i>400 ml 4 times daily 45 min before meals</i>	<i>Small, slow sips</i>	<i>Take 3-5 weeks 200-600 ml 0.5–1 % solution at 30°C on empty stomach</i>

In recent years, a new method called *colon hydrotherapy* or washing the intestines with Carlsbad mineral water became popular in Carlsbad spas. Opinions of experts about this treatment vary. This therapy is not suitable for every patient and its use should be decided by a physician.

Liver, Bile Duct, and Gallbladder

Chronic Inflammation of Liver (Hepatitis) and Cirrhosis (Except for Period of Disease Worsening)

The liver is the largest central organ of metabolism. It secures the running of vital functions and inside it, metabolism of carbohydrates, fats, proteins, and other substances takes place. All factors required for the clotting of blood are formed there. Here, from the blood pigment (haemoglobin) bilirubin arises. Furthermore, the liver produces bile acids which are essential for the digestion of fats. Then they turn into cholesterol, an important component of cell membranes syntactic. The liver is the storage of glycogen, which is the source of energy for all metabolic processes in the organism. It converts waste products and toxic by-products, such as ammonia formed during protein metabolism, into urea. The liver neutralizes harmful substances from food, toxic components of medication, and alcohol. Specialized *Kupffer cells* in the liver are removing foreign particles and microorganisms from the bloodstream.

The liver has a high ability to regenerate, but long-lasting burdens, such as unsuitable food or frequent intoxication with drinks, drugs, and pharmaceuticals, can irreversibly damage the liver activity. Consequences of liver failure are immediately reflected in the function of other vital organs, such as brain, heart, and kidneys and they always pose a serious threat to life.

Chronic liver diseases in Carlsbad have been traditionally cured since the late 19th Century. After WWII, in connection with the spread of infectious hepatitis A, cured patients were sent to the Carlsbad spa to recuperate. Thanks to the spa therapies, the general condition of patients has improved. Painful feelings in their stomach and loss of appetite disappeared and biochemical indicators have normalized. Health improvement occurred not only in chronic infectious liver

diseases, but also after acute liver damage by alcohol, industrial poisons, drugs, and after mushroom poisoning.

Currently, much attention is devoted to the issue of serious treatment using Carlsbad drinking therapies for patients whose liver function was damaged to varying degrees due to overuse of a variety of drugs, including alternative medications and food supplements (polypharmacy). These are almost always elderly patients who suffered for years from non-infectious diseases, most often from type 2 diabetes, cardiovascular or kidney diseases.

It turns out that Carlsbad treatment in such cases has a positive effect, since it supports the detection and neutralization of toxic and potentially toxic substances in the liver, as well as their secretion into bile. This drinking therapy contributes to the overall detoxification of the body. It improves the overall condition of patients. It increases appetite and as a result in severe cases, many symptoms characteristic of chronic fatigue syndrome disappear.

Treatment options for liver transplant patients have been evaluated and even some transplant patients were already successfully cured by drinking treatment with Carlsbad mineral water. However, attempts to cure patients suffering from chronic diseases of the liver accompanied by oedema and varicose bleeding in the oesophagus and stomach, which restricts the supply of the liver, were not too successful. Table 6 shows applications of mineral water for the treatment of hepatitis and cirrhosis.

Table 6 Application of drinking therapy for the treatment of chronic hepatitis and cirrhosis

Disease	Concentration Temperature	Volume of daily doses Daily drinking schedule	Intake method	Treatment schedule Notes
<i>Chronic hepatitis and liver cirrhosis</i>	<i>0.5 % 45°C</i>	<i>Initially 3 times daily 100 ml Later gradually increase the dose to 200 ml, 45 min before meals</i>	<i>Small, slow sips</i>	<i>Take 4-6 weeks Drink morning dose in bed, attach wrap to liver area, repeat in half a year</i>

Chronic Inflammation and Dyskinesia of the Biliary Tract (Cholangitis) and Chronic Inflammation of the Gallbladder (Cholecystitis)

Chronic inflammation of the bile duct (cholangitis) may occur as a result of obstruction or stasis of flow of bile in the biliary tract. This can be caused by a number of causes, such as tumours, gallstones, post-infectious inflammation caused mainly by intestinal bacteria. It manifests itself by chills, fever, and jaundice (Charcot's triad), and is often accompanied by pain in the upper right abdomen. The course and biliary dyskinesia symptoms are similar to the inflammation of the gallbladder (cholecystitis), but it does not occur with the formation of gallstones. The disease may be associated with the increased mobility of the gallbladder (hypertonic type of dyskinesia) or its mobility is reduced (hypotonic type of dyskinesia).

The inflammation of the gallbladder or cholecystitis is considered one of the most common diseases of the digestive tract. It is caused by bacterial or viral infections and in most cases it is preceded by the occurrence of gallstones in the gallbladder (cholelithiasis), or in biliary tract (choledocholithiasis). The occurrence of gallstones is more frequent in women, but in general, it affects people with high work stress and poor eating habits. The main symptoms accompanying cholelithiasis are the already mentioned abdominal pain in the upper right abdomen, jaundice (icterus), and vomiting after some particular fatty foods.

If those diseases of the gallbladder and biliary tract are not treated in time, or if the biliary tract is not released and cleared in time, a secondary liver damage (cirrhosis) can occur. Moreover, a

blockage of the pancreas outlet and subsequent inflammation of the pancreas (pancreatitis) might occur.

Treatment of cholecystitis and biliary dyskinesia is difficult. It is treated either conservatively with antibiotics, analgesics, and antipyretics, or with surgery. Equally important is the appropriate diet and eating habits both during treatment and during recovery. The drinking therapy using Carlsbad mineral water is a very appropriate and traditionally proven supportive treatment. We should stress that for each patient, this treatment should always be assessed by an experienced physician. An uncontrolled overuse of the drinking therapy could lead to increased mobility of the gallbladder and cause painful symptoms.

In this context we must point out that controlled drinking of Carlsbad mineral water increases the liver glycogen storage. Glycogen is an essential energy source for almost all metabolic processes, particularly for the energy required for liver functions, formation of liver enzymes, and regulation of blood sugar. It increases the ability of liver to absorb more blood bilirubin and bile acids and transport them into the bile. It causes the secreted bile to be less thick as it better flows through the biliary tract, so it also facilitates the emptying of the gallbladder after eating.

Experimental animal models on rats have shown that drinking Carlsbad mineral water does not harm liver cells. In fact it regenerates and normalizes experimentally induced liver damage caused by chemicals and surgery. Table 7 shows appropriate supportive treatments of the aforementioned diseases using Carlsbad mineral water therapy.

Table 7 Applications of drinking therapy for the treatment of cholangitis, biliary dyskinesia, cholecystitis and conditions after removal of gallbladder

Disease	Concentration Temperature	Volume of daily doses Daily drinking schedule	Intake method	Treatment schedule Notes
<i>Biliary dyskinesia and chronic cholecystitis</i>	1 % 45°C	<i>Initially morning: on empty stomach 400 ml Noon: 200 ml Evening: 400 ml Later gradually increase Morning: On empty stomach 600 ml Noon: 200-300 ml Evening: 600 ml Drinking period before meal depends on the state of gastric secretion</i>	<i>Small, slow sips Take 10-15 min break between cups</i>	<i>Take 3-6 weeks After completion of preventive therapy, in the morning, on empty stomach drink 200 to 400 ml of warm 1 % solution 30°C We recommend walking while drinking</i>
<i>Condition after removal of gallbladder</i>	1 % 45°C	<i>Initially 200 ml, 3 times daily, then increase dose to 300-400 ml 45 min before meals</i>	<i>Small, slow sips</i>	<i>Take 3-4 weeks You may repeat this drinking therapy 1-2 times a year</i>

Pancreas

Chronic Recurrent Inflammation of the Pancreas (Pancreatitis)

Pancreas excretes pancreatic juice into the duodenum, which neutralizes the acidity of the digested food coming from the stomach. Pancreas produces insulin and glucagon hormones, which play an important role in carbohydrate metabolism. Insulin decreases the blood sugar level and

increases its consumption in tissues, while glucagon has the opposite effect. Both hormones thus regulate the production and consumption of energy in the body.

Chronic recurrent pancreatitis occurs as a result of relapses of acute pancreatitis, alcoholism, diseases of the gallbladder and biliary tract and metabolic disorders. The disease has typical symptoms, particularly pain in abdomen and back, and sometimes even jaundice. Because secretion of pancreatic juice is impaired, it leads to digestive disorders such as malabsorption syndrome, and the fat content in the stool increases (steatorrhea). Another symptom is type 1 diabetes, which results from inadequate insulin production. Diabetes is accompanied by swelling and frequent purulent inflammation that ultimately leads to necrosis of affected tissues. Table 8 shows appropriate supportive treatments of recurrent pancreatitis using Carlsbad mineral water therapy.

Table 8 Application of drinking therapy for recurrent pancreatitis

Disease	Concentration Temperature	Volume of daily doses Daily drinking schedule	Intake method	Treatment schedule Notes
Chronic recurrent pancreatitis	1.0 % 45°C With diarrhoea 60°C	<i>Initially: 100-200 ml 3 times a day Then, when tougher stool steadily increase to Morning: 400 ml Noon: 200 ml Evening: 400 ml Always on empty stomach</i>	<i>Small, slow sips Drink first cup in 3 min Drink next cup in 5 min Break between cups 10-15 min</i>	<i>Take 3-6 weeks Long term drink 200-400 ml 1 % solution in the morning on empty stomach</i>

Metabolic Diseases and Disorders

Type 2 Diabetes (diabetes mellitus)

Carlsbad mineral water drinking therapies do not cure diabetes directly, but improve action and secretory activity of the pancreas. They increase the production of pancreatic juice and insulin, and thus indirectly cause a decrease in blood sugar and promote its use in tissues. They also have a positive effect on water and mineral balance of the organism, which in a diabetic disease is always upset.

Patients regardless of age and degree of obesity, after drinking therapy exhibited improvement of their general condition, reduction of blood sugar concentration, and decrease of ketonuria or disappearance of acetone from urine. Complex Carlsbad spa treatment, which is a drinking therapy supplemented by specific diet and adequate physical activity, can reduce medication burden, including insulin administration. It also optimizes the overall state of health, while the improvement persists for several months thereafter.

Overweight and Obesity

Overweight and obesity or excessive fat storage in the body, is caused by an imbalance between the amount of energy ingested and expended by physical activity. The organism stores unused energy as body fat. Obesity is a cause for other life-threatening diseases, such as myocardial infarction and stroke.

Carlsbad treatment reduces elevated cholesterol (hypercholesterolemia) and other fat components (hyperlipidaemia) in blood. The treatment does not reduce elevated levels of plasma lipids, or the so-called neutral fats (95 % are triglycerides), which regulate the creation and consumption of energy in the body. When treating obesity with drinking therapies, it is also

necessary to improve diet. It is important to adhere to good eating habits, including regular schedule of eating a better diet. Obese people should limit high-calorie diet, and if possible, reduce the number of medications, especially diuretics, beta blockers, and corticosteroids.

Gout (Gouty Arthritis)

Gout is a chronic inflammatory joint disease caused by increased concentration of uric acid in blood serum. Higher levels of uric acid may be caused by several mutually independent mechanisms. Examples include its increased formation, its reduced removal by kidneys, or prolonged intake of food containing high amounts of purines, when taking certain drugs, as well as disorders of metabolism of purines in certain diseases, such as leukaemia. Crystals of uric acid (urates) accumulate in articular cartilage and around the joints and tendons, causing repeated inflammatory outbreaks that are associated with acute pain and fever, and which later lead to degeneration of the joints. Urate deposits also accumulate in kidneys, mainly in the renal tubules and interstitium and cause build-up of organic stones (calculi) in kidneys, urinary tract, and bladder (urolithiasis) as seen below. Table 9 shows the general outline of supporting treatment of metabolic diseases.

Table 9 Application of drinking therapy for treatment of metabolic diseases

Disease	Concentration Temperature	Volume of daily doses Daily drinking schedule	Intake method	Treatment schedule Notes
<i>Metabolic disorders:</i> <i>Diabetes 2</i> <i>Gout</i>	0.5 % 45°C	<i>Initially: 500-1000 ml daily</i> <i>Morning: 200-400 ml on empty stomach</i> <i>Noon: 200 ml</i> <i>Evening: 400 ml</i> <i>Then gradually increase to 1300-1400 ml per day</i>	<i>Small, slow sips</i>	<i>Take 3-5 weeks</i> <i>2-3 times per year</i> <i>Strictly adhere to physician's advice</i> <i>Length of drinking after meals depends on the state of gastric secretion</i>

Kidneys and Urinary Tract

Prevention and Treatment of Urinary Stones (Urolithiasis), and Chronic Inflammation of Urinary Tract (Urethritis)

Unless excretion of water, minerals, and other substances by kidneys is impaired, treatment by drinking mineral water may be recommended. However, in patients who have urinary stones, drinking treatments can also be recommended, but we have always to take into account the chemical composition of the stones. It turned out that the treatment is effective only for stones consisting of oxalates and salts of uric acid or urates.

Urinary stones often occur in people who drink very little, thus urinate a little and as a result suffer from congestion. The same applies to patients who, although drink enough, have frequent and recurrent diarrhoea. As a result, they also experience high losses of water and thus produce little, but more concentrated urine. Carlsbad drinking therapy has beneficial medicinal effects on constipation and diarrhoea. It also inhibits the formation of urinary stones and positively affects irritation and inflammation of the urinary tract. Table 10 shows the general outline for prevention and supportive treatment of urinary stones and chronic urinary tract infections.

Table 10 Supportive treatment of urinary stones and chronic infections of urinary tract

Disease	Concentration Temperature	Volume of daily doses Daily drinking schedule	Intake method	Treatment schedule Notes
<i>Stones in kidneys and urinary tract</i>	0.5% 30-45°C	<i>Initially: 750-1250 ml daily</i> <i>Then gradually increase to 1250 ml per day</i>	<i>Small, slow sips</i>	<i>Take 3-4 weeks 2 times per year</i>
<i>Chronic inflammation</i>		<i>Morning: 400-600 ml on empty stomach</i> <i>Other doses evenly spread throughout the day, Last use in the evening before bedtime</i>		<i>Not recommended for Intestinal infectious</i> <i>Consider on-going illness of gastrointestinal tract</i>

Warning: The decision on whether a particular case of kidney disease should be alternatively treated with Carlsbad mineral water is the responsibility of your physician. During kidney failure with a tendency for swollen kidneys, any drinking therapy must be excluded.

Periodontitis and Other Dental Diseases

Mineral water obtained by dissolving Carlsbad thermal salt has been successfully used to treat various diseases of the oral cavity. Rinsing of mouth, or dental irrigation, with warm Carlsbad water keeps the balance of micro flora in the oral cavity, heals inflammatory gum disease or periodontitis, improves the health of teeth, and prevents the formation of bacterial plaque. It increases blood supply to the tooth socket and prevents periodontitis.

Cosmetic Problems and Skin Care

Regular warm baths prepared from Carlsbad thermal salt contribute to the perfect skin care and also treats skin diseases. Minerals and their balanced presence in Carlsbad thermal salt has anti-inflammatory effects and perfectly cleanse, disinfect, and refresh the skin. They relieve muscle tension and calm the overactive peripheral nervous system, which creates a pleasant feeling of total refreshment.

Baths optimize the blood supply to the skin and its regeneration, thus accelerating the treatment of a number of skin diseases, particularly psoriasis, dermatitis, eczema, and acne. They are also recommended during hypothermia and for relieving muscle and joint pain.

For the preparation of bath with temperature of 37 to 38°C, we recommend to add 25 to 50 g of Carlsbad thermal salt to the water. The average length of the bath should not exceed 15 to 20 minutes. People suffering from certain skin diseases should seek advice of their doctor on the suitability of baths.

Preparation of Mineral Water from Carlsbad Thermal Salt

The preparation of mineral water from Carlsbad natural salt requires pure spring water, saturated with carbon dioxide. You can buy it at any grocery store. Table 11 shows the preparation of solutions containing various concentrations of Carlsbad thermal salt. For the supportive treatment of individual diseases, it is necessary to heat thus prepared mineral water to the desired temperature and comply with the drinking therapy according to your physician's recommendation, as indicated in Tables 3 to 10. During the time between the drinking of water and subsequent food intake, avoid smoking for an hour because nicotine affects gastric juice secretion and gastric emptying.

Table 11 Preparation of 1 litre of mineral water

%	g	Tea spoons
0.5	5	1
1.0	10	2
5.0	50	5

Note: When adding salt to carbonated water, a reaction with the gas saturated in water takes place, contributing to a complete and uniform dissolution of the salt.