Chapter - 1

INTRODUCTION
The purview of the social scientist can not remain confined to mere theory building and academic concern. It is imperative that information which is generated must meaningfully and effectively address itself to alleviation of problems which impact adversely on quality of life and sense of well-being. This would not be possible if the social scientist confines himself within limited boundaries and does not keep himself open to knowledge emerging from other disciplines. One of the fields of study which the psychologist has found of great importance to enlarge understanding is that of medicine. Historically too there was interaction between the two disciplines - developments in medicine inspired the scientific model of abnormal psychology and developments in psychology persuaded medicine to accept the concept of psychosomatic medicine. Therefore, social sciences like psychology are constantly enriching themselves through interaction. Even today, it is being appreciated more and more clearly that the individual is a holistic entity with his physiological systems and psychological characteristics all working in coordination and unison. Therefore, no psychological problem can be understood without reference to physiological processes and pathology and no physiological disease can be understood clearly without appreciating the psychological basis and involvements.

This attitude is reflected in the American Psychological Association's diagnostic system in which an important index of assessment for purposes of diagnosing mental pathology is in terms of medical history which is noted on axis III. With more and more researches conducted with
this attitude the role played by psychological factors in the etiology, progress and treatment of physical disease has been highlighted. It has also been brought out that psychological interventions can serve an important therapeutic purpose in treatment of physical disease. More and more work is being done in this direction - the quest for the most effective psychological strategy to cope with disabling physical disorders is on.

One of the areas in which a very significant role may be played by psychological interventions is hypertension and cardiac disorders. For example, the role of psychological factors in cardiac disorders has been indicated clearly in the vulnerability of the A-type personality to suffer from cardiac disorders as compared to B-type personality. Type-A individuals have certain psychological characteristics, such as an intense competitive drive for achievement and advancement, an exaggerated sense of urgency of passing time and of need to hurry, and considerable aggressiveness and hostility towards others. It appears logical that when causation is based on psychological factors, effective treatment strategy may emanate from the same area.

Two main cardiovascular disorders, hypertension and coronary heart disease are the largest killers in the world society today. Every year, millions of people die from cardiovascular degeneration - including hypertension, heart failure, stroke and kidney disease. Many people experience the anguish of chest pains known as angina pectoris, which indicate cardiac strain in the activities of their daily life.
Medical science has developed many powerful drugs to control the effects of hypertension and cardiac disorders. These drugs are very essential as they are life saving in acute situations but at the same time these drugs have a lot of harmful side effects. People are looking for an approach which would help them not only to remove the symptoms of the disease but also to protect them from negative side effects. Further if a strategy can go to the very roots of the problem so as to relieve and prevent episodes, it would be highly desirable. Many strategies other than medication are proving useful in alleviating the anguish of chest pain and fear of hypertension. These strategies include dietary management, changes in life style, weight reduction through aerobic exercises, relaxation techniques and yoga.

**Meditation** is a strategy that has met with great amount of success in these pathologies. Today we are seeing the emergence of meditation as a vital aspect of modern life. Meditation induces a deep state of rest which encourages repair and improved health of all the cells and tissues of the body. Research is now showing that most bodily functions can be controlled by means of meditation. Meditation therefore has a great role to play in the treatment of physical disease.

The concept of meditation has come to public attention recently, but if we look through the pages of history we find that there was awareness and knowledge with regard to it in ancient times also. In fact, meditation was not confined to any region, religion, culture or a particular group of individuals. It was a worldwide practice, having its roots in
ancient world society. In ancient Egypt the pyramid was used as a chamber of initiation into practice of meditation. "The Egyptian Book of the Dead" reveals that a system of progressive harnessing of psychic energies was being practised for spiritual regeneration. Similar information can be seen in "Tibetan Book of the Dead", Plato's "Phaedo" and "The Divine Pymander of Hermes Trismegistus". In ancient Greece meditation was learnt through initiation into a secret society that preserved the truths and revealed them progressively in the form of graded series of mysteries.

The Essenes, who were a brotherhood of spiritual aspirants living in Palestine and some regions of Egypt emphasized techniques of physical and mental purification. The meditative practices followed by Essenes resembled Indian meditative practices. Origin of meditation in ancient China can be seen amongst the followers of Taoism, who underwent different meditative practices that were similar to yogic practices of meditation. In Christianity, importance of meditation can be seen in the writings of Christian mystics like Albert Magmus a 13th century figure. Reference to meditation is there in the Bible and other texts. Many practices which are part of prayer and worship include activities which come under meditation.

Practices of meditation can be seen in Buddhism which is widespread in different parts of the world. In Buddhism a large number of practices can be traced from very simple to the magical. It has one of the richest cultures of meditation. Meditational techniques used by Buddhists differ according to the schools of Buddhism. Main schools of Buddhism
include Southern Buddhism, Tibetan Buddhism and Zen Buddhism. Meditational techniques practised in Southern Buddhism include (i) anapanasati, observation of the breathing process; (ii) walking meditation, (iii) vipasana, usually in the form of concentration on body sensation; (iv) metta meditation. These techniques aim at developing mindfulness by bare attention. In Tibetan Buddhism there is a wide range of meditational technique, e.g. (i) Vajrayana meditation, (ii) Chenrezie-salutations to thee, and (iii) seed syllable. Zen Buddhism teaches the importance of direct contact with the soul. Zen Buddhism includes two main meditational techniques i.e. Zazen (seated meditation) and koan. In Zazen, the aim is to establish harmony between the body, mind and breath, and then transcend the body and mind so that one can maintain a state, where there are no thoughts. The Koan is an extreme and controlling method of forcing intense concentration on one single thought.

Within the Indian context, meditation has its roots in the pre-Aryan period which dates back to nearly 3000 years BC, during the time of Indus-valley civilizaiton. Meditative practices like Upasana which are even at present in practice, were found in Vedic religion. In Sanskrit, 'Upasana means : service, attendance, waiting upon, engaging in, being intent on, performing, worship, respect and adoration. These meanings suggest object-relation involving some action. Upasana is objective meditation that involves concentration of mind on an object. Upasana can also be seen in Upanishadic period, where it was propagated by Upanishadic thinkers. Patanjali who lived in second century B.C., codified all existing
theoretical aspects of yoga. He gave eight aspects of yoga, and meditation was one amongst these eight aspects. According to Bhajananda (1981), Upasana underwent modification in the post-vedic period under the influence of tantra. Tantric tradition in India brought out certain changes in meditative practices. In the middle ages, new techniques of meditation were developed under the influence of Yoga and tantra.

Meditation can also be seen deep rooted in Sufism. Sufism traces its origin back to the Prophet of Islam PBUH, and takes inspiration from the Devine Word as revealed through him in the Koran. The recitation of Koran was an important means of leading the spirit into a meditative state, or even of producing a mystical rapture. Recited in beautiful notes, the rhythmic and musical wordings of the holy book carried the minds of the devout into higher spheres which might open a higher level of understanding for them. The history of sufism is a history of the spiritual, theological and literary movements inside Islam. Muhammad PBUH is the first link in the spiritual chain of sufism, and his ascension through the heavens into the divine presence became the prototype of the mystic's spiritual ascension into the intimate presence of God. The main sufi orders, who propagated the practices of sufism were (i) Qadiriya founded by Mahyi-aldin Abd Qadir, (ii) Suharwardiya founded by Shihabaldin, (iii) Shadiliya founded by Nur-al din Ahmad and (iv) Maulawiya which was founded by Jalaludin Rumi. The tradition of sufism in Indian subcontinent is as old as the coming of Islam. In India main propagators of sufism were Moin uddin Chisti, Ali Hijuiri, Nizam-ud-din Auliya, Mukhdum-i-Jahaniyan
and Saiyed Ali Hamadani. Sufi's are the spiritual guides. Sufi's are renowned for their ecstatic trance states attained through chanting and dancing meditation. By singing and chanting the name of Allah by night and day they reach a point of attaining cosmic ecstasy.

Sufi's nurture and develop intuition by means of meditation. Besides meditation and self mastery, prayer is the great instrument of attainment. Sufi's make particular use of prolonged repetition of God's names, the Dikr, in which they seek to shut out all forms of consciousness other than their striving for union with Him. The Dikr must come from the bottom of the heart. Some devotees on discerning the manifestation of the soul by flashes of intuition in deep meditation, its relations with the world of phenomena, its mysteries and incomprehensible nature and its vastness pervading the world of things and mind, take the soul as being the protector of the universe and worship him as the supreme.

Meditational techniques used by sufi's include predominantly zikr, sama, moving meditation and various sitting meditation techniques. Zikr means remembrance. Zikr denotes the devout invocation and repetition of the holy name of God, either alone or enshrined in some formula. Sufi masters attached great importance to zikr, because they held it to be the best way to impress mind and set up conditions for achievement of close attention and concentration of souls powers on that which is the very purpose of the mystical journey. This combination of meditation and invocation produces a climate of confidence and certainty in the soul and prepares it for the state of contemplation. Ghazali in his
Persian work, the Kimiyayi sadat (philosophers stone of happiness) and in his great Arabic work, the Ihya ulum ed Din, enters great detail as to the nature and advantages of this practice. The other method much favoured by sufi's in the wake of great ecstatic Jalaled Din Rumi, with view to encouraging and reinforcing ecstasy and trance is known as sama which means listening or audition.

Earlier meditation was a technique that remained confined to a particular sect of individuals. In India also meditation was common only amongst sadhus and sufis, and their aim was to reach closer to God by means of different meditational techniques. But in the present world scenario, the trend has changed. Now meditation is no more a confined tool of sadhus and sufis but it is widely used by philosophers, social scientists, psychologists and medical practitioners.

According to Carrington (1987), in contemporary psychological literature meditation is a broad and generic term to include (i) all those different connotations of yoga as a spiritual discipline, (ii) all those spiritual practices prevalent in other traditions like Buddhism, Sufism, Christianity, Judaism, Kabalah and Taoism, etc. and (iii) to refer to many other mental devices or techniques developed by researchers, for example, clinically standardized meditation. Thus the term is used as a "conglomerate word" and under this conceptual umbrella a number of "different techniques and intents" are grouped (Carrington, 1987). They include sitting quietly, relaxing, closing the eyes, breathing deliberately, focussing attention on an object or image non-analytically, observing the
thought process without judging, repeating sounds mentally, rhythmic moving of the body as in sufi dervish dance, and so on.

Naranjo and Ornstein (1971), categorise all the different meditative practices into three types viz., the way of forms (concentration, absorption, union, outer directed, apollonian), the expressive way (freedom, transparence, surrender, inner directed) and the negative way (elimination, detachment, emptiness, centred, the "middle way"). Goleman (1977) groups them into two types viz., "concentration" and "opening up" meditation. Carrington (1987) distinguishes "centring" techniques from "meditation".

The conceived objectives of such practices are as follows: (i) A heightened awareness of physiological and psychological processes leading to their voluntary control, (ii) Effecting changes in different aspects of mental functioning and personality, (iii) Inducing changes in interpersonal and social behaviour (Carrington, 1987; Johnson, 1982; Naranjo & Ornstein, 1971). The final aims of these practices are understood as the development of insight into the nature of mental functioning, identity, consciousness, and reality (Walsh, 1983).

Besides classification based on the underlying psychological processes meditation is also categorised based on goals. Carrington (1987), speaks of "practical" and "spiritual" meditation. Spiritual meditation is historically embedded in centuries-old religious traditions. Practical form of meditation is contemporary and frequently practised in the West. The objective of spiritual meditation is to attain spiritual
development, through a process of deepening the range of the human spirit and changing the entire life of a human being. Practical meditation affects the practitioner's life in certain practical ways, without changing their lives in an essential fashion.

People have practised meditation for centuries. Philosophers and religious teachers claim that meditation allows the practitioners to realize their true identity, achieve peace of mind, and move closer to God. Social scientists in general, and psychologists in particular, have understood it to mean that meditation reduces psychological problems such as anxiety, depression and stress. In more general terms, psychologists argue that meditation leads to better emotional and physical health. The claimed benefits of meditation have heightened interest in it and has led to a proliferation of meditation procedures. Two types of meditation which have received great deal of attention, from researchers and practitioners alike, are concentrative meditation and mindfulness meditation. In concentrative meditation, the emphasis is on focussing on a sound, prayer, phrase, or object to control/minimize thoughts and other cognitions; in mindfulness meditation, the practitioner is encouraged to attend to, or focus upon, thoughts and sensations (Kabatzinn, 1993).

Dua (1983), summarized the religious and non-religious techniques discussed by Benson and others (1974) and concluded that most meditation procedures included the following common elements:

1. Sitting or lying down, in a comfortable position, quietly and calmly, preferably with eyes closed.
2. Repetition of a prayer, word, or sound.
3. Breathing control or breathing exercises.
4. Removal of all distractions and all thoughts.

The efficacy of meditation in treatment of disorders like hypertension and angina is being constantly explored. In order to be able to hypothesize a possible role of meditation in such disorders, it is important to understand the mechanisms and processes involved in these disorders.

**Hypertension** which refers to an elevated arterial pressure is probably the most important public health problem in developed countries. Patients with arterial hypertension and no definable cause are said to have primary, essential or idiopathic hypertension. Undoubtedly, the primary difficulty is uncovering the mechanisms responsible for the hypertension in these patients is attributed to the variety of systems that are involved in the regulation of arterial pressure, peripheral and/or central adrenergic, renal, hormonal, and vascular - and to the complexity of the interrelations of these systems. Essential hypertension has been reported to afflict 92-94% of general population (Harison, 1998). According to national projections of Indian Council of Medical Research (ICMR) and All India Institute of Medical Sciences (AIIMS), 40-45 million Indians are reported to suffer from hypertension. The number is expected to rise to 54-60 million by the year 2001 (Jain and Jain, 1998).

**The physiological factors** which have been proved to play an important role in hypertension are, according to Harrison (1998) heredity,
biochemical factors, cell membrane defects, insulin resistance and physiological factors accounted for by environment.

Genetic factors have long been assumed to be important in the genesis of hypertension. Both monogenic defects (e.g., glucocorticoid remeivable aldosteronism and Liddles syndrome), and susceptibility genes (e.g. the angiotensinogen gene) have now been reported which have, as one of their consequences an increased arterial pressure.

Amongst biochemical factors role of renin is important. Renin is an enzyme secreted by the juxtaglomerular cell of the kidney and linked with aldosterone in a negative feedback loop. In consequence, some hypertensive patients have been defined as having low-renin and others as having high renin essential hypertension. Sodium ion and chloride ion play an important role in the elevation of blood pressure in salt sensitive hypertension patients. Calcium also has been implicated in the pathogenesis of some forms of essential hypertension. A low calcium intake has been associated with an increase in blood pressure.

Cell membrane defect leads to an abnormal accumulation of calcium in vascular smooth muscle; resulting in a heightened vascular responsiveness to vasoconstrictor agents.

Insulin resistance and/or hyperinsulinemia have also been suggested as being responsible for the increased arterial pressure in some patients with hypertension. Several studies have found that hyperinsulinemia and insulin resistance are present even in lean hypertensive patients.
A number of environmental factors have been implicated in the development of hypertension, including salt intake, obesity, occupation, alcohol intake, family size, and crowding (Harrison, 1998).

**Coronary heart disease** (CHD) has been defined as "impairment of heart function due to inadequate blood flow to the heart compared to its needs, caused by obstructive changes in the coronary circulation to the heart" (WHO, 1982). It is the cause of 25-30 per cent of deaths in most industrialized countries (Parks, 2002). A survey conducted by Chadha and others (1990) in Delhi indicated that prevalence of CHD is 9.67% in the age range 25-64 years, while electrocardiographic criteria alone yielded an estimate of only 3.14%. CHD takes two principal forms i.e. angina pectoris and myocardial infarction.

Angina pectoris ranges from a mild ache to most severe pain. The typical patient with angina seeks medical help for troublesome or frightening chest discomfort, usually described as heaviness, pressure, squeezing, smothering, or choking. The symptoms usually last upto 1 to 5 minutes. Angina can radiate to the left shoulder and to both arms and especially to the ulnar surface of the forearm and hand. It can also arise in or radiate to the back, neck, jaw, teeth and epigastrium. Although episodes of angina are typically caused by exertion (e.g., exercise, hurrying or sexual activity) or emotion (e.g., stress, anger, fright or frustration) and are relieved by rest, they may also occur at rest, and at night while the patient is recumbent. The patient may be awakened at night distressed by typical chest discomfort and dyspnea.
Myocardial infarction (MI) occurs with chest pain, similar in character to exertional angina pectoris, but usually occurring at rest and lasting for some hours. The pain may be so severe that the patient may fear imminent death (angor animi), but it may be less severe and mistaken for indigestion. It is usually sudden in onset, but it may develop gradually. The pain of MI is often associated with restlessness and the patients usually cannot remain still. Sweating, nausea and vomiting are often associated with MI.

**Amongst physiological causes of CHD**, the most common is coronary atheroma, which causes a fixed obstruction to coronary blood flow. Kumar and Clark (1987), have suggested age, sex, family history, serum cholesterol, smoking and hypertension as physiological factors responsible for CHD. They point out that atherosclerosis develops progressively as age advances. It is rarely present in early childhood, except in familial hyperlipidaemia, but it is often detectable in post-mortem specimens of young men between 20 and 30 years. It is almost universal in the elderly. According to them, men are more affected than premenopausal woman. However, after menopause the incidence of atheroma in women becomes similar to that in men. Family history also plays an important role in the development of CHD. Coronary heart disease is often found in several members of the same family. Because the disease is so prevalent and because other risk factors are familial, it is uncertain whether family history is an independent risk factor (Kumar and Clark, 1987).
Since atherosclerotic plaques contain cholesterol, a high serum cholesterol, especially when associated with low values of high density lipoproteins, is according to them, strongly associated with coronary atheroma. It is also suggested by them that in men, the risk of developing coronary heart disease is directly related to the number of cigarettes smoked, but this relationship is less certain, but still important, in women and in cigar and pipe smokers. The risk from smoking declines to almost normal after 10 years of abstention. Further both systolic and diastolic hypertension are associated with an increased risk of coronary heart disease. The risk is the same for men and women.

Other factors include lack of exercise, diabetes mellitus, or even just an abnormal glucose tolerance. Obesity is certainly associated with coronary heart disease, but it is not certain whether obesity itself is independently linked with the condition. Gout, oral contraceptives, alcohol and soft water have also been suggested as risk factors for coronary atheroma (Kumar and Clark, 1987).

**Psychological factors** relating to hypertension and CHD also need to be understood. In the last two decades, emphasis has been placed on the interaction between psychological states and social and biological variables. According to the biopsychosocial model, a person can be regarded as a system with interacting biological, psychological and social subsystems (Eng, 1977).

Two main cardiovascular disorders, hypertension and coronary heart disease have been studied from psychophysiological standpoint.
Evidence has made it clear that the psychological factors of stress, personality characteristics, life style, cultural factors and negative affects like anger, may also play an important role.

Stress is one of the important psychological factor associated with hypertension and CHD. There is an overwhelmingly large amount of evidence which links stress with hypertension and CHD. In 1981, Herd found sympathetic adrenomedullary system forms the critical link between stress and cardiovascular disease. According to Guyton (1981) overall physiological effect of stress leads to enhanced lipid mobilization concurrent with elevated blood pressure and cardiac stimulation. Author goes on to say that if cholesterol levels are elevated (under influence of stress, diet, or genetic factors), a plaque or cholesterol deposit can form. As local degeneration of the blood vessel continues, its inner diameter narrows and the vessel loses its elasticity, resulting in a condition called atherosclerosis or hardening of the arteries. Atheroclerosis plays an important role in causation of angina pectoris and myocardial infarction.

Schnall (1990) in his study on 215 male workers related occupational stress to blood pressure elevations. Difficult work environments were found to result in hypertension. He found that subjects with high occupational stress faced three times greater risk of having high blood pressure, and coronary heart disease than those without occupational stress. A highly stressful job markedly increases the risk of high blood pressure (Edwards, 1973).
Many studies have found that a high level of job strain is associated with increased risk for myocardial infarction (Schnall & others, 1994). Lynch (1977) argues convincingly that the relatively high incidence of heart disease in industrialized communities stems in part from the absence of positive human relationships.

Personality as a psychological factor plays an important role in the development of cardiac disorders. Although involvement of personality in terms of Type A personality has been found in vulnerability to cardiovascular disorders, there is new some evidence that Type A also increases vulnerability to hypertension (Dembroski and others, 1979; Glass and others, 1980). Studies in numerous laboratories have suggested that people with enhanced sympathetic reactivity are at increased risk of developing both CHD and hypertension. People displaying Type-A behaviour show sharp increases in plasma catecholamines (Friedman, and others 1975) and blood pressure (Dembroski and others 1979) in response to a social challenge, compared with less reactive people, who are classified as Type-B. Presence of a hostile opponent during competition elicited significantly greater increases in systolic pressure, heart rate, and plasma epinephrine in Typ-A subjects than in Type-B subjects (Glass and others, 1980).

The inclusion of the Type A, coronary prone behavioural pattern, however, has repeatedly been shown to improve the prediction of heart disease (Friedman & Rosenman, 1974). In a prospective study, Roseman and others (1975), reported that Type A men have twice the incidence of
coronary heart disease as have type B men. Another prospective study, is Framingham Heart study. Analysis of the data for CHD occurrence during an eight-year follow-up period not only confirmed the major findings of the western collaborative group study (WCGS) project (Rosenman and others, 1975), but extended them to women as well. In fact the two-fold increase in CHD risk reported for type A men was almost exactly replicated for type A women. The CHD Type A association among males in this study was limited to those of white collar socio-economic status (Haynes and others, 1980).

Other findings (e.g. Almada, 1991; Williams and others, 1986) suggest that cynicism is a major factor within the Type A complex. The amount of coronary artery blockage and coronary deaths were especially high in Type A participants who had earlier endorsed MMPI items reflecting a cynical or hostile attitude. Barefoot and others (1983), found a higher rate of CHD and death in those whose answers had indicated cynicism suggest a possible role for it in CHD.

Today a great deal of attention is being paid to the role of lifestyle in the development or maintenance of many health problems. "There have been tremendous changes in the environment and conditions of living of human beings. There is good reason to believe that in those changing environments, incessant stimulation of the sympathetic nervous system is largely responsible for the high incidence of hypertension and other similar serious diseases" (Gopal, 1975).

A recent study has provided evidence that there may be an important relationship between the general pace of life in a community
and the incidence of cardiovascular disorders (Levine and others, 1989). The researchers found that pace of life was strongly related to death rates from coronary heart disease both across cities and across regions of the country. A faster pace played a role in higher rates of CHD, while communities with slower paces of life had lower rates of CHD.

Cultural factors have been reported to play an important role in the development of CHD. A study in which Japanese living in Japan were compared with Japanese-Americans living in Hawaii and California highlights the importance of cultural factors in the development of CHD (Marmot & Syme, 1976). The native Japanese had the lowest incidence of CHD; the Japanese-Americans living in Hawaii had a somewhat higher rate; and the Japanese-Americans living in California had the highest frequency of heart disease.

Anger has been identified as an important psychological factor in the development of hypertension. Anger produces short-term elevations in blood pressure. Blood pressure fluctuates in daily life depending on a person's mood, rising notably during anger (Schwartz and others, 1994). Anger may function differently in men and in women. Expressing anger is related to increased blood pressure reactivity in men, whereas suppressing anger is linked to higher blood pressure reactivity in women. (Shapiro, Goldstein and Jamner, 1995). Chronic anger and anger suppression have been identified as particularly important factors (Chesney and Rosenman, 1985). While everybody is exposed to anger-provoking situations, according to one theory, hypertensives experience chronic anger because
of their inability to express it or assert themselves in a society desirable manner.

Medical treatment of hypertension and CHD includes drug therapy and surgery. In emergencies angina patients may be advised to take tablets of glyceryl trinitrate sublingually, whereas pain in MI may require morphine. Surgery is another intervention which may be recommended by the medical practitioner.

A large number of drugs may be used in treatment and these are usually selected on the basis of efficacy, tolerance, and compliance. Commonly used first line agents for hypertension and CHD are thiazides diuretics, b-blockers, calcium antagonists ACE inhibitors. Combination treatment may be needed in patients not controlled with one drug. Diuretics increase renal sodium and water excretion and directly dilate arterioles. This family of drugs has many side effects. Beta blockers reduce the force of cardiac contraction and renin production but they probably act predominantly via the central nervous system. Complications include aggravation of left ventricular failure, bradycardia, cold extremities, fatigue and weakness. Calcium antagonists, e.g. nifedipine, diltiazem and verapamil, are increasingly used and act predominantly by dilatation of peripheral arterioles. Side effects are few and include bradycardia and cardiac conduction defects (verapamil and diltiazem), headaches, flushing and fluid retention. ACE inhibitors, e.g. captopril, enalapril and lisinopril, block the conversion of angiotensin I to
angiotensin II which is a more powerful vasoconstrictor, and also block degradation of bradykinin which is a vasodilator.

Other agents: α-blocking agents (e.g. prazosin, doxazosin), hydralazine, and centrally acting agents (e.g. methyldopa and clonidine) may be indicated in specific circumstances. Nitrates are successful in the treatment of angina pectoris. The side effects include flushing and headache (Kumar & Clark, 1995).

Non drug therapeutic intervention is probably indicated in all patients with sustained hypertension and CHD. A review of the patients lifestyle and diet may suggest modifications that could lead to some reduction of blood pressure and angina episodes. Non-drug therapy suggested by Harrison (1998) includes, dietary management, regular aerobic exercise, and weight reduction.

Meta-analysis of previous diet studies have documented a 5 mm Hg reduction in systolic pressure and a 2.6 mm Hg reduction in diastolic pressure when sodium intake is reduced by approximately 75 m Eq/day. Caloric restriction should be urged for hypertension and CHD patients who are overweight. Reducing or eliminating alcohol intake is also beneficial.

Regular exercise is indicated within the limits of the patient's cardiovascular status. Not only is exercise helpful in controlling weight, but also there is evidence that physical conditioning itself may lower arterial pressure. Isotonic exercises (jogging, swimming) are better than
isometric exercises (weight lifting). Obese patients should lose weight. This leads to a true fall in blood pressure. Some obese patients will show a significant reduction in blood pressure simply as a consequences of weight loss.

**Psychological treatment of hypertension and CHD** includes stress management technique, behavioural, cognitive and psychoanalytical techniques and biofeedback.

Stress management encompasses a variety of techniques, and more than one is typically used in any given instance (Davison & Thompson, 1988; Lehrer & Woolfolk, 1993). Stoyva and Anderson (1982) have classified stress-management techniques as emphasizing either rest or coping. Examples of "rest" therapies include relaxation training, biofeedback and systematic desensitization. In Stoyva and Anderson's model, these techniques are seen as particularly useful in situations that produce excessive or chronic stimulation of sympathetic adrenomedullary activity (Hoffman and others, 1982). Examples of "coping" therapies include assertiveness and social skills training, modified self statements, behavioural rehearsal, and various imaging techniques. These techniques give short term benefits and do not enhance long term wellbeing.

Researchers have been able to show that hypertensives respond positively to behavioural training that involves modeling and role playing of appropriate assertiveness. As the social competence of these individuals increases, in many cases their blood pressure declines (Manuck and others, 1985); thus, strengthening the social skills of hypertensives may
prove to be of clinical value. Psychoanalytically oriented therapists employ techniques such as free association and dream analysis, as they do with other anxiety sufferers, to help hypertension and CHD patients confront the infantile origins of their fears. They encourage patients with essential hypertension, viewed as laboring under a burden of undischarged anger, to assert themselves and thereby release their anger. A variety of cognitive and behavioural techniques have been tried with Type A persons. Type A men who had already had a heart attack were less likely to have another attack if they had participated in a cognitive-behaviour counselling program after the first heart attack (Thoresen and others, 1982). Some success has been reported in modifying Type A life styles using a group therapy approach (Fischman, 1987). Cognitive behavioural techniques were shown to be effective at reducing maladaptive behaviour - such as rushing impatience, and hostility - characteristic of Type A personalities (Jenni & Wollersheim, 1979). A subsequent study by Roskies and others (1979) demonstrated greater effects for stress management with type A participants who exhibited clinical signs of coronary heart disease.

Biofeedback, in which patients are provided with prompt and exact information, otherwise unavailable, on heart rate, blood pressure, brain waves, skin temperature, and other bodily functions, is also a behavioural medicine procedure. Numerous studies have shown that most people, if given the task, for example, of raising their heart rates or lowering their blood pressure, can do so with the help of biofeedback (Blanchard, 1994; Elmore & tursky, 1978; Shapiro, Tursky & Schwartz,
1970). Aimee Christy and John Vitale (1973) of the San Francisco Veterans' Administration hospital report that biofeedback training has proven to be successful in two cases of labile hypertension. Application of biofeedback in the management of hypertension has been reported by Patel (1973). Using a biofeedback device that measured relaxation, sixteen in twenty people improved their hypertension and reduced their drug intake. Biofeedback is a costly technique, that cannot be availed by every patient. The drawbacks of biofeedback include cost and side effects.

In the present world today, we are seeing greater and greater incidence of cardiovascular disorders. A large number of people undergo severe suffering due to these pathologies, further, medication is full of hazards and side effects. The drugs we use for the treatment of hypertension and coronary heart disease have many side effects which include dizziness, depression, hypokalaemia, hyperuricaemia, impairment of glucose tolerance, aggravation of left ventricular failure, bradycardia, cold extremities, fatigue, weakness, cardiac conduction defects, headaches, fluids retention, flushing, infarction of kidney, nasal congestion dry mouth, constipation, gastrointestinal disturbances, etc. With this awareness people prefer to minimize the use of drugs and adopt some psychological interventions which brings relief to them. The psychological interventions like stress management techniques, behavioural, cognitive and psychoanalytic therapies, relaxation techniques and biofeedback are used to deal with these disorders but these techniques on their own, do not provide long term benefits to the patients of hypertension and CHD.
Meditation on the other hand is a psychological intervention that covers all these advantages, together with additional advantages. One important additional advantage is affordability. It does not involve complex equipments on attendance in clinics; after initial understanding and some practice it can be applied by the concerned person. Since it can be carried out by the patient on his/her own, it enhances the feeling of control (as opposed to helplessness). This ability to achieve an important goal without dependence on others is a major psychological advantage. Through meditation the mind becomes calmer and clarity of perception increases. Many mental switches come into the field of awareness and we learn to manipulate these. After some time we can lower our blood pressure, control sweating, aid in digestion, control heart rate, body temperature, sphincters, hormonal secretions and many other functions. Meditation relaxes mind so that when stressful situations arise you can maintain balance of the autonomic nervous system. This gives you the best view of stress and allows you to cope in the most relaxed possible way. The first step in governing the nervous system is to control the autonomic nervous system, and the means to achieve this is through the practice of meditation.

Benson and others (1974), Benson (1975), termed meditation related physiologic changes collectively the "relaxation response". This is an integrated mind-body response that, in the peripheries, includes reduction in oxygen consumption, decreased heart rate, breathing rate and blood pressure, and reduction in serum lactic acid levels, coupled with
increased skin resistance and alterations in blood flow (Davidson, 1976; Wallace and others, 1975; Woofolk, 1975; Morse and others, 1977). Many of these peripheral changes are compatible with increased arousal of the sympathetic nervous system which could be due to a decreased end organ responsivity to norepinephrine (Hoffman and others, 1982). The peripheral physiologic changes have proven to be of value as a primary or an adjunctive treatment for a variety of medical disorders such as hypertension, (Benson, 1977), and cardiac arrhythmias, (Benson and others, 1975).

Lactic acid is a chemical by-product of stress, manufactured in muscle tissue when the oxygen supply does not keep up with the work output and its oxygen need. This is not a healthy state, and lactic acid must be eliminated during periods of rest, notably during sleep. Physiological monitoring during meditation shows that there is a decrease in the activity of the sympathetic nervous system, relaxing constriction of the blood vessels. This leads to an immediate drop in blood pressure and increases blood flow to the muscles supplying needed oxygen and removing lactic acid. Researchers Wallace and Benson (1972), have shown that during meditation the level of lactic acid in the body decreases four times faster than during sleep. This indicates that meditation is more efficient in repairing physical damage associated with hypertension.

Wallace (1970), found that in sleep the level of oxygen decreased by approximately 10 per cent of the day time level, while during
meditation it decreased by 20 per cent indicating that meditation gives the body greater rest.

Although efficacy of meditation in cardiovascular disorders will be explained in more detail in the next chapter with the help of empirical evidence, at this point it appears reasonable to conclude that meditation seems to have great potential for the management of cardiovascular disorders.