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Kakachanchuvadasyena pibedyayum shanaih shanaih!

Kaki mudra bhavedesha sarva rog vinashinill G.3/66

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Drink Air, Stay Fit

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Preamble

Yoga is increasing in popularity by leaps and bounds. Some proponents claim it to be the panacea of cures for every disease from amoebiasis to Alzheimer's disease and from coronary artery disease to cancers.

Still, since yoga has been brought to us through the television channels, for most of us yoga means performing a few asanas and a few pranayamas. The internal cleansing procedures in yoga exemplified by *vata-sara* have been largely ignored, both due to their complexity and due to lack of medical knowledge in the yoga gurus. Yoga gurus have been scratching their heads to arrive at the correct meaning of the ancient 12-step *Suryanamaskara* (Sun salutation), which has been debated for long.

Air is present in the human gut almost universally. Yet, medical books by and large have ignored its importance. The possible areas of interest being-

1. Obesity (with its resultant problems diabetes mellitus, hypertension and atherosclerosis) and 2. Various gastrointestinal disorders- are two of the major health concerns today, and the author begs to point out that air drinking can be useful in both.

The present work attempts to see relevance in the ancient yogic practice of *Suryanamaskara*. In the author's view, it is a manoeuvre to fill the intestines with air.

Further, filling of the intestines with air makes swimming much more easy and efficient, so much so that it is only on reading this book and practicing accordingly that swimmers will realize what they were missing till now.

The air taken-in by drinking passes down the gut and is ultimately passed out as flatus. (If someone is afraid of flatulence, my recommended reading is the collection of essays '*Fart Proudly- writings by Benjamin Franklin you never read in school*' edited by Carl Japikse)

CONTENTS

CHAPTER 1.OBESITY

- 1.1. Introduction
- 1.2. Causes of obesity
 - 1.2.2. The cause of ‘Simple Obesity’
 - 1.2.3. Regulation of body weight
 - 1.2.3.1. Ghrelin
 - 1.2.3.2. GLP-1
 - 1.2.3.3. Other neurotransmitters
 - 1.2.4. Determinants of body weight
- 1.3. Clinical features
- 1.4. Complications of obesity
 - 1.4.1. Mortality and morbidity
 - 1.4.2. Psychological effects
 - 1.4.3. Osteoarthritis of knees
 - 1.4.4. Varicose veins
 - 1.4.5. Hypertension
 - 1.4.6. Hiatus hernia
 - 1.4.7. Breathlessness
 - 1.4.8. Sleep apnoea
 - 1.4.9. Coronary heart disease
 - 1.4.10. Gallstones
 - 1.4.11. Transient ischemic attacks and strokes
 - 1.4.12. Post-operative complications
 - 1.4.13. Diabetes mellitus
 - 1.4.14. Back Problems

- 1.4.15. Infertility and menstrual irregularities
- 1.4.16. Proneness to accidents
- 1.5. Management of Obesity
 - 1.5.1. Dietary control
 - 1.5.2. Yogic management
 - 1.5.3. Behavioral modification
 - 1.5.4. Drug therapy
 - 1.5.5. Surgical management
- 1.6. Prevention of obesity
- 1.7. References

CHAPTER 2. COMMON DISORDERS OF THE GASTROINTESTINAL SYSTEM

- 2.1. Introduction
- 2.2. The normal gut flora.
- 2.3. Helicobacter infections
 - 2.3.1. Air in the fundus inhibits *H.pylori* !
 - 2.3.2. Aerophagy is immunological !
 - 2.3.3. Hiccups are the body's effort to suck air in to the stomach!
- 2.4. Amoebiasis, Acute and Chronic
- 2.5. Therapeutic effects of Sigmoidoscopy
- 2.6. References

CHAPTER 3. THE SURYANAMASKARA

Series of manoeuvres to fill the intestines with air

- 3.1. What is *Suryanamaskara*?

- 3.2. The classical basis of *Suryanamaskara*
- 3.3. *Vata-sara*
- 3.4. The Revelation!
- 3.5. Effects of filling of intestines with air
- 3.6. The *Kaki-mudra*
- 3.7. Experiment 1
- 3.8. Experiment 2
- 3.9. The *Manduki Mudra*
- 3.10. *Suryanamaskara as air filling manouvre*
- 3.11 Step wise systematic description
- 3.12. Benefits of *air filling with Suryanamaskara*
- 3.13. Impact on swimming competitions
- 3.14. References

CHAPTER 4. OTHER METHODS TO FILL THE INTESTINES WITH AIR:

- 4.1. Simple two-step technique
- 4.2. The simplest “punctured straw” technique
 - 4.2.1. Practice
 - 4.2.2. The technique

Obesity

While on this earth millions of people are starving about 20% of the population is suffering from obesity. This has become a global epidemic. The hazards of obesity are well known. Every newspaper and magazine carries articles on obesity. It is the forerunner of insulin resistance and diabetes mellitus, and is commonly associated with hypercholesterolemia, coronary heart disease, gallstone disease and osteoarthritis of the knees.

Sleep apnea is another complication in which the affected individual suffers from obstruction to the airway in the throat with resultant interruptions in the nightly sleep. So much can be the disturbance that the individual feels drowsy in the daytime. Such patients are required to sleep with a machine which runs on electricity and provides respiration through mask attached to their mouth and nose when respiratory obstruction develops. So now we have to depend on machines even for breathing during sleep!

After all what is the treatment for obesity? Several medicines have been marketed in the last decade and people used them, but then how long can one go on taking medicines? Then there is fear of adverse effects. It also imposes an economic burden on the individual.

The most commonly suggested way is to eat less and burn more calories by exercise. Is this the only way available or is there an easy option in yoga? In the ancient Indian scripture *Rigveda* there is a mention that in the ancient times the *rishis* and *munis* used to eat air.

मुनयः वातरशनाः पिशांगा वसते मला । (केशी सूक्त, ऋग्वेद, 10,136,2)
'*Munis* eat air, wear cloths of varied colours and stay dusty..'(*Keshi Sukta, Rigveda,10,136,2.*)

Is it possible that we eat less and still feel satiated? How did the *munis* stay comfortable without eating for days at a stretch?

CHAPTER - 1

OBESITY

1.1. INTRODUCTION.

Obesity is acquiring proportions like a global epidemic. Not only the developed countries but also the developing ones are all facing this problem. Obesity is associated with shortening of life span and complications which make life difficult for the individual. In view of this, its prevention, rather than cure must be considered with utmost priority by health authorities the world over.

1.2.1. CAUSES OF OBESITY:

Obesity can occur as a part of a wider systemic disorder, the list of which includes-

- (a) Genetic Syndromes: There are some well recognized syndromes which are known by the names of their inventors, such as the 'Prader-Willi Syndrome' (PWS)¹, where there is deletion of some genes on the 15th chromosome or, in some cases, both the chromosomes of the 15th pair are acquired from mother only, the 'Laurence-Moon-Biedl syndrome' etc. Now-a-days great efforts are being done by researchers to precisely identify and locate the defective gene. Much success has already been achieved.
- (b) Endocrine disorders: Hypothyroidism, Cushing's disease
- (c) Hypothalamic lesions: Damage to a certain part of the brain called the hypothalamus-which regulates appetite and feeding behavior and body weight-is rarely ever a cause of obesity.

All the above systemic disorders collectively make up less than 5% of the obese population. The rest 95% are people who suffer from what is known as ‘Simple obesity’. They have no genetic or hormonal abnormality. Their obesity simply results from an imbalance between intake and consumption of calories, or a slight disturbance of appetite and body weight regulation.

It is also of interest that obesity is largely restricted to humans and animals which are domesticated or live in a zoo.

1.2.2. What is the cause of ‘Simple Obesity’

Fat is stored by the organisms to be used as a source of energy in times of food scarcity. Hibernating animals store fat before going in to hibernation and use this body fat as a fuel during the cold months. They emerge lean and thin. Non-hibernating animals in most cases, maintain a constant body weight despite cyclic changes in the availability of food. Several studies have been conducted to find out why obesity occurs.

Twin studies² have been done to find out importance of genetic and environmental influences.

Experimental studies (in animals): In 1994 a naturally occurring mutant obese mouse was discovered.³ It was seen to have ob/ob genes. The product of the ob gene is a 16 kda protein (Hormone) called the leptin. The ob/ob mice were found to be deficient in leptin. Injection of leptin in these mice produced satiety and reduced weight. For this reason leptin was also called the body’s lipostat. Many hopes were pinned on leptin as a possible therapy for obesity. However, normal animals as well as humans can not be equated with the genetic ob/ob mice. In normal human subjects the leptin

production is proportionate to the amount of adipose tissue present in the body. In obese individuals the leptin levels in blood plasma are already high⁴. For this reason the possibility of leptin deficiency being a cause of common human obesity and leptin being used as an anti-obesity agent have become remote. While leptin functions to maintain the mass of adipose tissue constant, it does not terminate an individual meal on its own. It is thought that it modifies the response to other chemicals e.g. the satiety peptides.

As is obvious, in obese individuals the large amount of fat stored in the adipose tissue, which can serve as a source of energy, does not suppress the desire to eat the daily amount of food. When a person becomes obese, despite the high levels of leptin the appetite continues to be vigorous. Still, rather than giving up on the leptin theory and finding some other chemical (Or its lack) responsible for obesity, some authors started viewing obesity as a case of leptin resistance.

1.2.3.Regulation of body weight:

A part of the brain known as the hypothalamus is involved in regulation of body weight, both in the short and the long run.

Certain areas of the brain-called the hypothalamic ventromedial, dorsomedial, paraventricular and arcuate nuclei are involved in appetite regulation. They are shown to have receptors for leptin. The hypothalamic and other brain areas receive signals from the olfactory and taste receptors as well as from the oral mucous membrane, the jaw and muscles of mastication. These impulses reach the brain via the different cranial nerves, the olfactory, lingual, trigeminal, glossopharyngeal and the vagus. The importance of the filling of the stomach was clearly demonstrated in the earliest

experiments which showed that dogs continue to eat endlessly if the food that they swallow is not allowed to reach the stomach. (Sham feeding)⁵

1.2.3.1. Ghrelin:

The gastro-intestinal tract is actively involved in the regulation of meal size. Hunger has been shown to be proportionate to the strength of contraction of stomach as early as about a century ago by Cannon⁵, who also gave us the term ‘hunger pangs’. Now it is well established that the stomach secretes a peptide called ‘ghrelin’ in the fasting state. Injected ghrelin causes hunger. In the filled state of the stomach the stretch receptors get activated and give rise to a sensation of satiety. Also, intake of food inhibits the release of ghrelin. It is this mechanism that is somewhat defective in persons who develop obesity. In obese individuals food fails to suppress ghrelin secretion⁶. Sensation of the stomach being full or empty is carried to the brain via the two vagi. (singular-vagus).

1.2.3.2. Satiety peptides:

After food reaches the intestines, the intestinal mucosa senses its calorie content and in response it secretes several chemicals such as cholecystokinin (CCK), oxyntomodulin and peptide tyrosine-tyrosine (PYY), bombesin, glucagon-like-peptide-1 (GLP1), enterostatin and somatostatin. When injected, several of them are able to induce satiety and reduce food intake. Together they have come to be known as ‘satiety peptides’ Most of them act on the afferent nerve fibers contained in the vagi, but some also reach the brain via the blood circulation and act on the hypothalamus directly. Some of these also cause secretion of insulin, they are termed ‘incretins’.

1.2.3.2.1. GLP-1.

GLP-1 which is a member of the pancreatic polypeptide group has occupied a special position. It is secreted by the enteroendocrine L cells of the small intestine. Physiologically it regulates appetite and is a stimulus for the secretion of Insulin. Orally given glucose releases GLP-1, while intravenous glucose does not. It has been shown that in obese persons the GLP-1 secretion in response to a meal is less than in a normal-weight individual⁷. GLP-1 has a very short plasma half life, being quickly excreted by the kidney and degraded by the enzyme dipeptidylpeptidase-IV. For the purpose of study, it has to be administered by continuous intravenous infusion. Infusion of GLP-1 produces satiety, reduces food intake, increases insulin secretion and in the long run, reduces body weight. In animals it has been shown to promote regeneration of pancreatic β cells- the cells responsible for insulin secretion. A drug, exenatide⁸, a GLP-1 receptor agonist has been developed and is used in type-2 diabetes patients. It has been approved by the US-FDA. It has a longer plasma half - life and can be given subcutaneously. It causes early satiation and reduces food intake, reduces body weight, but also can cause nausea and sometimes a 'feeling of illness'.

1.2.3.3. Other neurotransmitters:

Hypothalamus is also acted upon by several other chemicals such as adrenaline, dopamine, 5Hydroxytryptamine (5-HT), and some cellular messengers called cytokines such as interleukin-1 (IL-1), tumour necrosis factor (TNF) and endocannabinoides. Efforts have been made to develop drugs based on these chemicals, such as sibutramine which is a 5HT agonist. Recently, a cannabinoid receptor-1(CB-1) inverse agonist Rimonabant⁹

has been approved in India and awaits approval by the US-FDA. The clinical results on wider use remain to be seen. Over all, so far the drug treatment remains far from ideal.

The gastrointestinal regulation of food intake has been extensively reviewed by David E. Cummings and Joost Overduin¹⁰. However, in the author's opinion the commonly held view that 'gastric satiation is volumetric, intestinal satiation is nutritive' endorsed by them is seriously challengeable because of the following:

1. Intestinal distension has not been investigated by any researcher, probably because of the obvious difficulty involved in introducing a balloon in the whole length of the intestines.
2. The role of CCK has been only partially investigated. We must not forget its earliest known function, contraction of the gall bladder. Parenterally administered CCK contracts the gall bladder and the resultant outpouring of cholesterol-rich bile in the duodenum may itself contribute to the satiety.
3. While studying intraduodenal perfusion, corn oil has been used¹⁰. Intraduodenal (ID) perfusion of cholesterol has not been studied. Vegetable oils do not contain cholesterol.

Recent evidence points to the fact that the cholesterol that is synthesized in the liver and secreted in the bile has several functions in the gut^{11,12}. In the author's opinion it is possible that pouring of cholesterol-rich bile into the intestinal lumen due to gall bladder contraction contributes to satiety. It remains to be seen whether intestinal distension by air releases GLP-1. Going by personal experience, air-filling manoeuvres do lead to a temporary satiety, which may be mediated by GLP-1.

1.2.4. Determinants of body weight:

The body weight is a result of interplay between two opposing factors, the food intake and the energy expenditure, which themselves depend upon various other influences as under:

Factors affecting Food Intake	Factors affecting Energy expenditure
Company	BMR
Type of food	Weather
Surroundings	Ambient temperature
Habits	Physical activity
Social pressures	Thyroid status

In a lean individual, it is difficult to increase weight. A force-feeding usually leads to production of more body heat (thermogenesis) mediated by a modified thyroid hormone – the “reverse T_3 ”. Brown Adipose Tissue (BAT) consumes fuel and releases heat, thus helping maintaining normal body weight. A prolonged increased intake of food- which provides a small surplus of calories- in the long run leads to significant weight gain. Once gained, the weight becomes hard to lose- as homoeostatic mechanisms try to maintain it at the new level.

The obese persons often ask: Why are certain persons lucky who can eat as much as they feel like and still stay lean, while we can not? In other words, with as much food as is required to maintain our body weight constant, why do we not feel satiated?

This brings us to the basic question of satiety. Viewed thus, obesity is a disorder of satiety. Type 2 diabetes mellitus most commonly develops in obese individuals and therefore should be considered an extension of the same process. This fits well with the observation that in obese individuals the

food fails to suppress ghrelin secretion and also the secretion of GLP-1 is lesser. This also makes GLP-1 or an analogous drug a rational choice for the treatment of obesity as well as type 2 diabetes in an obese individual.

1.3. CLINICAL FEATURES:

Obesity can be judged more by appearances and by skin fold thickness than the standard height/weight charts. In adult-onset obesity, without going in for the complicated techniques, one may assume that any weight gained after the growing age (Males 24, females 20) is due to fat only.

Scientifically, we speak of the body mass index (BMI) which can be calculated from the body weight and height of the individual.

$$\text{Body -Mass Index} = \frac{\text{Body Weight in KG}}{\text{Height in meters squared}}$$

Body-mass index of 18 is probably ideal, below which an individual may be called as underweight. 18-25 is the normal range, above 25 one is labeled as overweight, while very obese persons may have BMI of about 40 ! However, as has been pointed out by some authors, the body mass index does not take into account the relative proportion of muscle and fat.

1.4. COMPLICATIONS OF OBESITY:

Every one of us must become aware of the ill effects of obesity. In fact the common usage of the term “healthy” applied to overweight individuals should be discouraged.

1.4.1. Mortality and morbidity

A 10% overweight person has a 13% greater chance of death; while a 20% overweight has 25% greater chance. There is definite increase in morbidity due to diabetes mellitus, hypertension, IHD and strokes.

1.4.2. Psychological effects:

Overweight individuals are pre-occupied for their overweight status. Many a times they are made jokes of and sometimes they become the victims of self-deprecation and psychological depression.

1.4.3. Osteoarthritis of knees: In almost any obese individual some degree of osteoarthritis of the knees is inevitable. So that they develop pain in knees by the age of 55 and walk with a waddling gait.

1.4.4. Varicose veins: Tortuous veins in the legs result from damage to their valves, they become painful as more and more valves get damaged.

1.4.5. Hypertension or high blood pressure, with all its attendant dangers is directly related with obesity and it has been documented that a weight reduction brings the blood pressure down without the use of drugs.

1.4.6. Hiatus hernia: A large accumulation of fat in the abdominal cavity pushes the uppermost part of stomach into the thorax through the diaphragmatic aperture. This can lead to symptoms such as heartburn and sour regurgitation.

1.4.7. Breathlessness: An average obese individual is all the time carrying an extra load of fat of about 15-20 kg. For this reason alone one can become breathless while climbing up stairs. However, this is not all. The extra fat has its own blood supply and in this way puts some demand on the heart. There is an associated increase in blood pressure. All these factors may lead to a mild heart failure; which also may contribute to the breathlessness experienced by obese individuals. Weight reduction reduces the symptoms.

1.4.8. Sleep Apnea: A grossly obese individual who has about 20 kg extra fat in the body has about 300-400g

extra fat in the tissues of the throat and back of tongue. Snoring is a common problem. In these individuals; when they sleep, the tongue falls back and closes the throat resulting in a choking sensation which awakens the patient from sleep. There are almost 20-50 awakenings per night with the result that the individual becomes sleep-deprived and feels drowsy in the daytime. In the past decade “CPAP therapy” has been developed for such sufferers: It is given using an electrically operated machine which delivers positive pressure breathing through a tube and mask fitted over the nose and mouth. The person has to sleep with the gadget put on and tied securely to the head. It is an irony that our breathing needs to be assisted by machines now!

1.4.9. Coronary Heart Disease : Both sudden deaths and clinically documented heart attacks are more common in obese people, especially males, while females suffer from-

1.4.10 Gallstones They can be found in any fat female of forty on ultrasonography. In some they cause symptoms such as pain in abdomen, known as biliary colic. Many need laparoscopic surgery for removal of gall bladder.

1.4.11. Transient Ischemic attacks and strokes : Occur due to deposition of cholesterol-rich material in the inner lining of the arteries of the brain. Eventually some day such a partially closed artery gets completely obliterated and gives rise to a stroke. It can take several forms, the most common being a paralysis of half of the body (hemiplegia)

1.4.12. Post-operative complications: Surgeons always fear operating upon the obese individuals. They may suffer increased incidence of post-operative complication such as thrombo-embolic phenomena etc.

1.4.13. Diabetes Mellitus : (NIDDM, Non-insulin dependent diabetes mellitus): It is not unusual to see an obese person become a diabetic. To some extent obesity is

always associated with insulin resistance- a lack of effectiveness of insulin, the blood sugar lowering hormone. Viewed thus, obesity can be considered a forerunner of NIDDM.

1.4.14.Back Problems : Since the enlarged, protuberant abdomen changes the way a person stands, it deforms the backbone and leads to what is known as spondylolisthesis. Once acquired, the wrong posture can not be corrected unless one gets rid of excess of the excess body fat.

1.4.15.Infertility and Menstrual Irregularities are quite common in obese women .

1.4.16.Proneness to accidents : Obese persons can not balance their weight and often fall down in doing normal routine activities. Often it leads to fractures.

1.5.MANAGEMENT OF OBESITY

1.5.1.Dietary control :

This is probably the only way available to reduce body weight in obese persons. If we take into account the daily calorie consumption as around 2200-2400 Calories and the fact that 1G of fat produces 9 Calories then it can be calculated that a totally fasting individual will lose about 250 G weight per day. Sometimes when one begins dieting the initial weight loss is much more than this. It is due to the loss of water and electrolytes and which is soon regained once normal diet is resumed.

If not totally fasting, one must reduce the total calorie content of the food without compromising with the daily intake of vitamins, electrolytes and water. Crash dieting can reduce weight quickly, but one must take care not to regain the lost weight equally fast.

comfortably for several hours without eating.

1.5.3. Behavioral modification :

1. Eatables should not be perceived as rewards for having done a day's hard work.

2. Some creative activity should always form a part of the daily schedule in order to keep oneself busy.

3. One must use one's own discretion and experience rather than other's advice on how much to eat.

4. While eating fatty foods, it should be remembered that they bring satiety with some delay.

1.5.4. Drug therapy

Various appetite suppressants have been tried. Fenfluramine is a central noradrenergic drug, now discontinued because of adverse effects. Sibutramine, a central 5HT agonist is currently in wide use. The intestinally acting lipase inhibitor orlistat and cannabinoid receptor antagonist rimonabant are other available drugs. All have been shown to be effective in weight reduction as long as continued, however, none fulfills the requirement of re-setting the lipostat of the body so that one could remain lean even after discontinuing the drug. Adrenergic β_3 agonists which stimulate the BAT have also been studied, though no drug of this class has yet been marketed. GLP-1 analog Exenatide has shown promising results in obese diabetics.

1.5.5. Surgical management :

It is interesting to note what drastic measures have been developed by surgeons to reduce food intake! Some examples are as under :

Wiring the jaws

Gastroplasty

Gastric Banding

Gastric Bypass

Liposuction

Some of the surgical procedures aim at a false satiety by causing stimulation of the stretch receptors in the stomach. When they reduce the size of the stomach small amount of food is sufficient to stimulate the receptors. However, it must be remembered that reduced food intake after surgical procedures or even appetite suppressants may produce the same sensation of general weakness and fatigue as occurs after having taken reduced diet.

1.6. PREVENTION OF OBESITY :

Preventing obesity must always be the priority because obese people find it difficult to maintain any weight loss that they have achieved. All children as well as young and old adults should be motivated to reduce and maintain normal weight.

Despite all arguments an individual is definitely responsible for not maintaining normal body weight. If one weighs oneself regularly any increase in body weight should be immediately obvious when it is of the grade of 1-2 kg. At this stage it is possible and easier to take corrective measures.

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CHAPTER - 2

COMMON DISORDERS OF THE GASTROINTESTINAL SYSTEM

2.1. INTRODUCTION

Gastro intestinal disorders like indigestion, nausea, vomiting, loose motions etc. are common in the population. Most often these are suspected to be due to bacterial, giardial or amoebic infections, are short-lived and subside by taking some medicines such as antacids, antibiotics and antiamoebics, all of which are easily available in India with or without prescription. The fact that these drugs apparently cure the problems is taken as a further proof of the cause i.e., the various infections.

2.2. THE NORMAL GUT FLORA

The gastrointestinal tract of normal humans as well as thousands of other species harbors hundreds of kinds of microorganisms including aerobic and anaerobic bacteria, amoebae and certain fungi.

The intestines have learnt to live with these microorganisms through millions of years of coexistence. Both derive benefit from each other. While the organisms survive and multiply in the gut, they get everything they need there: nutrition, water, optimum temperature etc. In exchange they synthesize certain vitamin B-complex factors and vitamin K useful to the host. In addition, by their presence they inhibit other disease-producing organisms from invading the gut. They also stimulate immunity and development of lymphoid tissue. Most of the individuals remain symptom free with their presence, but in some individuals they can cause disease.

Who will harbor what kind of microorganisms in the

gut largely depends upon the host species; and in humans, upon the race, genetics, age, sex, and diet of the individual⁴.

It also must depend upon the aeration (capability and habit of circulating air) through the gut, though this aspect has largely been ignored by the scientific community- clinicians and physiologists alike. When atmospheric air freely flows across the gut- being ingested through the mouth and expelled through the lower passage, most anaerobic organisms must get inhibited. That also explains why in healthy humans the *Entamoeba histolytica* are excreted as cysts. (80% of the population are ‘cyst-passers’) So far no studies have been performed to find out the effect of drinking carbonated beverages which must also have a modifying effect on the gut flora, theoretically, promoting growth of anaerobic organisms.

The part of the gut known as the appendix, being a closed-ended tube, remains free of air circulation and can provide a niche for the anaerobic organisms. In ruminating mammals the appendix is very large and in that proportion harbors a much larger population of anaerobic organisms.

2.2.1 Gut flora and obesity

It is well known that some GIT micro flora produce gases. There are several individuals who complain of gas formation in the abdomen. **It is possible that the production of gases is beneficial in some way as gaseous distension of the gut may contribute to satiety.**

In some studies clearly distinct types of bacterial flora have been detected in obese and non-obese humans as well as in mice^{1,2,3}. The differences have been thought to be a *result* rather than the *cause* of obesity. This is so because experiments have been done on the genetically obese ob/ob

mice. The application of results of mice experiments to human beings is again questionable because ob/ob mice are not parallel to obese humans, who have normal ob/ob genes and an excess of leptin rather than a deficiency. In the author's opinion it is obesity that should be thought of as a *result* of altered GIT flora. The so-called fattening foods may be having their effect through modifying the gut flora. If we think in these terms, treatment of obesity may not be far away. Only we have to identify the correct type of flora, cultivate them, and make them into capsules to market. Alternatively, we can select the foods or food supplements that stimulate the growth of such flora, and also choose between the aerobic or anaerobic environment in the gut, by resorting to air-filling manouvers.

2.3. HELICOBACTER INFECTIONS

Peptic ulcer and non-ulcer-dyspepsia:

The two most important causes for the formation of peptic ulcers are 1. The drugs called non-steroidal anti-inflammatory drugs (NSAIDS) and 2. The gram-negative, motile bacterial organism *Helicobacter pylori*^{5,6,7}. As we know the infection with the bacterium *H. Pylori* is acquired in early childhood, by oral-oral or feco-oral routes. Unhealthy food handlers, houseflies and sewage contamination of drinking water may all contribute to the spread of infection. The bacterium settles down in the pyloric mucosa. It produces an enzyme urease with which it splits urea into ammonia and in this way creates an alkaline surrounding which allows it to live in the highly acidic environment. (Nobel Prize for Medicine for the year 2005 was awarded on the discovery of this organism). Once acquired, the infection can persist for long, even for decades. In the majority of cases it produces no symptoms, but those

who suffer from non-ulcer dyspepsia will not get cured unless the infection is treated.

H.pylori infection is known to cause non-ulcer dyspepsia and peptic ulcers. It is possible that if an asymptomatic individual harbouring *H.pylori*, takes a drug of the non-steroidal antiinflammatory drug (NSAID) group, the drug may start the process of ulcer formation causing an erosion by inhibiting the protective prostaglandin PGE₂, superadded on which the organisms, already present around, settle down and do not allow quick healing.

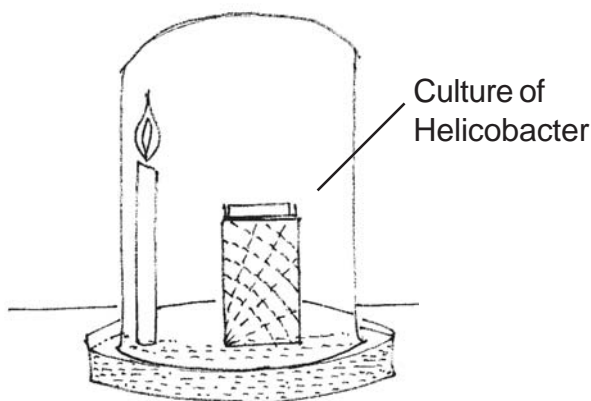
In a normal individual antibodies develop against *H.pylori* and are detectable in the serum. This forms the basis of serodiagnosis of *H.pylori* infection. These antibodies, however, are not able to eliminate the infection. Sometimes there is production of immunity against the gastric mucosa leading to atrophic gastritis, and even gastric cancer can follow.

In our clinical practice we have observed that those individuals who, after getting infected with *H.pylori* develop symptoms of either ulcer or non-ulcer dyspepsia keep on taking a daily dose of some acid-inhibiting drug such as omeprazol. In India where omeprazol and other drugs of this kind are sold over-the-counter it is not unusual to find a person taking such a drug for several years.

H.pylori infection can be treated easily using a combination of antibiotics for two weeks with permanent resolution of the symptoms. However, contrary to experience elsewhere⁷, in India it is a common observation that living in the same environment, drinking the same water and eating at the same outlets the infection is easily re-acquired and again has to be treated with a combination of antibiotics. This way we end up with repeated courses of anti-*H.pylori* drugs taken

by patients often without a repeat prescription and problems of drug resistance may come up⁸.

H.pylori is microaerophilic i.e., it grows best in absence of oxygen and can be grown in a school laboratory in an inverted bell jar under which a candle has been lit. The candle consumes all the oxygen present inside the bell-jar and releases carbon-dioxide which favours the growth of the organism. Even in the laboratory setting, if one is to remove the bell jar everyday for just five minutes and replace it after again lighting the candle, the growth of the organism will be seriously impaired.



2.31 Air in the fundus inhibits *H.pylori* !

The organism *H.pylori* colonizes the pyloric region of the stomach. It does not colonize the fundus of the stomach, but so far scientists have not found an explanation for this. In the author's opinion the cause for this appears to be the fact that the fundus of the stomach often contains an air bubble which must be responsible for inhibiting its colonization there⁹.



This is a startling fact which, quite surprisingly, has escaped attention.

2.3.2. Aerophagy is immunological! :

Aerophagy has been classically considered to be a manifestation of anxiety- “Anxious individuals swallow more air and the pass it out in repeated belchings.¹⁰” Now-a-days after the discovery of the organism *H. pylori* it is commonly considered as a symptom of *H.pylori* infection. However, in the author's opinion it seems to be an effort of the immune system to inhibit anaerobic organisms like the *H.pylori* by

sucking in air into the stomach. As pointed out earlier, the upright posture of the human beings is a deterrant because of which the ingested air is not able to reach the pyloric region and this effort of the immune system is not able to eradicate the organism *H.pylori*; without changing posture.

In this regard it is worth mentioning that while some other manifestations of disease such as fever and diarrhoea are recognised as immunological; it should also be recognised that aerophagy is immunological and if there is a patient having aerophagy, the doctor should aim at treating anaerobic infection in him.

2.3.3. Hiccups are meant to suck air in the stomach!

For centuries physiologists have been striving to find the purpose of hiccups. Its purpose so far has been unclear and some doubt whether it does have any purpose. Just look at the sequence of events that take place in a hiccup: it is clear that there is a sudden contraction of the diaphragm coupled with closure of larynx by adduction of the vocal cords. Although it has been said that ‘The sudden rush of air into the lungs causes the epiglottis to close, creating the “hic”¹¹’ this is a totally unscientific statement and quite easy to disprove, as anyone can draw in air as fast as one can without the glottis getting closed. (In fact the pulmonary function test -spirometry- involves estimating peak inspiratory flow rates. During spirometry the candidate is asked to inspire as fast as possible, and yet no closure of the glottis is observed.) The vocal cords are innervated by laryngeal nerves, branches of Vagi, and are under tight control of the medulla oblongata. Hence the adduction of the vocal cords observed during hiccups is definitely an active process and not just a passive closure. The contraction of diaphragm coupled with closure of the larynx clearly appears to be designed to direct the flow of air in to the esophagus.

If due to any reason the gullet (upper end of the esophagus) is not able to open, the purpose of hiccup is not served and the process keeps repeating. Prolonged hiccups may become a source of substantial trouble to the sufferer. No wonder that a large number of remedies have been advised, most of them through personal experiences and anecdotal evidences but none with a scientific basis.

In the author's opinion, allowing air to be sucked in by *kaki mudra* is the only scientific remedy for hiccups. If not able to perform, one should try the other methods given in the fourth chapter of this book, especially the punctured-straw technique.

2.3.4. Yogic treatment of helicobacter infection

If by some means we could move the air bubble to the pyloric region it would be possible to combat the H. pylori infection without drugs.

In yoga, this can be achieved through a two-step procedure, performing *Kaki-mudra* to introduce a big a bubble into the stomach first and then performing any of the *asanas* which invert the trunk such as the *sarvangasana*, *full or partial shirshasana* or even *hastapadasana* to move this air bubble to the pyloric region. Even a few minutes' exposure of the antral or pyloric mucosa to air everyday may help eradicating the infection and bring about healing in peptic ulcer. Although this is just a hypothesis and needs to be tried out, there are reasons to believe that it can be proved.



Air bubble moves to the pyloric region in the inverted yogic posture (*Sarvangasana*)

2.4. AMOEBIASIS, ACUTE AND CHRONIC:

Amoeba, technically known as the *Entamoeba histolytica* is an obligate anaerobe; which means that in presence of oxygen it cannot stay in its active, vegetative form and has to coil into a cyst. Cysts of amoebae are commonly found in the stool samples of normal, asymptomatic people. It must be because most of us keep ingesting air which is passed down to the colon where the amoebae reside. Thus they are forced to get converted into cysts. This way we stay free of invasive amoebiasis.

2.5. THERAPEUTIC EFFECTS OF SIGMOIDOSCOPY:

A placebo effect or therapeutic effect of insufflated air ??

Sigmoidoscopy is an investigative procedure; usually

performed using a rigid sigmoidoscope which is a tube-like instrument, 30 centimeters long and with 2 cm diameter. The patient is made to sit in the knee-chest position and the instrument is inserted into the anus after due lubrication. With this, the lowermost part of the gastrointestinal tract—the sigmoid colon and the rectum is visualized directly. As a part of the procedure, some air is used to inflate the sigmoid colon to aid in visualization and make advancement of the instrument easier. Everyday hundreds of patients in different parts of the world undergo sigmoidoscopy in the hands of gastroenterologists.

It is a common experience of a number of gastroenterologists that the patients often report a marked improvement in their symptoms of ‘frequent bowel habit’ and ‘mucus formation’ after the procedure; and this beneficial effect lasts several days to months. As doctors discussing in our close circles we have often made fun of such patients. How a procedure designed for diagnosis of an ailment can prove therapeutically beneficial! – We have wondered. Most of us have attributed any improvement in the patient’s symptoms which he attributes to sigmoidoscopy to a placebo effect (psychologically generated beneficial effect). **However, such a view is seriously challengeable and there is no evidence that improvement in patient’s symptoms that occurs after a sigmoidoscopy is due to placebo effect.** On the other hand, it is quite obvious that the insufflation of air is capable of inhibiting anaerobic organisms, especially the *Entamoeba histolytica*. It is going to be a difficult task to either prove or disprove this, as, then one one would have to perform sigmoidoscopy using nitrogen for insufflation and even then it may not be possible to prevent atmospheric air from entering the rectum once a patient is

made to sit in that particular posture.

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What is *Suryanamaskara*

Let us first see the form of *Suryanamaskara* we have been handed down. *Suryanamaskara* is a 12-step series of bodily postures which millions of yoga aspirants follow as a daily routine. Yoga *gurus* describe it as a form of physical exercise which keeps both the body and the mind healthy and fit. It has been interpreted as a kind of aerobic exercise- nothing beyond this. But *gurus* have no explanation why the 12 steps are to be performed in a specific order, apart from that traditionally it has been taught like this.

What is new

The addition of *Kaki Mudra* at step 2,4,7,9 and 11 (all postures where the trunk is upright) gives the entire process a very different meaning. Viewed this way, the *Suryanamaskara* becomes a way to fill the intestines with air, and this seems to be the initial purpose with which the 12-step procedure must have been designed. Since the existing form of *Suryanamaskara* has received global publicity, I have to use the adjective '*pawahari*'; otherwise, my contention is that *Pawahari Suryanamaskara* is the real *Suryanamaskara*.

The most important thing here is, *pawahar*- which means eating air. Without it the whole process of 12 bodily postures is nearly meaningless.

CHAPTER - 3

THE SURYANAMASKARA :

Series of manoeuvres to fill the intestines with air

3.1.WHAT IS SURYANAMASKARA?

We have all heard or read about *Suryanamaskara* (Sun salutation). It is taught on the TV by yoga gurus, described in books and magazines and is available on the internet¹.

Suryanamaskara is a series of 12 postures that is performed as a daily routine by thousands of people especially in India. It is an ancient form of exercise which has been handed over down the generations. I had learnt it from my father in my childhood.

In the first edition of my book ‘Yoga Book for Doctors’ I had described *Suryanamaskara* as I had learnt from my *Guru Revered Swami Adhyatmananda ji*.

3.2.THE CLASSICAL BASIS OF SURYANAMASKARA

On studying the two main old scriptures on yoga ‘*Hathayoga pradipika*’² and ‘*Gheranda Sanhita*’³ I found that there is no mention of *Suryanamaskara* in them.

If we give it a fresh look, we wonder why a yogi who is known to keep sitting motionless in one posture should be changing the posture 12 times in a minute!

For several years different thinkers have pondered about the origin and real meaning of *Suryanamaskara*. Shri Yogendra, the founder of the Yoga Institute, Santacruz, Mumbai, refused to accept *Suryanamaskara* as a part of *yoga*⁴, saying that it is more like aerobic exercises and has been indiscriminately mixed with yogic practices.

Swami Kavalayanand ji, the founder of *Kaivalyadhama*, Lonavala, near Pune has also not recognized

suryanamaskara as a part of *yoga*.

At the same time, it is also a fact that it is a highly conserved sequence of 12 postures that has been taught in several ashrams and in families as a tradition. It is taught in the Shivananda Ashram of Rishikesh and the Bihar school of yoga, Munger which also follows the same lineage. I have met several persons across wide geographical areas who have learnt it from their ancestors, who seemingly had no direct communication with each other. A common-ancestor origin of *suryanamaskara* is thus the most likely explanation.

Revered Swami Satyanand Saraswati in his book '*Asana Pranayama Mudra Bandh*⁵' has mentioned that *Suryanamaskara* which is traditionally not considered a part of Yoga is a good dynamic exercise, as it strengthens the various muscles, bones and joints. Similar views are shared by the pondicherry school. Everyone thinks that the effect of *Suryanamaskara* can be only like aerobic exercises.

There can not be two opinions about the exercise-like benefits of *suryanamaskara*..

But then, these benefits are likely to be obtained from any of the aerobic exercises taught in the gymnasium-What is so special about *Suryanamaskara*? Why should we perform these 12 postures in the specified sequence?

I used to ask this question to my father. Not being able to satisfy me with his answer, he ultimately allowed me to perform the other traditional type of aerobic exercises. Unconvinced about any special benefits to accrue from *Suryanamaskara*, I used to practice aerobic exercises in the gymnasium while studying in the medical college at Indore in the seventies.

And therefore in the year 2005 in the first edition of

my 'Yoga Book For Doctors' I had described the 12-step *Suryanamaskara* as I had learnt from my *guru*, *Swami Adhyatmanandaji*. The motive was just to maintain the tradition of the school, I wanted to hand over the knowledge to the next generation in the same form as I had acquired.

Traditions should be maintained whether one understands the full significance or not- in the belief that in some future generation someone may be able to decipher the hidden meaning.

Fortunately I happen to be the Nature's choice for performing this duty.

Now I know and I have to admit that I had not understood the real meaning of the 12-step procedure then. I am sure somewhere down the generations the link has been missed. Like a genetic mutation, an important -rather the most important- step has been deleted. Neither did my father know, nor do the *gurus* of the present day who are teaching *Suryanamaskara* to hundreds of thousands of disciples. And this is no overstatement, as you will see for yourself.

While we do not find any mention of *Suryanamaskara* in *Gheranda sanhita*, the most organised of the scriptures of *Hatha-yoga*, there is a mention of an internal cleansing process called *vata-sara*, the precise technique of which is not described. Rather, there is advice to keep this technique as a closely guarded secret.

3.3.VATA-SARA (वातसार) –

वातसारं परं गोप्यं देहनिर्मलकारकम् ।

सर्वरोगक्षयकरं देहानलविवर्धकम् ॥ घे. 1/16

'Vatasaram param gopyam dehnirmalakarakam.

Sarvarogakshayakaram dehanalavivardhakam'

‘*Vata-sara* is to be kept secret. It is a great purifier, destroyer of all diseases and increases the body heat.’

काकचञ्चुवदास्येन पिबेद्वायुं शनैः शनैः ।

चालयेदुदरं पश्चाद्वर्त्मना रेचयेच्छनैः ।। घे. 1/15

Kakachanchuvadasyena pibedvayum shanaih shanaih.

Chalayedudaram pashchadvartmana rechayetchhanaih.G1/15

Procedure:

‘One should drink air making the mouth like a crow’s beak. Then by moving the abdomen all this air should be moved down to be expelled through the lower passage’.

3.4.THE REVELATION!

It was only later, after publication of the above mentioned first edition of ‘*Yoga Book for Doctors*’ in November 2005, when I was working further on the hypothesis of ingested air reaching the pyloric region by inverted postures such as the *Sarvangasana*, while getting an X-ray barium meal done in the inverted posture I had the revelation that after filling the stomach with air by *kakimudra*, the air can be manoeuvred to enter the duodenum from where it enters the small intestines.

Thereafter a few new revelations started occurring to me.

1. The air, once it leaves the stomach to enter the intestines is not easily belched out, and is retained in the abdomen for much longer.
2. This way the stomach gets empty, and by assuming upright posture can again be filled with air.
3. The capacity of the stomach is limited, it can probably hold no more than 300-500 milliliters of air, but once we start filling the intestines, we can probably fill in about 4-5 liters of air- enough to keep one afloat in water.

4. In animal experiments, just as balloon distension of the stomach in dogs reduces food intake, filling up of intestines with air in humans in this way should induce satiety, and if it is so, the technique can be used as a therapy for obesity.

And then I started thinking afresh for postures with which we can manoeuvre the ingested air in to the intestines.

Doctors know that for doing barium double-contrast X-ray studies of the intestines, air needs to be manoeuvred in to the intestines. I asked the radiologists how they do it. I learnt that they do it in a prone position. They use aerated water to fill carbon-dioxide in the stomach.

In a way carbon-dioxide distension of the intestines should also produce some satiety, although this is obviously not the way the yogis did it thousands of years ago. Even in this age we can not recommend carbonated drinks: Carbon-dioxide can promote unwanted anaerobic bacteria in the stomach e.g. *Helicobacter pylori*. So if we have to fill air and not carbon-dioxide, we have to repeatedly assume upright posture, each time filling the stomach with air by *kaki-mudra*, and then invert the trunk, thus driving the ingested air in to the duodenum.

And then suddenly one day I recognized the real meaning of the whole 12-step process of *Suryanamaskara*—**that it has been designed to fill the intestines with air!** *Suryanamaskara*, by sequentially alternating the posture from upright to inverted and horizontal to inclined trunk aims at filling the intestines with air, and propelling it through the large intestines and out as flatus. In other words, *suryanamaskara* is the series of postures for vata-sara- the yogic technique of cleansing the intestines with air.

3.5. EFFECTS OF FILLING INTESTINES WITH AIR

It is now obvious to me that by filling the intestines with air, the Yogis achieved precisely these three objectives:

1. Keeping afloat water effortlessly-what has been described in Yoga as *Plavani*;

प्लावनी—

अन्तःप्रवर्तितोदारमारुतापूरितोदरः ।
पयस्यगाधेऽपि सुखात् प्लवते पद्मपत्रवत् ॥

ह.प्र. 2 / 70

‘*Antahpravartitodarmarutapooritodarah*
Payasyagadhepi sukhat plavate padmapatrat

Hathapradeepika 2/70

‘Having completely filled the stomach (and the intestines) with air a yogi easily floats like a lotus leaf even on deepest water’

2. Fasting without feeling the pinch: No urgency to feed oneself: Yogis have been known to be able to survive without eating; it is known that they were able to satisfy their hunger by eating air. (In the *Rigveda* it is mentioned that *Munis* survived eating air ‘मुनयः वातरशनः’⁶)
3. Cleansing of the intestines with air which probably means inhibiting the anaerobic organisms. The organism *helicobacter pylori* which is responsible for acid-peptic disease is anaerobic and can be inhibited just by air, provided one is able to make the air reach the pyloric region of the stomach, where the organism colonizes. Also of interest is the fact that most foul-smelling gases in the flatus are produced by anaerobic organisms colonizing the gut. Yogis do not emit foul odours.⁷

It occurred to me that while being handed down from generation to generation, the *suryanamaskara* has lost the most important step, that is, of filling the stomach with air with *kaki-mudra*. It is like stitching a cloth with the sewing machine without threading the needle, or snapping a series of photographs without loading a film (reel) in the camera, or sending an envelope without enclosing a letter in it or sending a rocket in the space without loading it with a satellite!! In all these processes the action appears to have been done, but misses the essential element. Just like these, performing the 12-steps of *suryanamaskaras* without filling the stomach with air is about fruitless. It may give you some aerobic exercise, but misses the essential purpose for which it seems to have been designed. (In fact yogis were not for aerobic exercises at all !!)

Now when I look back I can understand why a yogi who is known for sitting motionless is changing postures 12 times a minute!

If one looks at the whole mechanism of *Suryanamaskara* one can appreciate the beauty with which the stomach acts as a mechanical pump to propel air in to the intestines. The part of the intestines called the duodenum is fixed to the posterior abdominal wall. It becomes uppermost in the prone position and in the various yoga postures in which the trunk is inverted. The contractile wall of the stomach provides the power while the two sphincters- namely the lower esophageal sphincter (LES) and the pyloric sphincter- act as valves. In *kaki mudra* the LES opens and allows the air to enter the stomach, while in inverted postures the pylorus opens and allows air to enter the duodenum.

It is possible that in the inverted second position of *hastapadasana* even without deliberate filling of the

stomach with air, some air spontaneously present in the stomach is pumped into the duodenum. The stomach, thus emptied, may suck more air when one assumes the upright posture, at least in some individuals who are in the habit of sucking air into the esophagus. Of the thousands of aspirants who learn *Suryanamaskara* in the various yoga camps a few must be obtaining some benefit out of these in addition to the aerobic-exercise-like effect. But the things become different if one understands the basic purpose, learns the correct technique and knows what to expect from it. One is then better motivated to perform the *Suryanamaskara* regularly.

It appears that at some stage in the history of *Suryanamaskara* being handed down from generation to generation the essential key of filling air in the stomach by *Kaki-mudra* got deleted. Or it is possible that the outwardly apparent postures were taught in the childhood while the key of *Kaki-mudra* was given at a later stage, and at some occasion the *Guru* passed away before handing over the key. Or may be someone learnt the process just by observing without pleasing his guru and so could not obtain the secret key.

In the light of the above insight, now I am in a position to describe the complete process as it should be.

3.6. THE KAKI-MUDRA

The kaki-mudra has been described in the main book 'Yoga Book for Doctors', but for the benefit of those who have not read that book I shall briefly mention it here again.

काकचञ्चूवदास्येन पिबेद्वायुं शनैःशनैः ।

काकीमुद्रा भवेदेषा सर्वरोगविनाशिनी ॥ च. 3/66

Kakachanchuvadasyena pibedvayum shanaih shanaih ।

Kaki mudra bhavedesha sarva rog vinashini ॥ G 3/66

'One should drink air making the mouth like a crow's beak. This is called the Kaki-Mudra which is the destroyer of all diseases'

In practice one should project the chin forward as if pushing a wall with the chin.

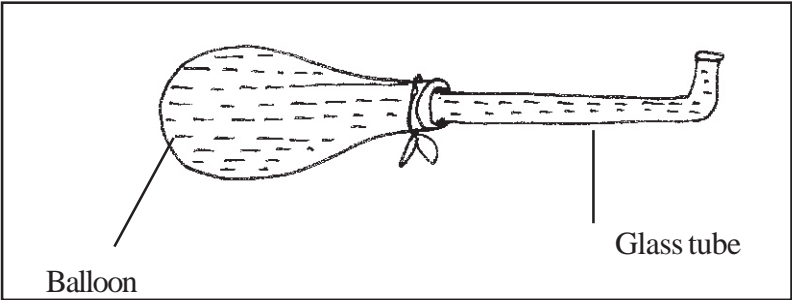


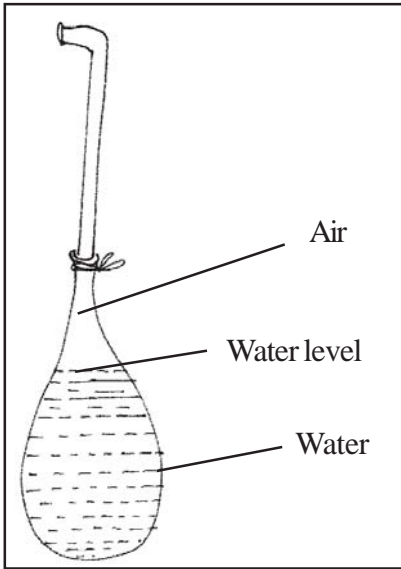
I have demonstrated that here making the mouth like a crow's beak means projecting the chin forwards, contracting the muscles of the submental region and the sternomastoids.

In the forward projecting position of the neck, contraction of the sternocleidomastoid muscles pulls the sternum forward and widens the thoracic inlet. With little practice, this manoeuver opens up the gullet and if at the same time the abdominal muscles are relaxed, air gushes in through the esophagus in to the stomach..A gurgling sound can be felt and heard with a stethoscope. This will become amply clear by two simple experiments.

3.7.EXPERIMENT 1:

Take a glass tube with one end bent and tie a rubber balloon at the other. Now fill the assembly with water keeping the tube horizontal on a table. There is no air in it at present.





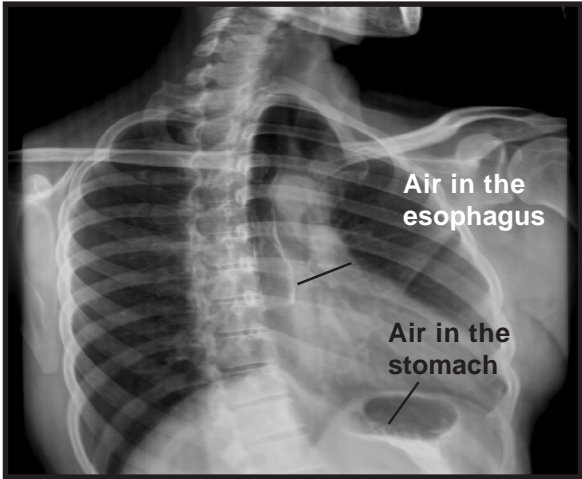
Now pick it up, make the tube vertical allowing the rubber balloon to hang. What do you observe?

The balloon droops down a little and sucks some air from the atmosphere. So that now there is a fluid level in the balloon above which there is a little air. The human esophagus and stomach also behave in similar manner. This has been proved in our earlier study.

3.8.EXPERIMENT 2.

In the lying posture, preferable with an empty stomach, drink a glassful of water. Now stand up and allow the abdomen to relax. Observe what happens at the throat. The gullet opens and allows a gush of air to be sucked into the stomach.

During Kaki mudra the esophagus opens up in its whole length. (See under)



After kaki mudra the stomach contains much more air.
(See under)



3.9. THE MANDUKI MUDRA:

It will be useful to describe one more mudra here as well.

मुखं संमुद्रितं कृत्वा जिह्वामूलं प्रचालयेत् ।

शनैर्गसेत्तदमृतं माण्डुकीं मुद्रिकां विदुः ॥ घे. 3/51

'Mukham sammudritam kritva jivhamoolam prachalayet.

Shaneirgrasettadamritam maandukim mudrikam viduh.'

G3/51

‘Closing the mouth, the root of tongue should be moved from side-to-side. The nectar so produced should be slowly swallowed. This is called the *Manduki Mudra*.

‘Closing the mouth, the root of tongue should be moved from side-to-side. The nectar so produced should be slowly swallowed. This is called the *Manduki Mudra*.

3.10. AIR FILLING SURYANAMASKARA : THE REAL SURYANAMASKARA

(with the air-filling maneuvers)

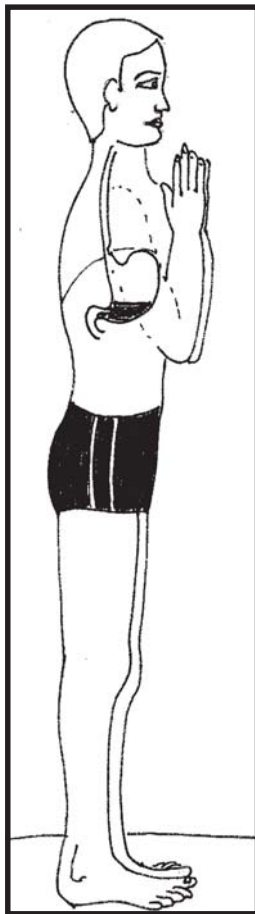
I have to use this adjective ‘*air filling*’ in order to distinguish the following manoeuvres from the currently popular form of *Suryanamaskara*. In fact, no such adjective should have been needed, as, without ingesting air with *kaki mudra*, the whole effort is nearly useless. Hence the *air filling suryanamaskara* is the real *suryanamaskara*.

3.11 STEP WISE SYSTEMATIC DESCRIPTION OF PAWAHARI SURYANAMASKARA: (The Mantras are as taught to us by tradition.)

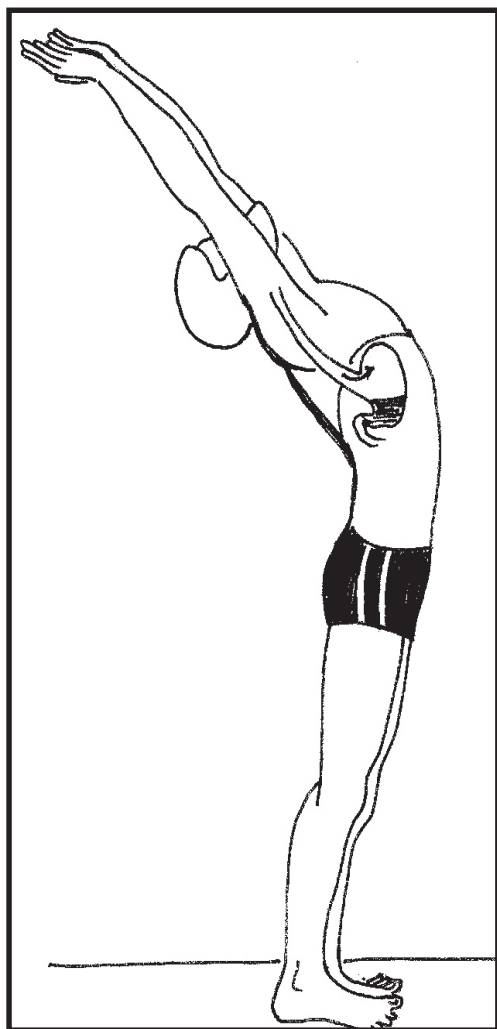
1. First position : *Mantra- Om Mitraya Namah*

It is just a standing position. It prepares you for ingesting air. By tradition one should stand facing the east.

The stomach may contain some air in the fundus region.

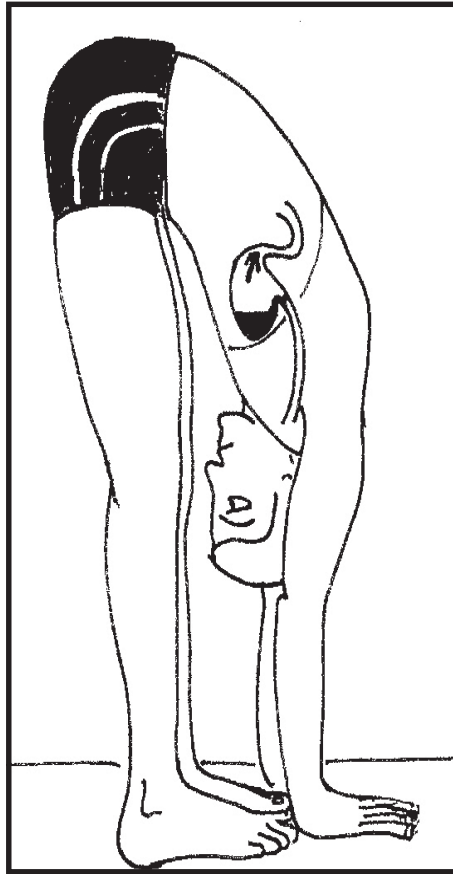


2. Second position: *Mantra-Om Ravaye namah.* Raise the arms above your head, bend the neck a little backwards, relax your abdomen, contract the sternocleidomastoid muscles, so as to lift the sternum a little to let the gullet open- in short, by *kaki mudra* suck in air to fill the stomach.



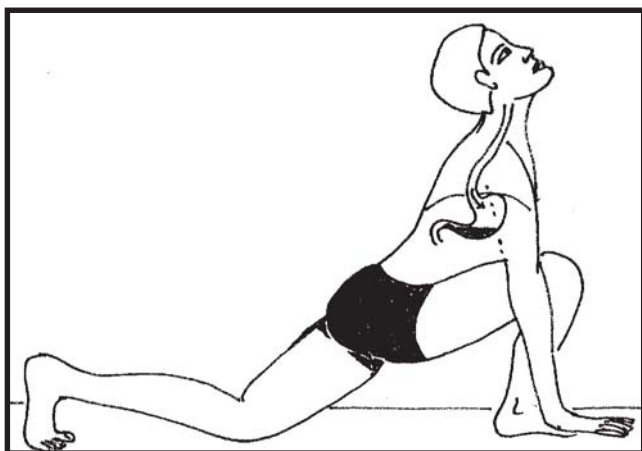
3. Third position: *Mantra- Om Suryaya Namah*

Swallowing a little saliva produced by rubbing the back of the tongue with the palate (*Manduki mudra*) bend forwards and place both the hands by the side of both the feet, the trunk should be inverted. You will **feel the ingested air moving down the duodenum in to the small intestines.** Stay in this position for about 15 seconds. Swallowing the saliva sends a peristaltic wave down the esophagus and closes the lower esophageal sphincter. This prevents the acidic gastric juice from regurgitating.



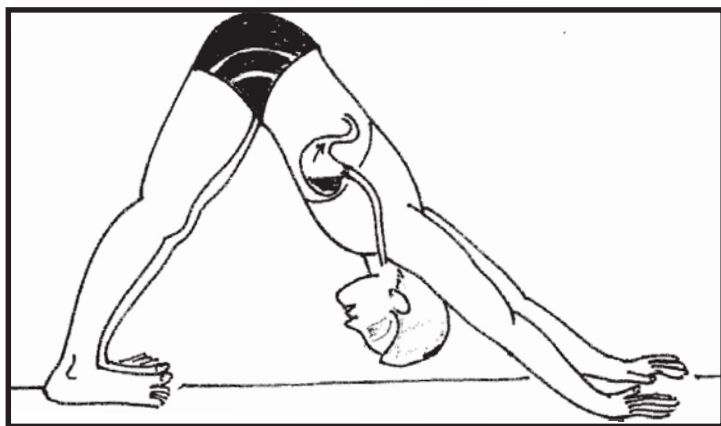
4. Fourth position: *Mantra- Om Bhanave Namah*

Place the right foot in between both the hands, flex the knee, straighten and shift the left foot backwards, look in front, again performing the *kaki-mudra*. Feel the stomach being filled with air.

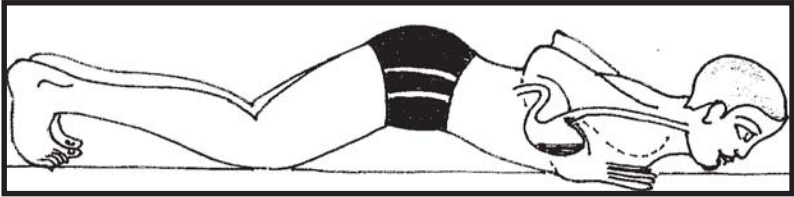


5. Fifth position: *Mantra- Om Khagaya Namah*

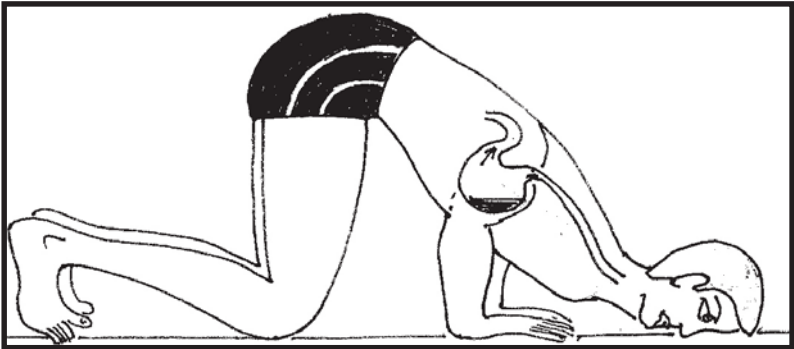
Swallowing a little saliva produced by rubbing the back of the tongue with the palate (Performing *Manduki mudra*). Lift the hips up, with the whole body's weight on the hands and feet. **The air escapes in to the small intestine.**



6.Sixth position: *Mantra-Om Pushne Namah.* Place the knees down, the hips up and the chest down. That is, be in the knee-chest position. The duodenum is the uppermost in this position and the air contained in the stomach easily escapes in to it. Stay in this position for about 10-15 seconds. It renders the stomach empty.

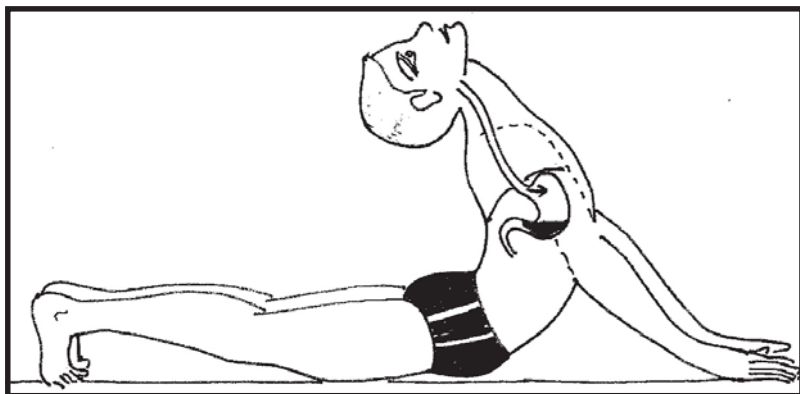


A slightly modified position (shown below) -with thighs vertical, hips elevated highest and the chest touching the floor- though difficult for many to perform, may be more effective.

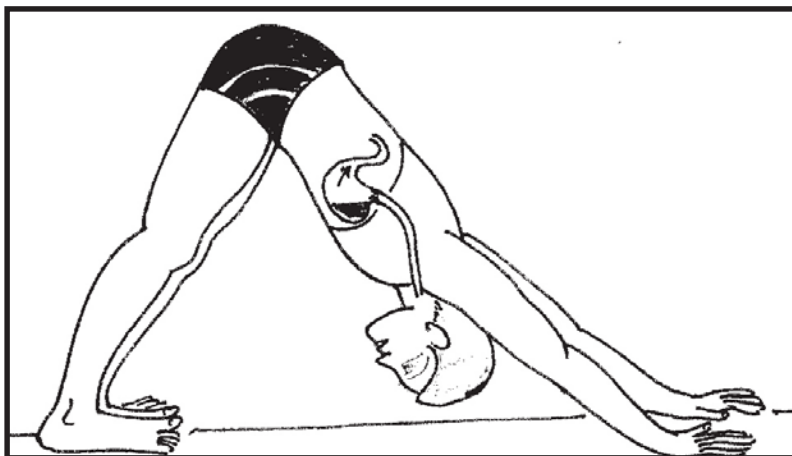


Doctors know that this is the position for Sigmoidoscopy. If the anal sphincter is relaxed, some air may even be sucked in to the recum and sigmoid.

7. Seventh position: *Mantra-Om Hiranyagarbhaya Namah.* Lie prone with the chest, head and neck lifted up. By *kaki-mudra* drink air again.



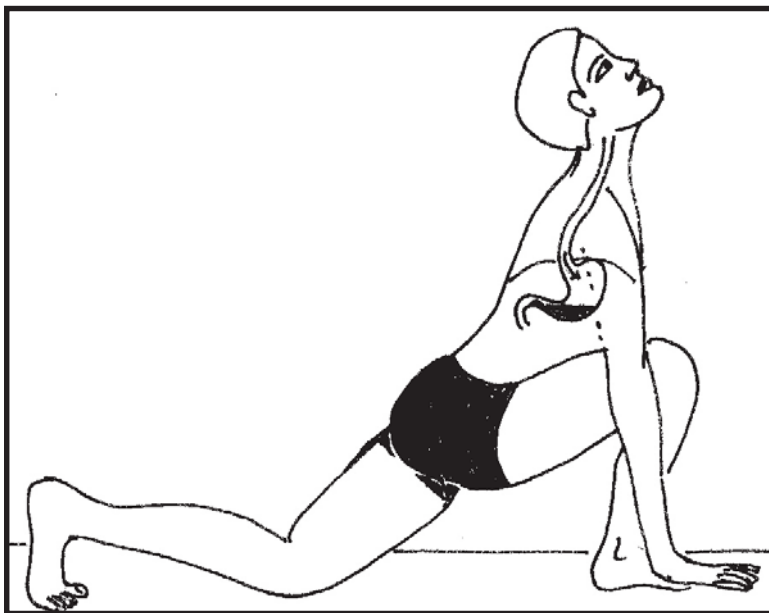
8. Eighth position *Mantra-Om Marichaye Namah.* Swallow saliva by *manduki mudra*, Again lift the hips up, bearing the body weight on the two hands and the two feet, like the sixth position. Again in this position the **air contained in the stomach enters the duodenum, thus rendering the stomach empty.**



9. Ninth position

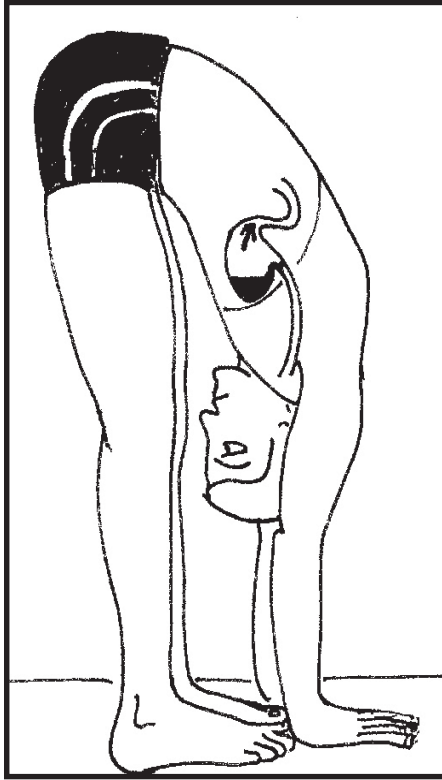
Mantra-Om Adityaya Namah

Bring the right foot forward to place it between the two hands. Look up; **drink more air by *kaki mudra***.

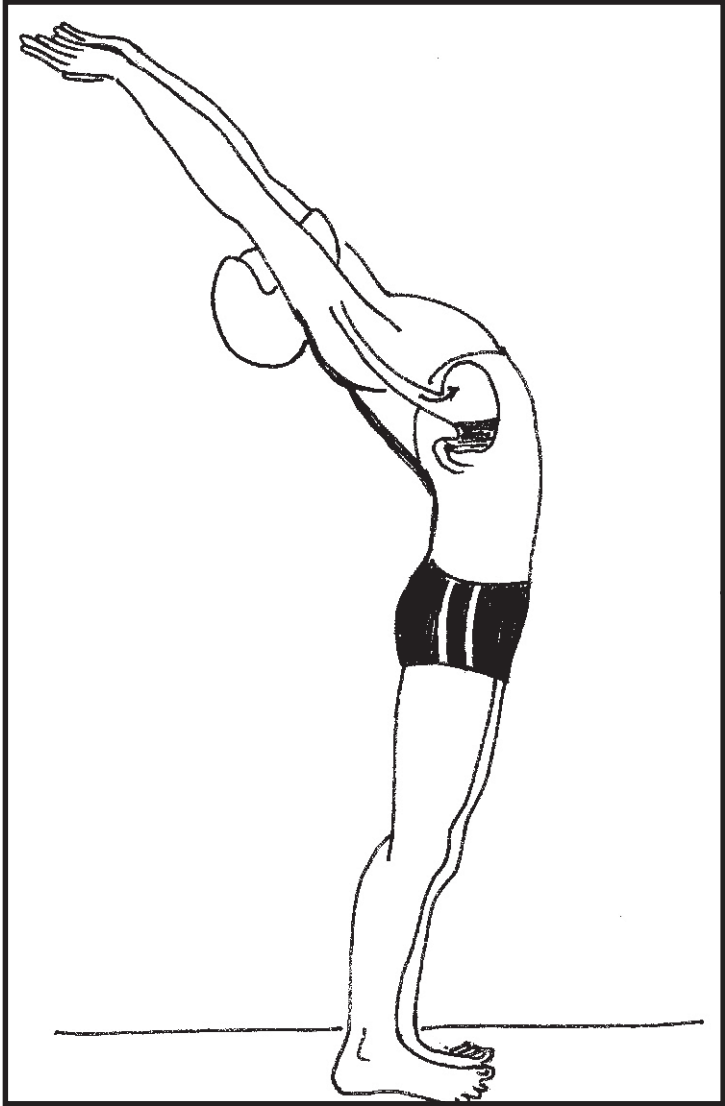


10. Tenth position: *Mantra-Om Savitre Namah*

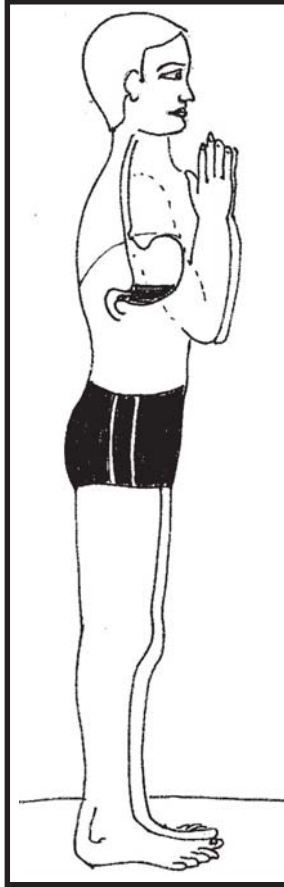
Swallow saliva by *manduki mudra*, stand bent forwards; keeping both the palms on either side of the feet. Let the trunk be inverted. **The air contained in the stomach escapes in to the duodenum and thence to the small intestine.**



11.Eleventh position: *Mantra-Om Arkaya Namah.*
Straighten up, bending a little backwards with the two hands stretched well above the head.



12. Twelfth position: *Mantra-Om Bhaskaraya Namah*
Stand straight with folded hand in prayer position.



Thus we see that air is ingested in the second, fourth, seventh and ninth position in *Suryanamaskara*. Repetition of the cycle 12 times gives you opportunity to drink air 48 times. An X-ray done before and after the 12-minute procedure is given here. It clearly shows the difference in the state of dilatation of the intestines.

Our study has shown that in these 12 cycles one accumulates enough air in the intestines to keep one afloat effortlessly.

X-ray barium meal studies before and after 12 cycles of air filling Suryanamaskara

Small amount of
air in the stomach



Barium follow through intestines before air-filling manuevers.



Loops of intestine distended with air

Radiograph after 12 cycles of *air filling Suryanamaskara*. It took the author about 15 minutes to finish these 12 cycles.

3.12.BENEFITS OF AIR FILLING BY SURYANAMASKARA

1. Those who have a tendency to become fat can use it as an easy way to keep the body weight under control. Usually we hear people say that they have tried fasting. They do lose weight. But most of them are not able to keep fasting indefinitely. Moreover, often they wonder why one person can stay lean even after eating to his heart's content the other can not?

And then some day the resolve to keep fasting breaks down. Once someone returns to full diet the body again starts accumulating fat and the lost weight is soon regained.

For those who wish to reduce weight by eating less, *air filling Suryanamaskara* can give relief from the symptoms resulting from fasting, by creating a false satiety due to distension of the intestines with air. With *air filling Suryanamaskara* within about 10 minutes the intestines can be distended so much as to give adequate satiety.

2. Several other healthy-looking people actually suffer from non-ulcer dyspepsia due to the presence of a bacterium *Helicobacter pylori* in their stomach. Such persons keep on taking a capsule of omeprazol or some similar medicine everyday. Thousands of healthy-looking people -bank officers, lawyers, teachers and all- have been consuming capsule of omeprazol for years together. Rarely, persistence of the infection may also lead to diseases like 'atrophic gastritis' and stomach cancers.

Filling up of the stomach with air and manoeuvring the air to the pyloric region where the organism resides can eradicate the infection. Air is probably the cheapest anti-*H.pylori* agent! Only it needs manoeuvring to the lower (Pyloric) region of the stomach through some inverted-

posture.

3. About 12 cycles of *air filling Suryanamaskara* lead to filling of nearly 4-5 litres of air in the intestines which is not quickly belched out. One can stay afloat water of any depth without effort, as has been described under the heading '*Plavani*'.

3.13. IMPACT ON SWIMMING COMPETITIONS

Professional and athletic swimmers can take advantage of this technique. **In fact swimming competitions and olympic swimming will not remain the same today onwards.** Only those who will be able to master the technique of *air filling Suryanamaskara* will make the best swimmers. A new set of rules may have to be made as to how much air one is allowed to swallow before entering a swimming pool!

Life savers of drowning victims will tremendously benefit from undergoing this training so that in emergency they can save a life even without the use of a life-saving jacket.

3.14. REFERENCES

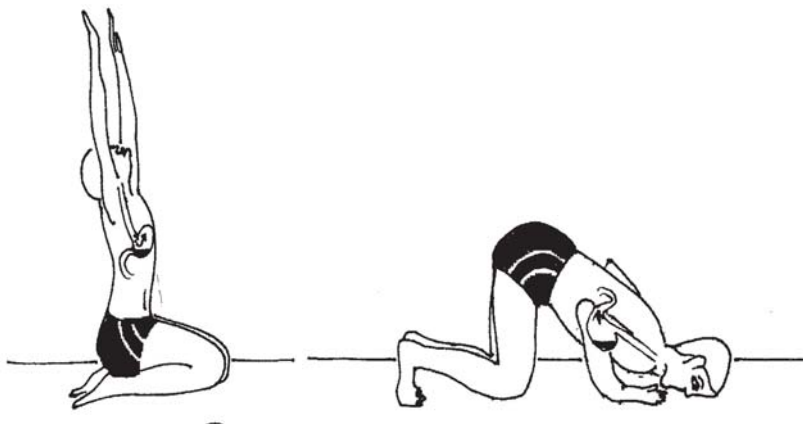
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7. लघुत्वमारोग्यमलोलुपत्वं वर्णप्रसादं स्वरसौष्टवं च ।
गंधः शुभो मूत्रपुरीषमल्पं योगप्रवृत्तिः प्रथमां वदन्ति ॥
श्वेताश्वतर उपनिषद्, 2/13
Shwetashwatar Upanishad, 2/13, Gitapress, Gorakhpur.

CHAPTER 4.

OTHER METHODS TO FILL THE INTESTINES WITH AIR:

At the Antar Prakash Center for Yoga we have experimented on some variations and developed some alternative methods to fill the intestines with air.

4.1. SIMPLE TWO-STEP TECHNIQUE: Step 1: Sit in Vajrasana, (facing east, as per tradition). Elevate the arms above the shoulders, forearms and hands stretched straight upwards. (See picture). Performing kaki-mudra, fill the stomach with air.



Step 1

Step 2

Step 2: Bending forwards, touch the chin or the chest to the ground. Elevate the hips. In short, come to be in the knee-chest position. (See picture). Maintain this posture for 2-3 minutes. You will hear a gurgling sound and with this the air passes down in to the intestines.

Repeat these two steps 5-10 times. You will have enough air in the intestines to keep you satiated for the next 4-5 hours. When feel hungry, repeat the process again.

4.2. THE SIMPLEST “PUNCTURED STRAW” TECHNIQUE:

In the studies done at the Antar Prakash Center for yoga we found it difficult to teach some individuals the technique of *Kaki-Mudra*. For them the following technique can serve as a substitute. This is an innovation !

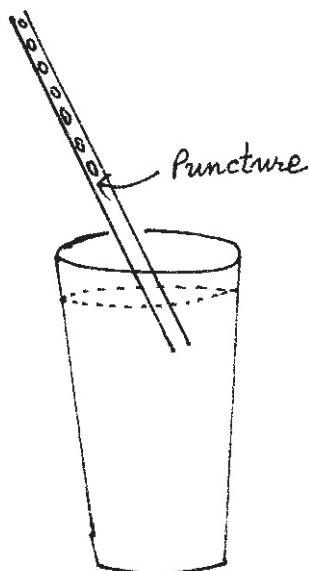
4.2.1. Practice:

Practice drinking water with a straw, making effort to make the water flow in the straw as continuous as possible rather than intermittent. One should avoid keeping the sucked-in water in the mouth, as doing so will separate the air which will then not be swallowed. When well practiced, one can notice a wave-like motion of the tongue muscles rather than the usual swallowing movements performed while swallowing solid food, and is certainly easier to learn as compared to *kaki-mudra*.

4.2.2. The technique:

Now take a straw and with a fine needle, make a small puncture at its middle. Now drink water using this straw. (see picture) The puncture site provides inlet to air while one sucks water through the straw. The water gets mixed with bubbles of air which are gulped down.

In experiments conducted at our centre we have found out that by adjusting the location and size of the puncture and sucking water fast it is possible to drink a very large proportion of air with a relatively small quantity of water



If one stays standing or sitting, (in vertical position) the swallowed air soon gets belched out. Therefore, immediately after drinking about 200-300 ml. air, one should adapt the knee-chest position and stay there for 2-3 minutes. The whole process can be repeated 4-5 times, taking about 20 minutes, equivalent to the time one takes to eat a normal meal.

The advantage of this method is that it can be used by those who are not able to master the technique of *kaki-mudra*.

The disadvantage is that there is an obligatory intake of water, but which can not be said to be harmful in any way except for that it needs to be excreted!

Drink Air, Stay Fit

The proportion of obese human population is increasing fast. Our bodies have accumulated a lot of fat, following the Nature's wisdom to provide for in times of scarcity. We know that it is leading to problems- of high cholesterol, heart diseases, osteoarthritis of the knees and sleep apnoea to enumerate a few. Each 250 grams of fat can provide us energy needed for going one day. A 10 kg extra means enough stock for 40 days.

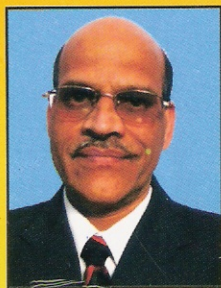
And yet, come meal time and our brain starts receiving messages from the stomach: Fill me! Fill me!!

Listen to it, O.K. But filling it with food means further increasing the body fat which has already become a burden.

Fill it, O.K., but with air- suggests the author. Drinking air may offer many more beneficial effects, especially on gastrointestinal disorders, and one may be conferred the capability to float on water!

Read to learn how.

The Author



Dr. Prakash C. Malshe is a Medical Specialist by profession. Because of his special interest in yoga, he has extensively studied the original yogic scriptures like the 'Hathyoga Pradeepika' and 'Gheranda Samhita.' By experimenting on his own body he has unravelled several mysteries, some of which he has shared in his first book, '**Yoga Book for Doctors**'.

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