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Review Article

Fasting Therapy

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Abstract: The purpose of therapeutic fasting is the promotion and restoration of health. It is associated with experimental and physiological fasting in the sense that studies of the latter provide the knowledge and information which make therapeutic fasting possible.
Keywords: Fasting, Theraputics.

INTRODUCTION:

Therapeutic fasting is not the result of any particular new scientific discovery, but rather has proceeded to its present development as the result of centuries of experimentation, observation and study. It is today the culmination of a large number of scientific investigations and discoveries which have reached their climax during the past century. Fasting for therapeutic purposes is thus an important, though in popular conception, almost unknown, phase of the modern science of medicine, and as such it is the subject of our present inquiry and analysis. Let's also keep in mind that fasting is only one part of the total health-supporting program we call Natural Hygiene. Health results from healthful living. No matter how successful a fasting experience might be, it needs to be followed by a consistently healthy lifestyle. The requirements of health must continue to be provided, especially in the areas of diet, environment, activity and psychology. People, who undertake a fast in a supervised setting, tend to achieve health more quickly than those who attempt changes without a fast. The intensive health education, plus the emotional support they receive during their stay, results in increased compliance with dietary and lifestyle recommendations.

When individuals try to make major dietary changes without the benefit of a fasting experience, they often become frustrated. The transition to a healthful eating pattern can make you feel sick. Symptoms such as fatigue, nausea, vomiting, diarrhea, abdominal pain and bloating, joint pain, headaches, skin rashes, irritability, depression, etc. are just a few of the common problems that can arise as the body attempts to eliminate toxins, metabolic byproducts, etc., and adjust physiologically to a health promoting diet. It is difficult to get people to practice new healthful living habits for long unless they begin to experience some benefits quickly. Changes that may take months (or even years) with careful eating may occur much more quickly if a properly supervised fast is utilized. This is an important consideration because once people begin to realize their health potential; they become a likely candidate for a lifelong commitment to healthful living.

Fasting On Gastroenterology: Fasting relationship is very close to the digestive system, Ramadan practically does not mean anything other than abstaining from food and drink any omission of the digestive system with the performance of his mission or his job since sunrise to sunset, and thus constitutes a fasting rest of this device for more than 12 hours during which they may pick up his breath and restoration of many of the corruptions Over the whole month. This is a device that receives food and digest and turns and is the process of absorption of the elements useful and needed him, is responsible, then the feelings of satiety, hunger and appetite and fullness, but this machine psyche of its own reflected in various outburst of agitation and swelling, colic and indigestion ... etc., which is also the starting point also for many of our diseases, according to the words of the Prophet (r) «House stomach disease» During Ramadan show a lot of digestive problems, A large number of patients confused in rebate in the case of fasting or their breakfast, where wary of many of the complications

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that may inevitably vary from disease to another, so it has used doctors examine the cases of patients one by one to make the right decision. Fasting is beneficial for the digestive system But the consensus of doctors, all that is in the fast maximum benefit for the digestive system, but they do not float on the surface and do not touch it a lot of fasters ignorant of prayers because of the deviation from the objectives of the real health of Ramadan, and because of poor eating habits and overeating, which accepts it some of Ramadan to another.

Peptic ulcer:

The mean erosion topical in the mucous membrane lining the wall of the stomach or duodenal, as though there are secretions of the stomach containing a strong acid and enzymes digestive but there are effective mechanisms for the protection of the wall of the stomach and intestines: So the ulcer of the digestive system is not only a reflection of the failure mechanisms of protection following or hyperthyroidism secretion of the aforementioned articles and all this happens in the following cases: Infection is infected with the bacterium Helicobacter pylori or by the weakening of the mucous membrane of the digestive system. Excessive handling of some of the materials and drugs that cause erosion of the membrane of the digestive system as derivatives of aspirin and anti-inflammatory corticosteroids and materials, in addition to some factors, such as smoking and alcoholism.

Symptoms of peptic ulcer suffering patient of severe pain in the upper abdomen lasts for several days or weeks dims when eating or taking antibiotics for acidity and shows whenever human hair hungry, and of course there are several complications of these ulcers are summarized in weight loss, anemia and disruptions in the functions of the gastrointestinal tract as well as in the possibility of turning stomach ulcers to cancer. This is in addition to the complications of emergency, which is the occurrence of severe bleeding or erosion full and be a hole or slot perforation in the wall of the stomach or intestines, so the fear of patients with ulcers of the digestive system of the Ramadan fast merely reflects the suspicion of these complications that are serious if it happened. That has put doctors rules and conditions for the fasting patient ulcers of the digestive system, where they recommend breakfast when the patient complains of acute ulcer with symptoms of pain when hungry, as well as in the event of a severe setback when suffer from chronic ulcers, or persistent symptoms of ulcers of the digestive system with patients taking treatment regularly, and of course the breakfast is necessary in the event of complications of stomach ulcers or when prove examination endoscopic non-healing ulcers, despite follow treatment, while fasting obligatory in patients who had recovered from ulcers of the digestive system and who have demonstrated they have the examination endoscopy scar of peptic ulcers.

Indigestion:

It is a very loose description stating uncomfortable situation for the digestive system and the matter a number of symptoms that appear after eating a meal such as nausea and abdominal gas and bloating and abdominal cramps. All of these symptoms are a candidate for the disappearance during Ramadan if the person committed the system to eat a good balanced and moderate. Otherwise, overeating will lead to the aggravation of these symptoms, which can not in any way be calling for eating.

Diarrhea:

And leads to the loss of ample amounts of water and salts. Therefore, it requires the breakfast, especially if accompanied by fever and severe during the critical phase.

Reflux to the esophagus (stomach hernia): This means that some of the disease and digestive secretions that have the character of an acid in the stomach in order to digest the food go up from the stomach into the esophagus, which is the channel that connects the mouth and stomach Esophagi. If the mucous membrane of the stomach lining or protective does not affect where these juices, the esophagus lacks such Lining Therefore, these secretions flowing towards the top cause burning sensation. This feeling is caused heartburn and reflux in particular the presence of gastric hernia, and this happens hernia particularly in people suffering from obesity and obesity, especially among women around the age of thirty. In this particular case the patient not has of any symptoms but may suffer from heartburn and acidity, especially when the stomach is filled with food or doing too much by leaning forward or when lying on the bed where Part of the contents of the stomach back. Doctors recommend this sample of patients to eat small meals at breakfast taking care to take medication regularly and stay away from fatty diets and quitting smoking, coffee and combat obesity in particular. As these patients are advised to leave for up to 4 hours between meal eating and sleeping. But in the case of whether the patient felt uncomfortable or form Ramadan burden to him or worsened symptoms breakfast he can ward off complications. Operations cut the stomach: They are patients who have already undergone an interest to the digestive system, stomach ulcer, for example, has been cut or remove a portion of their stomachs. These patients due to lack of the remaining portion of their stomachs may have to eat small meals and frequent eating. Therefore, they cannot fast in most cases.

5 - Irritable Bowel Syndrome: We mean by a group of symptoms that include abdominal cramps, bloating, diarrhea, constipation, a very common disease that affects 30% of people. The doctors diagnosed the disease after getting a thorough history of the situation and ask about the quality of food stimuli and psychological potential for irritation of the colon and in

all cases remain blood tests and examinations natural telescope.

Attention to nutrition is the first step in treatment, if the patient noticed that certain foods or liquids provoke symptoms, he avoided. The doctor adds drugs often pay the symptoms of the disease in the patient. Acting IBS patients differently during Ramadan, and if the patient was aware of his world in details often take the necessary precautions during eating in Ramadan shall judge this month in good health, but may improve symptoms, especially since Ramadan is commonly an atmosphere of tranquility within the soul and calms the nerves and pushes the tension. If the patient's illness and unknowing ignorant of its causes and gone during this month in overeating and lack of food selection. It is expected to worsen symptoms and feel more without a little fatigue and discomfort. In general, each patient list of foods banned by up to himself through experience, but with so doctors advised all IBS patients to stay away from caffeine, and vegetable-producing gases like bean , cabbage and dairy products and fatty foods and soft drinks ... etc..

6 - Gallstones In most cases, the gallstones not Couse the appearance of any symptoms but with that always involve potentially dangerous. The gallbladder stores bile juice which is one of the secretions of the liver to facilitate the process of digesting fats; this includes sound bitterness balanced amounts of bile acids and cholesterol, but rises when the concentration of cholesterol is made up of gravel. Cause gallstones in the incidence of sudden sharp pain and for several hours usually begins after eating and start this pain on the one hand and wrap the liver to the back and sometimes accompanied by nausea and fever.

7 - Liver disease For liver disease is recommended doctors' breakfast in a lot of cases that affect the overall health of the body, especially in advanced disease like liver Cirrhosis and liver tumors in the incidence of acute viral hepatitis. The cases of dropsy in the abdomen.

Measures are necessary: In the latter has to be noted that fasting is always a rest of the stomach is shrinking throughout the day in the days of fasting after eating because of stretched throughout the year, helping to heal the wounds of small. But our food during Ramadan should remain as it was always balanced and rich foods slow digestion where you must avoid fatty foods or sugar-rich and not drinking too much coffee, tea, and training to quit smoking ... etc.. Then checks the Tomb of Dr. Shelton a pioneer treatment fasting «The stomach ailing or weak benefit from the respite offered by her fasting Improved level of function and increase the activity and return after fasting to work energetically more» is achieved as well as pointed out by Dr. Dewey «Fasting is considered as comfort hospital. The comforts not heal a broken bone or wound healing but create all the necessary conditions for healing ». This is exactly what the benefit of the stomach and also benefit from the gastrointestinal tract during Ramadan.

Fasting and diabetic patients: Medical research has shown that modern fasting does not constitute a danger to most people with diabetes, if not benefit many of them.

In research conducted by Dr. Riad Soleimani and his colleagues at the Faculty of Medicine at King Khalid University, (1990), about the effect of Ramadan fasting on the control of diabetes, when 47 patients with Type II 2, and when a group of people who do not suffer from this disease, have been identified body weight protein, diabetes, hemoglobin diabetes, before Ramadan, and immediately afterward, when each of the two groups. was measured glycoprotein, (Glycosylated Protein) when 9 of the patients with diabetes, has been observed that there has been no change in weight in these patients as it was before Ramadan (75.2 12.8) versus (75.1 12.4) kg after him, as there has been no change in the hemoglobin diabetes, (Glycosylated Hemoglobin) as it was before Ramadan (10.9 3.1) vs. (10.5 2.8) mg / ml after 100, there has been no change in the glycoprotein (Glycosylated Protein), where he was (1.19 +0.35) versus (1017 0.39), mg / 100, after the end of the Ramadan fast. In the group that its members do not suffer from diabetes; has observed a significant reduction in weight during fasting (74.2 10.4) Kg, versus (72.5 +10.2) kg, however, there has been no significant change in hemoglobin diabetes (Glycosylated Hemoglobin).

The researchers concluded from this that the fasting month of Ramadan does not cause any significant loss in body weight, and has no effect on the control of diabetes in disease type II (d). Furthermore, Dr. (Olufonsho) and his colleagues at the Faculty of Medicine King Khalid University Hospital in Riyadh, (1990) distributed a questionnaire on 203 diabetic patients (89 males and 114 females) in order to assess their perceptions, attitudes, and practices, during the month of Ramadan. He has more of these (89%), fasting Ramadan, and had the lowest percentage of Siam (72%) when those who are under the age of twenty, he admitted only 12% that they are taking a greater degree of food during Ramadan, while mention a greater number of whom 27% said they consume deal the largest of sweets, said more than a third (37%) that their activity bodywork least in Ramadan, and the weakness of this activity was more common in those who did not fast Ramadan (61%) than among those who fasted it (35%), and expressed a large number (59%) said they felt improvement in their health during the month of Ramadan, did not hesitate to hospitals in emergencies, only (5.6%) of them, while not exceeding the proportion of hospitalized because of diabetes (5%)

For those who did not fast, this was less positive results, expressed as (10%) of them only for improved health, with increased emergency revisions to the hospital (15%), and wrap the cases of hospital admission (15%).

There was a widespread belief among (75% of patients) that the fasting month of Ramadan leads to improved health, and this was a strong feeling among patients who fasted the month (80%) compared to those who not fasted it (26%). The study showed that most of the diabetes, prefer fasting month of Ramadan, and they believe that it had a positive impact on their disease. Has proved Barber (Barber SG) and his colleagues of the year 1979 in Birmingham, that there is a change a bit in the control of diabetes when fasting Muslims, and that the number of patients to clinics sugar has decreased, and there is no increase in the rate of detention of diabetic patients high and uncontrolled, within the hospital During the month of Ramadan. Jukir and his colleagues in 1987 to study included 52 patients of diabetic 0.20 of them are dependent on insulin therapy, and 32 of them are not dependent on insulin, was found to be 15 patients who are not dependent on insulin, the less weight and decreased levels of sugar (Glucose Levels) have after fasting, before him to fast. As I said insulin dose by 10% from the usual when the group that relies on insulin therapy, say the weight of seven of them, while the rate of sugar when the rest of the group, so advised researchers with special care for these patients, if they wanted to fast all the days of the month of Ramadan, there is nothing wrong them afterwards. As some recent studies have proven that there is no pathological change or any clinical complications in patients with diabetes who fasted during Ramadan in the following components: - Blood glucose - hemoglobin - insulin - cholesterol - and triglycerides, and body weight. Taking into account the need to take care of patients adjust their doses pharmaceutical and practicing their daily activity and in their diets, especially patients who are taking insulin. The diabetes that are advised not to fast has been identified by the comprehensive evaluation study conducted by Dr. Soleimani and colleagues about diabetes and fasting Ramadan in the year 1988 and are as follows:

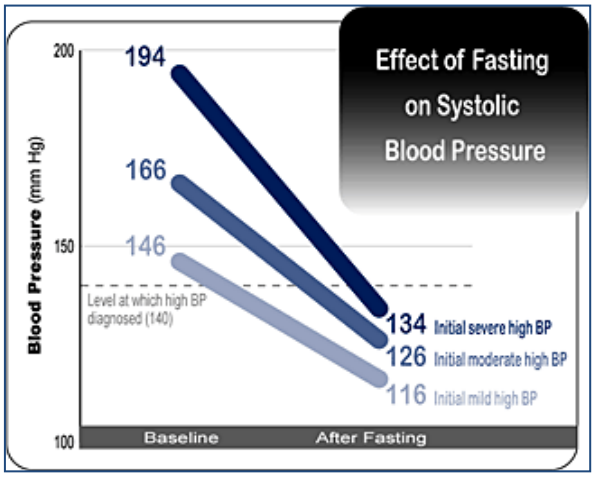
- patients who are at increased ketone bodies in the blood
- Patients who suffer from a large swing and speed of change in their glucose level.
- Pregnant.
- Children with diabetes.
- Diabetics who suffer from serious medical complications such as kidney failure or angina pectoris.
- diabetics who suffer from serious illnesses such as severe blood poisoning, (Sever sepsis), or congestive heart failure (Congestive Heart Failure) And allows fasting for the rest of the patients, and patients who accept medical advice and encourages fasting for obese patients of the second type who does not rely on insulin, except for pregnant women and nursing mothers who have sugar steady with an increase in weight over 20% of the ideal weight.

Effect of fasting on heart health: The heart muscle does not diminish appreciably, deriving its sustenance from the less essential tissues. Its rate of pulsing varies greatly, rising and falling as the needs of the system demand. Studying the respiration rate, Benedict noted various minor fluctuations and arrived at the conclusion that "at least during the first two days of the fast, the pulse rate is much more liable to fluctuations than the respiration rate." That fasting benefits the heart is certain from the results obtained in functional and even in organic heart "disease" during a fast. This arises from three chief causes--namely, (1) it removes the constant stimulation of the heart; (2) it takes a heavy load off the heart and permits it to rest; (3) it purifies the blood thus nourishing the heart with better food. The heart that is pulsating at the rate of 80 times a minute pulsates 115,200 times in twenty-four hours. Shortly after the fast is instituted, the heart rate decreases and, while it may temporarily go much below 60 pulsations a minute, it ultimately settles at 60 beats a minute and remains there for the duration of the fast. This is 86,400 pulsations in twenty-four hours, or 28,800 fewer pulsations each day than it was doing before the fast. This represents a decrease of twenty-five per cent of the work of the heart. The saving in work is seen not merely in the reduction of the number of pulsations, but also in the vigor or force of the pulsations. It all sums up to a real vacation--a rest--for the heart. During this rest the heart repairs its damaged structures and replenishes its tissues. As shown elsewhere, the heart muscle loses only three per cent by the time death occurs from starvation. As in other essential tissues the loss of this small per cent occurs after the exhaustion of the body's nutritive reserves--that is, during the starvation period. This ability of the body to nourish the heart during a prolonged fast is a sure guarantee against damage to the heart resulting from the fast.

Effect of fasting on blood pressure: Hypertension is a disorder characterized by chronically high blood pressure. It must be monitored, treated and controlled by medication, lifestyle changes, or a combination of both. Fasting is without doubt the most rapid and effective method of remedying high blood pressure. Indeed, hundreds of consecutive patients have been treated for this condition without a single complete failure. Even patients who have failed to respond to all of the customary treatment of high blood pressure do respond to fasting. Shelton has reported one case in which a systolic pressure of 295 was brought down to 115 during three weeks of fasting. And the cures in these cases tend to be lasting. If the blood pressure falls below normal during the fast, it will rise to normal later,

but actual hypertension does not redevelop so long as good nutritional habits are maintained after the fast.

Heart disease has been treated by fasting in a very large number of cases. Fortunately the most common causes of heart trouble — narrowing of the coronary artery and formation of thrombus in this artery — are usually corrected by fasting. As a rule the thrombus and excess fatty material lining the walls of the artery are absorbed by autolysis during the course of the fast. Other heart diseases, such as acute myocarditis, fatty overgrowth of the heart, endocarditis and ordinary pericarditis also respond very favorably to fasting. Two less common heart conditions, hem pericardium and calcified pericardium, can usually be remedied only partially when any form of help is possible.



(naturopathydigest.com)

Effect of fasting on blood clotting: Besides effectively lowering blood pressure, fasting removes and softens the cholesterol plaque that lines the blood vessels. . . Surgery, atherectomy, and angioplasty, the invasive approaches to coronary artery disease, will always remain ineffective at significantly extending life. This is because these procedures address only the localized blockage. This small area of diseased blood vessel, though it may be the source of chest pain, will not necessarily be the area that causes death should a person suffer a fatal heart attack. Concentrating on a localized area of coronary artery narrowing in a body full of vessels with diffuse atherosclerotic plaque is like trying to save a patient with advanced metastatic cancer by removing one surgically accessible mass. “Fasting thins the blood and prevents blood clots, or thrombi. Platelets do not clot as easily during fasting, and the ability of the red blood cells to clump together is diminished. Therefore, the fast quickly lowers an individual’s risk of a heart attack.

The Effect of fast on the brain and nervous system: Many scientists have sought to explain the underlying mechanism by which fasting therapy corrects abnormal and unbalanced psycho-physiological systems, and restores health so efficiently. Its stabilizing effects on the. Nervous system has been measured electrically through brain wave recordings and its effects on the endocrine glands have been traced bio-chemically. Both sets of findings tend to confirm that fasting allows the autonomic systems of the body to function at a relaxed baseline level, free from the erratic and disruptive influences of the nervous system and hormones. Suzuki et al. in 1976 studied changes in the brain waves from 262 fasting patients and noted a slowing and synchronization of alpha waves, together with an increased incidence of theta waves. *1 These observations are descriptive of a more relaxed and introspective state of awareness, which is less neurotically preoccupied with the superficial and transitory patterns of thought that characterize the normal waking state. Similar brain wave alterations were recorded in Zen meditators by Kasamatsu and Hirai (1966) *2 and by Banquet (1973) in subjects practicing japa yoga. *3. This suggests that fasting and meditation exert similar psycho-physiological influences on the brain and nervous system, perhaps healing psychosomatic complaints and maintaining optimal health and wellbeing by a single common mechanism.

The significant slowing of brain waves suggests that fasting induces a transient slowing down of the central nervous system. It seems plausible that more complex changes in the autonomic nerves and endocrine glands may then occur. An over active autonomic nervous system, which constantly relays abnormal mental and psychic stresses into the physiological systems, produces many psychosomatic symptoms and disease states, Through fasting and meditation these stresses are removed, allowing the mechanisms responsible for blood pressure, respiratory and cardiac rate, gastrointestinal secretion and motility, etc. to revert spontaneously to a more natural level of functioning. In Suzuki's study, this brain wave phenomenon disappeared upon termination of fasting therapy, and peak EEG frequency and wave configuration returned to a pattern strikingly similar to pre-fasting discharge patterns. However, in a more recent Japanese study of 380 fasting patients *4, where the EEG analysis was more sophisticated, peak frequency decreased significantly at the end of the fasting period, suggesting that a stable new physiological state is created in the post-fasting period. In addition, the overload of fast beta waves observed in the pre-fasting period decreased in the fasting period, and did not reappear again in the same fashion after the recovery phase. As these faster waves have been associated with anxiety, tension, neuroticism and irritation, their disappearance on EEG may be an objective indication that fasting either partially or totally eases these symptoms permanently.

Recently, the metabolic changes induced by fasting have also been investigated. The normal metabolic fuel of the brain is glucose, released into the bloodstream from the digestion of dietary carbohydrates and sugars. The research of G.F. Cahill of Joslin Research Laboratory, Harvard Medical School, USA (1966-1969), revealed that this situation changes dramatically during fasting. As the fast proceeds, the body's stores of carbohydrates in the liver are rapidly exhausted, and the brain's requirements for glucose, its sole fuel, must then be met by noncarbohydrate sources. The new source is the ketone body, derived from the hydrolysis of fat stored in the body's adipose tissues. It appears that the brains switch from starch to ketone nutrition works as a strong stressor upon the brain cells, and temporarily places all biological mechanisms in a stress state. This may activate the natural healing power inherent in the human body, thereby bringing about homeostasis, and a return to healthy function.

As for the headaches during fasting, dividing to: Patients with chronic migraines by the holy month of Ramadan, and there are some cases improved fasting, especially if they are smokers Ramadan month is like a great opportunity to quit smoking once and for all, but in cases where the patient re-migraine attacks advising him tostart of treatment on dinner food (suhoor). Those who suffer from headaches during fasting ,the reason is diet and hunger in Ramadan when some fasting is hunger Psychological hunger is not contagious and therefore note that fasting during the day combines the delicious and desirable. Himself and his greed hungry from food and put it on the breakfast table and after breakfast does not find it eat only a part of this amount, and this denotes the feeling of hunger is hunger myself more than hunger actual terms that the body needs very little food to fill the gasp and must be in control of this hunger Psychological where we are waste a lot of the foods we claimed to provide to the actual need. And stalking fasting headache not only during fasting but approximately one hour after breakfast and the reason for this is due to the disruption of meals at breakfast and in order to be healthy and balanced food in quantity and quality must take into account the following:

- The breakfast starts drinking it warm to alert juicers gastrointestinal tract because then excreted few sugars or starches to feed the brain, which needs to prices and then a few hours later start fasting food ordinary and not so frequently does not get lazy or headaches.
- Must contain all of the food breakfast on the amount of vegetables and fruit to stimulate the nervous system in the brain is fasting during the day and not feeling headache and laziness.
- Of the bad habits of some fasters is sleep and inactivity and obesity, which is also the most dangerous diseases of this age because of the lack of burning what to eat fasting at dinner (suhoor).

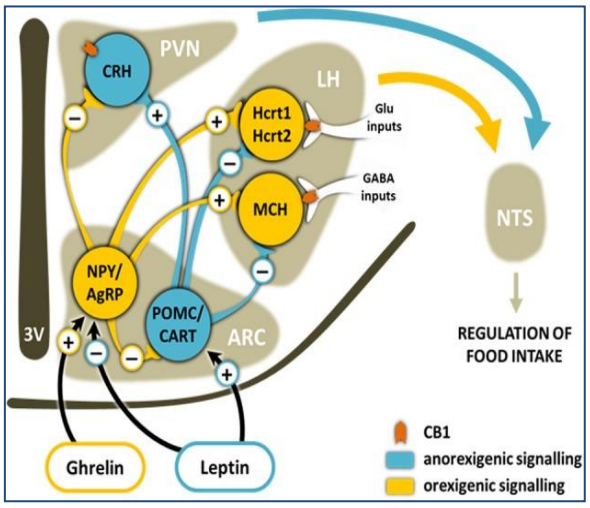
There are some tips that we provide to our patients, some of the brain, nerves, whose illness prevents them from fasting:

- Patients who have suffered a previous stroke and brain due to lack of repeat clots.
- Seniors (over sixty or seventy has happened to them early warning of a heart stroke incidence.
- Some brain tumors.
- Epilepsy patients who are taking continuous treatment.

Fasting Boosts Neuronal Autophagy:

Autophagy, or "self-eating," is the process by which cells recycle waste material, down regulate wasteful processes, and repair themselves. Brain health is highly dependent on neuronal autophagy. In fact, a recent paper shows that deletion of an "essential autophagy gene" in the hypothalamic neurons of fetal mice resulted in metabolic derangement (more body fat, poor glucose tolerance) and impaired neuronal development. Another study shows that disruption of neuronal autophagy induces neurodegeneration. Simply put, without the process of autophagy, brains neither develop properly nor function the way they should.

Fasting Increases Levels of Brain-Derived Neurotrophic Factor (BDNF): BDNF is a protein that interacts with neurons in the hippocampus, cortex, and basal forebrain (the parts of the brain that regulate memory, learning, and higher cognitive function – uniquely human stuff). It helps existing neurons survive while spurring the growth of new neurons (neurogenesis) and the development of synapses (lines of communication between neurons). Low levels of BDNF are linked to Alzheimer's, and supplementary BDNF prevents neuronal death, memory loss, and cognitive impairment in an animal model of Alzheimer's disease.



Schematic representation of the main brain pathways involved in the homeostatic control of food intake. (researchgate.net)

Ketone bodies like hydroxybutyrate are famously neuroprotective, and fasting often induces ketosis. Increased autophagy and BDNF and ketones from fasting sounds awesome, but do they manifest as actual benefits to neurological health? Let's see what the research says. No discussion of fasting and neurological health research is complete (or can even be initiated) without including Mark Mattson. Mattson, chief neuroscientist at the National Institute on Aging, has been releasing paper after paper on the neurological effects of intermittent fasting for the past dozen years, and he's amassed an impressive body of work that suggests IF can induce neurogenesis and protect against brain injury and disease. In the following sections, I'll discuss the evidence – from Mattson and other researchers – for the beneficial effects of fasting on neurological health across a spectrum of conditions.

Stroke:

The most common type of strokes are ischemic strokes (composing about 88% of all strokes) - cerebrovascular events in which a blood vessel that supplies blood to the brain is blocked by a clot. Without blood, the brain can't get oxygen or nutrients, and (often permanent) brain damage can occur. In an animal model of ischemic stroke, fasting up regulated BDNF and other neuroprotective proteins, reduced mortality and inflammation, and increased cognitive health and function. However, it's worth noting that fasting was most effective against stroke in young animals, who enjoyed a four-fold increase in neuroprotective and neurogenerative BDNF. Middle aged mice saw a two-fold increase in BDNF, while older mice saw no increase. Post-stroke cognitive function had a similar relationship to age and feeding status; young and middle-aged fasted mice retained far more than old mice and fed mice. Fasted mice displayed lower levels of inflammatory cytokines, but this effect was also modulated by age. Overall, fasting increased neuroprotective proteins and decreased inflammatory cytokines in young and middle-aged mice, thereby reducing the brain damage incurred by stroke.

Brain Trauma: Research indicates that fasting is also effective against physical trauma to the brain. It's not that fasting somehow physically repels impending trauma by generating a magical ketone-powered force field; it's that fasting reduces the oxidative stress, mitochondrial dysfunction, and cognitive decline that normally result from brain trauma. Employing one of these contraptions, researchers induced a "controlled cortical impact" on fasting rats and found that a 24-hour fast (but not a 48-hour fast) was neuroprotective. Perhaps the reduced appetite that commonly accompanies a concussion is a protective mechanism rather than an annoying side effect?

Cervical Spine Injury:

Injury incidence with upper 95% CI during training "Every other day" fasting was neuroprotective following an injury to a rat's cervical spine. Despite extensive trauma, fasted rats improved gait pattern, vertical exploration, and forelimb function (all heavily dependent on brain function). Neuronal integrity was preserved, cortical lesion volume was reduced, and corticospinal axon (nerve fiber) sprouting increased. The same team performed a similar study on mice suffering from a spinal cord injury, but had very different results; every other day fasting failed to confer any neuroprotective or functional benefits to the injured mice whatsoever. How can we reconcile these apparently contradictory findings? Well, in the rats who experienced neuroprotection, fasting increased ketone production by 2 or 3 fold. The fasting mice never reached ketosis. Ketosis was key.

Alzheimer's disease: In a mouse model of Alzheimer's disease, both intermittent fasting and 40% (!) calorie restriction conferred cognitive and behavioral benefits when compared to mice on the control diet. IF and CR mice showed higher levels of exploratory behavior, and, when placed in a Morris water maze, found the escape platform sooner than the control mice. However, only IF mice showed evidence of protection against synaptic pathology – a hallmark of the disease.

Huntington's disease: Huntington's disease is also characterized by a depletion in BDNF levels. In a rat model of the disease, intermittent fasting normalized BDNF levels, while regular feeding kept them low. Fasting rats lived longer and even enjoyed better glucose tolerance than ad libitum fed rats. By all accounts, fasting slowed progression of Huntington's disease.

Age-Related Cognitive Decline: We've all had a grandmother who called us by our sibling's name, or a grandpa who forgot to unwrap the Wither's Original before popping it into his mouth – these are the innocent, simple, quaint, seemingly unavoidable declines in cognition that accompany the aging process. Well, maybe they aren't unavoidable. Although most of the research focuses on neurological trauma and disease, there's evidence that intermittent fasting is good for basic age-related cognitive decline. I find it interesting that this was "late-onset" intermittent fasting; meaning elderly rats who began fasting only after showing signs of decline still wrought cognitive benefits. Contrast that with the stroke study in which older rodents saw almost no benefit from fasting and a picture emerges: as long as they're not trying to counter a debilitating event, like ischemic stroke or trauma, older brains can also expect to benefit from fasting.

Depression: depression has long been associated with lower BDNF levels as a prognostic of the disease, but it's only recently that researchers are entertaining the possibility that low BDNF and depression could be causally related. And indeed – antidepressants actually increase BDNF signaling and synthesis in the hippocampus (the part of the brain where depression "happens"). Could fasting help with depression via up regulation of BDNF and promotion of neurogenesis? Perhaps. I'd say it's worth a shot, especially since skipping a few meals doesn't require a prescription.

Obviously, since these are mostly rodent studies, and hard-and-fast peer-reviewed evidence of the neuroprotective and neurogenerative effects of fasting in humans doesn't exist yet, we're only speculating. But I'd argue they are plausible speculations worth pursuing. The mechanisms are there. A speculation about IF's other health effects – to general health and cancer and longevity and fat loss – are being borne out by human research. Both the risk and barrier to entry are low. And it makes sense in light of our evolutionary history as hunter-gatherers. In a recent interview, Mattson even couches the neuroprotective effects of fasting in evolutionary terms, noting that during pre-agricultural times of scarcity, people "whose brains responded best – who remembered where promising sources could be found or recalled how to avoid predators — would have been the ones who got the food" and lived to pass on their genes.

The dreaded disease, multiple sclerosis:, has been treated successfully with fasting. Dr. Shelton states that "much progress may be expected in a great number" of late cases of this disease, even though recovery is not fully complete. Dr. Richard Geithner, of the Blaubeuren Sanatorium in Germany, reported that three multiple sclerosis patients "who agreed to the fasting-cure were free of paralysis after 18 to 21 days of fasting." One of these patients had a new episode of paralysis after the fast, which, in turn, was cured by another fast of 14 days. During the following three years of observation, there was no recurrence of paralysis. Dr. Alsaker stated that "It is a revelation to some persons who fast how clearly the mind can function." This being true, it might be expected that various forms of insanity would be helped by fasting. Widespread experience by many physicians has shown that fasting is not only valuable in caring for the insane patient but that it frequently succeeds where all other forms of treatment have failed. Fasting can not only be applied in promoting absorption of brain tumors and improving the physical condition of the brain and nervous system; it also has been used successfully in treating mental aberrations which were thought to have purely emotional causes.

Fasting and fertilization: For conception to occur the female must be producing viable eggs during her monthly cycle and the male's sperm must be strong and healthy in order to fertilize the egg during intercourse. Infertility, which is quite simply the inability to conceive, is becoming more common and this "natural and simple" journey can be a difficult challenge given all the contributing factors to fertility. Factors such as diet, exercise, weight, health conditions, stress levels, emotional and mental states, genetics and a high toxic load in the blood stream all play a major part in determining one's ability to conceive. There are many ways to treat infertility however some treatments can be extremely off putting, stressful and expensive. One of the quickest and most effective ways at getting both the male and female ready for conception is by doing a fasting detox. By undergoing a thorough cleanse the body has time to heal and regenerate itself on a cellular level. Fasting allows for all the toxins to be removed from the cells, hormones to be rebalanced, the liver to metabolize any excess hormones floating around the body such as xenoestrgens (found in chemicals, plastics and pesticides which create an imbalance in natural estrogen levels) and cortisol (stress hormone which can lead to inflammation, exhaustion, poor cellular function) which may be leading to infertility. Inflammation is decreased, all organs regenerated, blood sugars rebalanced, immune system boosted, nervous system rested and reproductive system balanced – amongst many other positive side effects – getting your body cleansed, detoxed, healthy and ready for fertility.

Effect of fasting on eye diseases: Prognosis in the case of many eye diseases is good if fasting is employed. Numerous cases of visual defects have been completely remedied by fasting, though some mechanical defects cannot be corrected of course, and certain eye ailments require aid which fasting cannot give. When the muscles of the eyes suffer from a lack of tone, strength, flexibility, suppleness and coordination, special eye exercises will give more benefit than fasting, though fasting may be used to supplement this treatment. Among the eye conditions for which fasting is often a specific remedy are cataract, congestion of the conjunctiva, catarrhal and granular conjunctivitis, glaucoma, iritis, keratitis and stye. Early cataract generally disappears on the fast; advanced cases may disappear, but recovery is much less certain. Dr. Shelton records one case in which blindness of one eye (due to cataract) completely disappeared on a fast of 18 days. Dr. Gerald Benesh reports equal success in treating a complete cataract, which yielded to a 21 day fast. The forms of conjunctivitis require only cleanliness and fasting for recovery, with short fasts in acute cases and long fasts in chronic cases. When glaucoma exists, the hardness of the eye tends to disappear, with the excessive fluid being absorbed, on fasts of two or three weeks in duration. In advanced cases, when complete atrophy is present, the prognosis

is not favorable, with blindness the usual result. Iritis, keratitis and stye need only fasting, cleanliness and rest, with recovery the general rule unless previous suppressive treatment leaves permanent damage to sight.

Fasting and transplantation: Transplant patients are at increased risk of adverse effects related to fasting due to their underlying illness and immunosuppressive medication. Prior to the commencement of Ramadan Muslim patients ask their doctors whether they can fast. The major concern in these patients is that if dehydration and accumulation of metabolites may result in irreversible deterioration in renal function or facilitate rejection episodes via inducing changes in immune system. One study did not find any change in circulating immune complexes during Ramadan fasting in the normal population, and another reported a decrease in complement C3 levels and an increase in C4 levels in renal transplant recipients.

With increasing the number of renal transplants performed in Islamic countries as well as improved quality of life, the question of the safety of fasting Ramadan is asked more often. Several investigations have addressed this issue and found no significant adverse effects of Ramadan fasting on transplant patients or allografts; Argani studied 24 patients and found no significant increase in body weight, blood pressure, 24-hour urine volume, protein to urine creatinine ratio or blood urea nitrogen. In addition, T-cell and white cell counts, hemoglobin levels, and low density lipoprotein did not change significantly after completion of 30 days of Ramadan fasting. B cells counts, serum IgM concentration, serum C 3 levels, and serum very-low-density lipoproteins value all significantly decreased after fasting compared to pre-fast period. Higher levels of high density lipoprotein and serum C4 values were also observed after Ramadan fasting. The authors finally concluded that Ramadan fasting was not harmful to stable renal transplant patients with a 12-hour fasting pattern. However, they proposed that patients should be observed carefully by their physicians while fasting.

CONCLUSION:

A wonderful thing about fasting is that it puts an interval between the behavior that you are accustomed to and the behavior that you aspire to. We tend to be creatures of habit, and the ways that we are accustomed to eating and living feel as natural to us as breathing. That is why it is so difficult for people to stop bad habits. But fasting brings your present lifestyle to an abrupt halt. It gives you an opportunity to pause, reflect and decide how you are going to conduct your life afterwards. This enables you to make a break with your past and set off in a new, more positive direction.

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