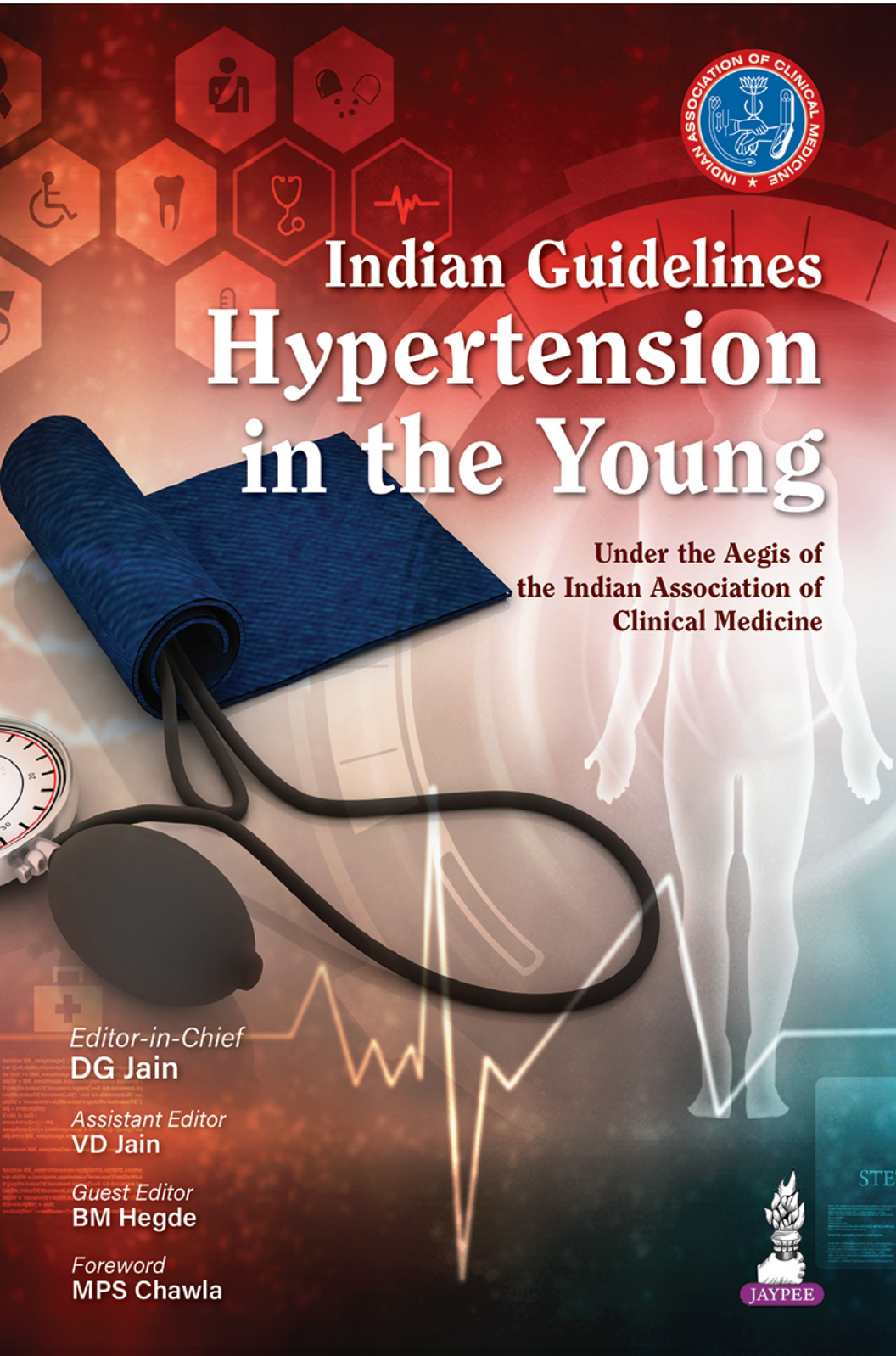
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Indian Guidelines
Hypertension in the Young

Under the Aegis of
the Indian Association of
Clinical Medicine

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JAYPEE

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CHAPTER 14

Nonpharmacological Considerations in the Management of Hypertension

BM Hegde

PRINCIPLES OF DRUG THERAPY IN HYPERTENSION

"Real hearty, healthy smiles bring down blood pressure and make for long life. I think when humour disappears, humans are also finished."

—Frantisek Dostal

The question of therapy in medicine comes after the diagnosis. The most difficult diagnosis in medicine is the diagnosis of hypertension. Since this label encompasses many maladies, both known (secondary hypertension), and the unknown, the office recording of blood pressure alone will not suffice to warrant treatment with drugs right away. The old dictum that the "War is too serious a matter to be left to the generals alone" could be applied here very aptly thus: "Hypertension is too complicated a matter to be decided on the spot by doctors alone, without due concern for the human being's total environment".

Many a time, the numbers he records might alarm the practitioner himself, and he could draw wrong conclusions, in the first place. If only the doctor could sit back, take a couple of deep breaths, and then listen carefully to the patient's woes, trying to soothe his frayed nerves; the next recording of the pressure could even have come down so much that the patient could not possibly be labeled hypertensive at that time! This scenario is not rare as many would want to believe.

Even after repeated checking of blood pressures over a period of 3 months, to make a diagnosis of mild/moderate hypertension, in the famous Australasian study, half the patients became normotensive on placebo alone, over a period of next 3 months. All that could have changed their diagnosis would be the tender loving care of the

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research team. A meta-analysis of the six major journals reporting antihypertensive treatment studies revealed that all of them had flaws in the method of checking blood pressure.

The gravity of the diagnostic dilemma must be clearer to the reader by now. To add to the doctors' problems is the fact that hypertension, per se, is not a disease. It is, at best, a risk factor for future degenerative diseases, such as stroke, heart attack, renal failure, and retinal diseases. Here, we are on a very wet wicket. Predicting the future in a dynamic system, like the human body is an impossibility, unless we have the total knowledge of the initial state of the organism. The latter is impossible at the present time. Man consists of his *phenotype* [of which we know something, viz., blood pressure level, etc.], his *genotype* (of which we know nothing at the moment), and his *mind* or *consciousness* (which has been found to play the most decisive role in disease).

The main goal of antihypertensive therapy is to reduce cardiovascular morbidity and mortality. Routine treatment with drugs is recommended by the American JNC for people with sustained blood pressures above 140/90 mm Hg, but the British recommendations put the cut off at the pressure of 160/100 mm Hg. Your best bet would be to take a via media. Monitor people in that gray zone between 140/90 and 160/100 mm Hg without drugs, but with lifestyle modifications, which are now known to be very effective.

The stress in drug treatment has been the "step-care" mode of drug therapy where one starts with one drug in small doses, building the dose gradually: adding the next drug to get cumulative power to lower the pressure. We would like to call this the "step-up" therapy. We have been stressing, since the early 70s, about the need to "step-down" therapy, wherein the doctor starts cutting down the drugs and the dosage, once he achieves the desired blood pressure levels. About 50% of the patients remain normotensive on that regime, and a small percentage would need no more drugs. This could be assessed by trial and error, without detriment to the patient's well-being. As and when the pressure starts moving up, drugs could be reintroduced. Even intermittent treatment with drugs has been shown to be good enough for mild hypertensives. Whereas we introduced it in the 70s, it is now accepted in the West, as well.

For any class of drugs to be used as the first line, there must be very compelling reasons. Keeping in mind the fact that we are only treating a risk factor, and not a disease and, therefore, our selection

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of drugs for lifelong use, in an apparently healthy individual, must be above all suspicion. When in doubt, it is better to take an opinion of the specialist in the field. This should also be done in the following special circumstances:

- Very young or very old hypertensives detected for the first time
- Patients who do not respond to the ideal line of treatment, despite the fact that the patient compliance is good (resistant hypertension)
- Hypertension with end-organ damage
- Patients with evidence of coronary artery disease, in addition
- Secondary hypertensives

The Italian cardiologist Dr Guiseppe Mancia, a great proponent of the step-care treatment, is slowly being converted to our view—which was being criticized by many—of "step-down" treatment, of using less and less drugs, as the pressures start coming down, to see if one could withdraw the drugs, at least intermittently, to lessen their side effects. "Greater importance will be given in the future for the nonpharmacological approaches, as well as to baseline blood pressure values, at which drug treatment should be started" writes Mancia, in his article in the *Journal of Hypertension,* entitled "Anti-Hypertensive treatment: Past, Present, and Future." We are pleased that our stand is being slowly vindicated! *Ours was a plea to treat with empathy the human being with raised blood pressure, and not to target the blood pressure level, without any consideration for the human being that is labelled.*----------

"There is no greater wealth than wisdom;
No greater poverty than ignorance;
No greater heritage than culture."

—Nahjul Balagha

AUTONOMIC NERVOUS SYSTEM AND THE HEART

"When one's attitude is cheerful, when he feels courageous and optimistic, and when he manifests appreciation for other people, a vitalising influence emanates from his brain to make all his organs function effectively."

—Dr H Shryock

The autonomic nervous system is a unique system, which brings about two opposing effects on the contracting myocardium simultaneously in response to a single stimulus. This paradoxical

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system is absolutely necessary to tide over stressful events in life when the sympathetic system, through its beta-adrenergic agonists, increases the cardiac output both by increasing its stroke volume (positive inotropic action) and heart rate (positive chronotropic action).

More than those two functions, beta-agonists also increase the rate of relaxation of the heart muscle (positive lusitropic action); without which there could be a dangerous situation developing. If any excitement produces only increase in heart rate and force of contraction with the help of the sympathetic system, at very high rates there could hardly be any cardiac output with proportionately less filling in diastole. Nature again has made this versatile system respond to that demand by letting the beta-agonists increase the lusitropicity, enabling the heart to maintain its diastolic filling time to a great extent intact or, at least, not reduced proportionately.

Most of these effects are brought about by the mediation of cyclic adenosine monophosphate (cyclic AMP). In other words, the typical response of the heart to the sympathetic stimulation is a more frequent rate of beating accompanied by a more forceful contraction, but the latter is abbreviated to help fill the ventricle even at that higher rate of beating of the heart.

In his article in *The Journal of the American College of Cardiology,* Arnold Katz, a noted cardiac physiologist, writes that "The available evidence indicates that cyclic AMP influences several of the reactions, both active and passive, that are involved in the complex processes of excitation-contraction coupling, contraction, relaxation, and production of the chemical energy utilized by many of these systems, viz.:

- Beta-agonists binding to the receptor
- Activation of adenylate cyclase
- Increased cytosolic Cyclic AMP
- Activation of cyclic AMP-dependent protein kinase
- Protein phosphorylation."

POSTURAL HYPERTENSION—AN INDICATOR OF SIGNIFICANCE?

Normal arterial blood pressures (BP) checked, lying and standing, show a fall in the systolic pressure by 10–20 mm Hg and a rise in diastolic pressure by 4–10 mm Hg on standing. In a series of normal people who underwent routine BP check, it was noticed that a small

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percentage of them did have an abnormal response in that their diastolic pressure rise was more than 20 mm Hg. When followed up for up to 10 years, majority of this small group had already become established hypertensives. Based on this, a new hypothesis was proposed that these could be the ones with hyper-responsive sympathetic systems. Although this study did not measure the metabolic end-products of catecholamines lying and standing, it points to this possibility of the sign being an indicator of future onset of hypertension. If proved correct in any larger prospective study, this could be used to detect children liable to get hypertension in later life so that their lifestyle could be modified.

"It requires wisdom to understand wisdom;
The music is nothing if the audience is deaf."

—Walter Lippman

HEALTH BENEFITS OF EXERCISE

"A job done as a duty is a burden,
and done as a hobby is a pleasure."

Routine exercise does confer many benefits such as better exercise tolerance, lower body weight, lower blood pressure—both systolic and diastolic, better control of blood sugar and cholesterol, lowered cardiovascular morbidity and mortality, lowered stroke risk, diminished accident rates, better social acceptability, strengthened bones in postmenopausal women, significantly reduced cancer risk of all types, better respiratory reserve, lesser incidence of viral infections, lowered risk of depression and most of all, a good night's rest at the end of the day. There are reports of well-controlled studies that even show longer life expectancy in those that are active compared to couch potatoes.

A small number of young men (five), aged 20 years in 1966, were studied extensively for their aerobic power—the body's ability to use oxygen. They were then given 3 weeks of complete bed rest. At the end of the bed rest, they were again tested to show that their aerobic capacity had declined significantly at the end of 3 weeks of bed rest. Now in their late 50s, they were completely re-examined to see the effect of aging on their systems. They had lost their aerobic power by 11%, their body fat had almost doubled, and their muscle mass was reduced significantly. Their cardiovascular capacity had declined significantly.

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They were then given a period of exercise—none of which was vigorous and there were no weight exercises. Most of the exercises were walking, bike riding, or swimming. All of them started gradually and built up slowly to achieve, at the end of the month, moderate exercise for 40 minutes a day for, at least, 5 days in a week. 6 months later, a repeat assessment showed that all the men had regained their aerobic capacity by 15%, their cardiovascular health had returned to normal, and they had less fat and bulkier muscles. They were fitter in every respect and felt a lot better. Three weeks of bed rest at the age of 20 had made them much worse than at their age of 56 years. 6 months of moderate exercise got them back to their physical health of their younger days at age 20. *"It is never too late to get back to shape",* said the author of the paper.

Various types of exercise have been scientifically studied in the past, including walking, running, cycle ergometer, calisthenics, and restrictive exercises. Although all of them do good to the human system, the best of the lot seems to be walking. The latter does not need any special sports gears, could be done in any place and weather, and most importantly, by anybody at any age.

Standard advice has been to recommend exercise durations ranging from 20 to 40 minutes a day for at least 4–5 days in a week. If done daily, it is still better. Physical activity needs to be continuous. Studies have shown that the benefit of lowered blood pressure due to exercise disappears if one stops the activity for >2 weeks.

"Catch them young" would be the best way to do this. Started early in life, the benefits could be life long, and longevity could be enhanced significantly. The by-product of this would be to distract the adolescents from the bad effects of drug abuse, television obsession, and many other criminal activities. Physical exercise confers the added bonus of a tranquil mind that reduces hatred, jealousy, and anger—the three devils that have been shown to be the most important risk factors for major killers such as heart attacks, brain attacks, and cancer.

One bad habit that delays starting of an exercise routine at any age is the temptation to postpone. People put it off to the next day and that tomorrow might never come!

"T'Morra, t'morra, Lookin' for t'morra,
My aunt became a spinster that way."

—EY Harburg (1898–1981):
T'morra (1944)

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SECRETS OF HEALTHY LIVING AND A HEALTHY HEART

"There are only two ways to live your life:
One is as though nothing is a miracle.
The other is as though everything is a miracle."

—Albert Einstein

Man is built to last by nature and, as such, has an in-built wisdom, which tries to correct most deviations from the normal in the body functions. This capacity depends, to a great extent, on the attitude of the human mind. Mind needs to be happy for the body to be healthy and be able to correct any deviations from the normal state of health. Consequently, good health needs a healthy mind. Put simply, ill health emanates from the anxieties and worries that eat into us rather than caused by what we eat. Basically, these could be divided into two classes. The poor are always anxious as they do not know where their next meal comes from, while the rich and the powerful are always anxious that they have not yet beaten their rival. Although the ravages of the mental attitudes on the body are the same on both those classes in this planet, the root causes are totally different, as one can see from the oversimplified version given above. We go deep into this dilemma in this chapter.

Our ancestors passed on some intelligence to us through our genes to take mankind forward. The genes could also mutate (change) in response to environmental changes to keep us going even in adverse circumstances.

More than them all, it is the human mind (consciousness) that makes or breaks the body and its attendant functions. A tranquil mind, filled with universal love, is an insurance against illness and disability. The truth is that any intelligent man could live happily as long as he lives making use of all the built-in methods that man is heir to, provided he keeps his cool.

Dr Paul Dudley White, the father figure of American cardiology in the 1960s—and cardiologist to the late 34th US President Dwight D. Eisenhower—was convinced of the fact that most diseases of the heart and blood vessels were preventable, particularly in the young and the middle-aged. The rate of mortality from CAD in the younger age groups of patients varies widely from one country to another. The frequency of heart attacks in the young is high among those with frank high blood cholesterol. Other features of significance include

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high blood pressure, obesity, diabetes mellitus, and social features such as excessive tobacco smoking, excessive alcohol consumption, a diet predominantly rich in animal fats, and proteins.

A study presented by another eminent cardiologist from the USA convincingly proves that "pure vegetarian" food—along with use of lipid-lowering agents (in selected cases)—can root out the epidemic of atherosclerosis, which is responsible for nearly 50% of deaths. Thus, in other words, "What we eat shall determine our fate". The key to prevention, therefore, lies in balanced nutrition right from childhood. One of the ways to "alter dramatically and positively" our health is to "change from a meat eating society to a nonmeat eating one". A balanced vegetarian diet is not only recommended for controlling heart attacks but also after the attacks to prevent their recurrence.

Pure vegetarians, living on foods low in fat and cholesterol, have much less incidence of certain diseases affecting the meat-eating populations, e.g., high blood pressure, gall stones, hiatus hernia, osteoporosis, gout, etc. As it has been proved time and again that the consumption of fat is directly proportional to the prevalence of the above-mentioned diseases, a proper vegetarian diet will diminish the frequency not only of heart diseases but also of several other illnesses. Though it is well known that most of these diseases are multifactorial disorders, yet diet being one of the important factors, it should be considered the number one step for their prevention.

The Research Commission for Heart Disease has suggested that development of high-quality vegetable protein products should be encouraged. It has further been observed that nonvegetarian food habits, consumption of alcoholic beverages and smoking, coupled with a sedentary way of life, significantly change the biophysical parameters and lead to a near-total breakdown of the normal metabolic process and thus help cause these diseases. Various studies conducted all over the world have shown that nonvegetarians have higher levels of blood cholesterol than vegetarians.

Human beings are biologically fruitarian and vegetarian. Apart from different anatomical and physiological characteristics of carnivorous animals, the shortness of the digestive tract of carnivores allows rapid evacuation to avoid decay of meat and fleshy products compared to the length of the human digestive system—26 feet!—suitable to vegetarian diet.

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Cooking media contain a high percentage of fats, which may be saturated or unsaturated. Groundnut oil, *Til* oil, and Mustard oil are rich in poly-unsaturated fats, and they lower the blood cholesterol level. The dietary fibers in green vegetables, pulses, and Bengal gram (*chana*) also lower the cholesterol. Dietary fibers are very useful in preventing CAD. Refined carbohydrates (white sugar and its preparations) should be avoided. Use of *ghee* (clarified butter) in cooking vegetables should be curtailed, though need not be stopped. Vegetables could be cooked in oils, whereas *ghee* could be used for *roti* (leavened brown bread) and bread.

Lack of balance in the vegetarian diet and unwholesome cooking are equally bad from the health point of view. A well selected and balanced vegetarian system of diet is based on sound scientific principles; it is capable of producing a healthier body and a sharper and tranquil mind.

Body, mind, and soul are the three supporting pillars of the human tripod. We cannot separate these pillars from one another. Then why not develop a healthy body right from the childhood through proper food habits, adequate exercise, and Yoga of body and mind. Such a healthy body, whose foundations are laid not on violence but on love and affection and compassion for all living beings, is bound to possess a tranquil mind and a noble soul.

"Grace is not killing, to kill disgrace;
And to eat a thing killed, profitless sin."

—Thiruvalluvar, The Kural: 800

TO DO OR NOT TO DO—DOCTORS' DILEMMA

"Of the terrible doubt of appearances,
Of the uncertainty after all—that we may be deluded..."

—Walt Whitman

There is a surfeit of information in the medical field—nearly 7% new information per month—that could baffle any practicing physician. However, the wisdom needed for patient care comes from empirical experience based on not just information but knowledge as well. We must ensure, therefore, that these three pillars of wisdom, i.e., information, knowledge, and empirical experience, are audited on an ongoing basis.

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"Knowledge" said Karl Popper "advances *not* by repeating known facts, but by refuting false dogmas". One cannot agree more. Every single hypothesis is true unless refuted by newer knowledge. Knowledge today in the medical field is replaced by information, resulting in doctors relying only on information and not wisdom. Wisdom alone should, therefore, guide us in *caring* for our patients. Wisdom comes out of empirical experience based on information and knowledge.

The new science of fractals and chaos looks at the dynamic human being as a whole, and as a part of this macrocosm. That is the future of science, including our medical science. In this era of exciting scopes and interventions, we should never lose sight of the art of medicine.

"Art" is best defined by Henry Edward Thoreau as "that which makes the man's day." The art of medicine is that which makes the patients' day. The intervention might be divine, but its aim should be to make the patient feel better at the end of the day! Medicine revolves around anxiety—patient anxiety of disability and death, and the doctor anxiety of doing more and more. Doctors, including interventionists, should try and allay these anxieties... Long live medicine which aims to "Cure rarely, comfort mostly, but console always". *Let us try to do most good to most people most of the time.* The old meaning of science that: *"Science is what scientists do"*, originally written in Dutch as *"Wotenchap is wot wotenchoppen doen",* has been proved wrong by the new meaning of science, what with its Sanskrit root "*skei"*, meaning to "*cut into"* everything you observe!

HOLISTIC LIFESTYLE CHANGES FOR WELLNESS

"Everything passes, everything wears out, and everything breaks."

—French Proverb

Illness and wellness are two sides of the same coin. Man is born with all the necessary in-built repair mechanisms to correct most, if not all, deviations in health that go on as long as s/he lives. "*Do not try to live here forever, you will certainly not succeed*", said George Bernard Shaw. He could not have been more accurate scientifically! All our efforts to remain healthy should not aim at the impossible state of immortality. This repair mechanism is the basis of our immune system. However, a holistic look at man's existence on this planet

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gives us an idea of the role played by man's genes and environment, both of which are supervised by man's consciousness. In short, most illnesses start in our minds and grow in the body, aided and abetted by the "fertilizers" such as tobacco, alcohol, wrong food habits, and pollution in our environment; of course, modulated by our genes which, in turn, depend on the environment and the mind for their penetrance. Consequently, a holistic approach to healthy lifestyle will have to look into all these aspects of human life. Reductionist ideas of lifestyle management where one or two of the above-mentioned aspects are targeted will not bear fruit in the long run.

HUMAN MIND

"The heart has its reasons which the mind knows nothing of."

—Blaise Pascal: Ib. 4, 277

Since all ills originate in the mind, the time has come to think of keeping the mind healthy to have good bodily health. How to keep the mind clean? Modern medical research has already thrown enough light on the role of the mind in major killer diseases such as heart attacks and cancer. Depression seems to be the major risk factor for cancer; depression and, most importantly, hostility have come out as the leading risk factors for myocardial infarction; anger is leading others in the race to get the credit for bringing on hemorrhagic stroke. Also, hating one's work and working under duress is detrimental to good health. Be that as it may, how do we alter this mental state? There have been attempts to alter the mental states like depression using drugs with questionable change in the risk status.

Ayurveda, the Indian science of life, has understood the mind at various levels of development (evolution) and has the right advice to change the mental states for the better. The great science of yoga is said to be the right solution. Mind has five levels: *Manas, buddhi, chitta, purusha,* and *ishwara*. Man could evolve to higher levels of the mind by his/her effort. Up until the level of *chitta*, man's ego does not alter the mental state of universal compassion. It is the ego at the level of the *chitta* that makes man unhappy and brings sorrow in its wake. It is at this level that yoga is said to be very effective.

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DIET

"Pure food promotes pure mind,
and pure mind develops life and memory."

—Manu Smriti

The essence of healthy living is moderation in food intake. There must be a wide choice of foods in the diet. Vegetarian food is healthier since man is basically vegetarian. Five to six small meals in a day would be ideal—without too much change in the food quality from its natural state; this will go a long way in helping the immune system keep its repair mechanism in excellent shape. The meals must get smaller as the day goes by, and the supper must be the smallest. Of the six, three could be fruit meals only.

Fat is an essential part of our daily intake but must be kept below 20% of the total daily intake. Deep frying anything is not advisable. If one has a disease called familial hypercholesterolemia, one might need appropriate treatment for that condition. Barring which, diet plays a very insignificant role in cholesterol metabolism. Cholesterol is a vital need of the body for building cell walls in the tissues. Very low cholesterol levels predispose to cancer in a big way!

REGULAR PHYSICAL EXERCISE

"A wise man ought to realize that
Health is his most valuable possession."

—Hippocrates (c. 460–357 BC):
A Regimen for Health

Being one of the most important parts of the lifestyle modification plan, regular physical exercise is very important in these days of sedentary lifestyles. For the hard-working labor class, additional regular exercise is not needed. Simple daily walks lasting up to 1 hour is the ideal tonic for the immune system. This has the power to keep us as healthy as possible and avoid many a fatal illness. Overexertion and heavy physical exercise are not healthy. The best part of daily exercise is the pleasure it gives to the person who takes time out to enjoy Nature *en route*. However, it should not be an obsession.

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Aerobic physical activity—brisk walking, bicycling, swimming—even if done 4–5 days in a week, is as good as daily exercise. Swimming is a good exercise for those who have the means. Walking in waist deep water could also be very good.

TOBACCO AND ALCOHOL

"Cigarette is a paper tube filled with grass, with fire at one end and a fool at the other."

These are two deadly enemies of human health, thanks to the monetary economy that promotes these two. Let us pay our tribute to Sir Richard Doll, FRS, who—for the first time—connected tobacco smoke with lung cancer and later with heart disease against strong opposition from his own colleagues and seniors at that time that it almost cost him his good job at Hammersmith Hospital, London.

Alcohol is another story wherein the gullible public has been made to understand that small amount of alcohol—especially red wine—is good for health and is a heart tonic. The truth, however, is very far from the belief.

"We drink (to) one another's health and spoil our own."

—JK Jerome

Although we do not have unequivocal evidence to say that small amounts of alcohol are bad for health, we have not even an iota of evidence to say that a small amount of alcohol in any form is good for health! However, large studies today have shown that teetotalers are better off compared to mild drinkers, and heavy drinkers are the worst. The same is the advice given by *Ayurveda*: Wise is he who does not indulge in alcohol and has controlled his senses; he does not fall a victim to physical or mental illness.

BAD GENES

"Always laugh when you can. It is cheap medicine."

—Lord Byron

If one's parents have had precocious disease below the age of 35 or so, then there is a good possibility of the genes creating problems for the progeny. However, a gene alone cannot bring on any disease in anyone. Absence of a gene is insurance against the disease, but the presence of the gene only indicates the possibility of that

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disease coming in. Any gene needs a conducive environment to penetrate and show its power (gene penetrance). If one makes the environment hostile to the gene, the gene will not be able to bring on the disease easily. That is where the diet and other factors come into play; in short, one has to have a holistic approach even to the gene's presence. Left alone, the gene is powerless. There is now evidence to show that even the genes could be influenced by the mind as shown by the inventor of the jumping genes hypothesis, Barbara McClintock, the Nobel laureate botanist: primacy of the mind again!

In conclusion, one could easily understand that the human body works as a whole and not in bits and pieces. The human mind is the driving seat for wellness as well as illness. Man has two powerful attractors in phase space—a dynamic attractor called health, and a static attractor called death. Since health is a dynamic state where every parameter and each organ of the body keep actively changing all the time, health is a more durable state. Even if man gets thrown out of the healthy chaotic state, the natural tendency, most of the time, is to get thrown back into the state of health attractor for which all the technology is built into the repair mechanism by nature, the immune system.

Occasionally, if man gets thrown out too far into the phase space nearer the static attractor called death, s/he might die. It is in this state of illness that man could suffer a lot and needs medical help. Problem comes only when doctors intervene unnecessarily with drugs and surgery at the time when man is only thrown out of the healthy chaos temporarily, albeit with a natural tendency to be attracted back into the healthy attractor. Doctors do play a very important part even in these situations if they use their placebo skills to encourage and empathize to help the patient to get back into the healthy attractor, which is the rule. Wellness, therefore, should be the motto of the medical profession. A healthy lifestyle would certainly keep one healthy until death.

"To lengthen thy life, lessen thy meals."

—Benjamin Franklin

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Indian Guidelines
Hypertension in the Young

Hypertension *per se* is not a disease but is definitely a risk factor of immense importance. Of late, the prevalence of hypertension in the young adult population in India is rising—more in men than women. Young-onset hypertension (YOH) is defined as the onset of hypertension in individuals aged ≤ 40 years. This number is escalating with lifestyle behaviors and the lowering of international hypertension diagnostic thresholds to SBP/DBP of 130/80 mm Hg. In India, an increasing number of young persons are at risk of developing hypertension due to a multiplicity of factors—rising affluence, urbanization, sedentary lifestyle, changing dietary habits, obesity prevalence, social stress, and possibly genetic factors—thus increasing the risk of cardiovascular events in middle age, resulting in impaired health and productivity. As a result, it contributes to an earlier onset of coronary heart disease, heart failure, chronic kidney disease, ocular hemorrhages, stroke, transient ischemic attacks, cognitive decline, and dementia.

These first-of-its-kind "*Indian Guidelines on Hypertension in the Young*" aim to increase awareness among physicians of the ever-increasing community of young hypertensives in India. The guidelines have laid out a succinct roadmap to assist the internist in tackling the many challenges posed by this risk factor and managing it effectively with a multipronged, cost-effective approach.



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