Proceedings of the National Workshop cum Seminar on
ROLE OF YOGA IN PREVENTION AND MANAGEMENT OF HYPERTENSION
18 and 19 March 2010
Organized by
Advanced Centre for Yoga Therapy, Education & Research, (ACYTER)
& Department of Physiology, JIPMER, Puducherry
in collaboration with
Morarji Desai National Institute of Yoga (MDNIY), New Delhi
(An autonomous organisation under Department of AYUSH, Ministry of Health and Family Welfare, Government of India, New Delhi)

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MESSAGE

It gives me great pleasure to offer my best wishes for the grand success of the National Workshop-cum-Seminar on Role of Yoga in Prevention and Management of Hypertension being organized by ACYTER and Department of Physiology, JIPMER, Puducherry on 18 and 19 March 2010.

I congratulate the respected Director JIPMER, Dr KSVK Subba Rao for his dynamism and vision that has enabled us to start the ACYTER in JIPMER as a joint venture between MDNIY and JIPMER. I am sure ACYTER will become a centre of excellence with his supportive patronage.

I sincerely appreciate Dr AK Das, Dr S Badrinath, Dr KS Reddy and Dr Balachander for their supportive guidance as members of the ACYTER Monitoring Committee. Their support has enabled smooth functioning of the centre and the conduct of this workshop-cum-seminar.

I wish to also highlight the role played by Dr Madanmohan, Programme Director ACYTER in the formation and excellent functioning of ACYTER. I wish him all success in his efforts to integrate the ancient science of yoga with modern medicine.

Yoga has a lot to offer for the prevention and managements of various psychosomatic disorders. Recent research has proved its positive role as an adjunct and complementary therapy along with modern medicine. It can provide great relief to the suffering masses and reduce the spiraling costs of health care in our country.

I wish the workshop all success and hope that the proceedings over the next two days will shed new light on the dynamic interaction between yoga and modern medicine in dealing with the challenge of hypertension that is a challenge of great magnitude.

Dr IV BASAVARADDI

Director MDNIY, New Delhi
FROM THE DESK OF THE ORGANIZING CHAIRMAN

At the outset, I wish to express my heartfelt thanks to the Secretary AYUSH, Ministry of Health and Family Welfare, Govt. of India, New Delhi for giving me the opportunity and honour to organize this national workshop-cum-seminar on “Role of Yoga in Prevention and Management of Hypertension”. Dr. Ishwar V Basavaraddi, Director, Morarji Desai National Institute of Yoga (MDNIY), New Delhi motivated me to organize this national workshop-cum-seminar. He and the staff of Morarji Desai National Institute of Yoga have offered unconditional support to organize this workshop.

I am grateful for the encouragement to organize and support of Professor KSVK Subba Rao, Director, JIPMER who inaugurated the workshop and set the tone for its success. I thank Professor Ashok Kumar Das, Medical Superintendent, JIPMER, whose active participation in the workshop inspired the delegates. Professor S Badrinath, Project Coordinator and Professor KS Reddy, Dean have been a source of support for organizing this workshop. I am grateful to the distinguished faculty of the workshop who readily responded to my invitation at a very short notice.

I thank my colleagues and friends from the Department of Physiology, ACYTER and other departments of JIPMER who were of great help in organizing this workshop. The Organizing Secretary, Professor GK Pal made extra efforts to manage the scientific programme. Special thanks are due to Yogacharya Dr Ananda Balayogi Bhavanani, Programme Coordinator, ACYTER for coordinating the workshop and for compiling the proceedings. Thanks are due to Dr. Zeena Sanjay, SRF, ACYTER for her help in compiling and proof reading the proceedings.

It is a matter of great satisfaction that the workshop was conducted in a fitting manner and to the satisfaction of delegates and the faculty. Lectures were of high quality and demonstrations were educative and useful. The practice sessions were the highlight of the workshop and were well received by the participants, who expressed their satisfaction at being able to learn the important practices in such a short time.

I am very happy to bring out the proceedings and hope that its contents will be useful to the readers and motivate them to conduct similar seminars and workshops on various therapeutic application of yoga leading to the integration of the science of yoga with modern medicine.

Dr. Madanmohan

drmadanmohan123@rediffmail.com & drmadanmohan123@gmail.com
ACYTER and Department of Physiology, JIPMER organized a two day National Workshop-cum-Seminar on “Role of Yoga in Prevention and Management of Hypertension” on 18 and 19 March 2010 at JIPMER. The workshop was organized in collaboration with Morarji Desai National Institute of Yoga (MDNIY), New Delhi, an autonomous organization under the Department of AYUSH, Ministry of Health and Family Welfare, Govt. of India.

The workshop was inaugurated by Dr KSVK Subba Rao, Director JIPMER and Dr AK Das, Medical Superintendent, JIPMER was guest of honour. Senior faculty members from various departments of JIPMER as well as eminent yoga and medical experts from all over the country participated in the inaugural function.

Lectures, lecture-demonstrations, panel discussions and practice sessions were conducted by 24 eminent medical and yoga experts from all over the country representing JIPMER, Pondicherry; DIPAS, New Delhi; Krishnamacharya Yoga Mandiram, Chennai; Iyengar Yogashraya, Mumbai; Kaivalyadhama, Lonavla; Viniyoga Healing Foundation of India, Chennai; and the International Centre for Yoga Education and Research (ICYER) at Ananda Ashram, Pondicherry participated as invited faculty in the workshop cum seminar.

The academic proceedings were conducted at the Bernard Theatre while the practice sessions were held at the JIPMER Community Hall. 133 medical and paramedical professionals and Yoga therapists from all over the country participated in the deliberations along with medical students of JIPMER, 15 invited guests from Pondicherry and 30 faculty, residents and staff members of the department of physiology and ACYTER.

The first day of the workshop started with the inaugural function presided over by Dr KSVK Subba Rao, Director JIPMER. Dr AK Das, Medical Superintendent JIPMER was guest of honor. After the traditional lighting of the lamp and honoring of the dignitaries, the organizing chairman of the workshop Dr Madanmohan, Professor and Head, Department of Physiology and Programme Director ACYTER delivered the welcome address. Director JIPMER delivered a short and effective talk expressing his good wishes for success of the workshop. Dr AK Das in his address stressed the importance of collaboration between the ancient and modern systems of medicine for the benefit of humankind. Dr Ananda Balayogi Bhavanani, Programme Coordinator read out a message of greetings from Dr IV Basavaraddi, Director MDNIY who
wished the workshop all success. Dr GK Pal, Adl Professor, Department of Physiology delivered the vote of thanks.

The inaugural function was followed by an enlightening keynote lecture on “Hypertension and the Role of Yoga in its Prevention and Management” by Dr AK Das, Medical Superintendent JIPMER. Dr Das kept the entire audience spellbound with his oratory and gave the important message that “Your genetic tendencies are like a loaded gun. It is however in your control, whether you let the gun go off or not!”

In her invited talk, Lt. Col. Dr G Himashree of DIPAS, New Delhi elaborated on the concepts and manifestations of the stress response. She wove a detailed picture of the physiological mechanisms by which this response plays an important role in human survival. The pathogenesis of stress disorders and the methods of producing the relaxation response were explained by her in a humorous manner invigorating all participants. The session was chaired by Dr Vasudev Anand Rao, Professor and Head, Dept of Ophthalmology, JIPMER.

Dr Madanmohan, Professor and Head, Dept of Physiology and Programme Director, ACYTER explained the pathophysiology of hypertension with emphasis on the yogic perspective. He gave an excellent overview of cardiac output and peripheral resistance and their effects on blood pressure and detailed the role of the autonomic system, genetics, renin-angiotensin-aldosterone mechanisms and endothelial dysfunction. He also explained the concept of cardiogenic hypertension and stressed the importance of proper lifestyle to mitigate the development of hypertension especially in younger individuals.

The forenoon session concluded with a practice session that was conducted in the JIPMER Community Hall. Dr Madanmohan led the session on pranayama while Dr Ananda Balayogi led the session on asanas for prevention and management of hypertension. A team of yoga experts from ACYTER, JIPMER and ICYER including Smt Devasena Bhavanani, Smt Lalitha Shanmugam, Smt Meena Ramanathan, Dr Nalini Devi, Dr Zeena Sanjay, Shri Jayasettiaseelon, Shri G Dayanidy, Shri R Murugesan and Selvi Vithialakshmi assisted in the conduct of the practice sessions.

The afternoon session witnessed excellent lecture demonstration of yogasanas for hypertension by Dr Rajvi Mehta of the Iyengar Yogashraya, Mumbai. Dr Rajvi is editor of the Iyengar Yoga Journal “Yoga Rahasya” and one of the senior teachers of the Iyengar tradition. She explained
the importance of the asanas for relaxation such as janushirasana, pashchimottanasana, supta virasana and shavasana. In her demonstration she emphasized the need to develop self confidence of the patient with the use of props as per the individual needs. The importance of inverted postures in normalizing the blood pressure was also elaborated. She was assisted by Shri Bidyadhar Kar who is based in Pondicherry. All participants enjoyed the session and an active interaction with questions and answers followed.

A short talk by Professor Anantharaman of Raga’s Dental College, Chennai on yoga and hypertension was followed by a panel discussion on the role of yoga in prevention of hypertension with Dr AK Das, Medical Superintendent, JIPMER as the chairperson and Dr GK Pal, Professor, Dept of Physiology, as the moderator. The panelists were Dr RS Bhogal, Principal, GS College of Yoga and Cultural Synthesis, Kaivalyadham; Lt. Col. Dr G Himashree, DIPAS; Dr N Chandrasekharan, Viniyoga Healing Foundation, Chennai and Dr Ananda Balayogi Bhavanani and Dr Nalini Devi from ICYER. The panel discussion was informative and highly interactive as the panelists were guided by the chairperson into a detailed discussion about the causes of hypertension and the role of yoga in its prevention and management.

Following the panel discussion there was another yoga practice session that was led by Dr Madanmohan and Dr Ananda along with their teams. The practices taught in the forenoon session were reviewed and new practices added to the armory of the participants’ knowledge.

On the evening of the first day, the delegates were treated to a spectacular cultural programme that was a fusion of yogasana tableaux, Bharatanatyam compositions and instrumental music presented by Yoganjali Natyalayam under the dynamic direction of Kalaimamani Yogacharini Meenakshi Devi Bhavanani, Director of the institute. Dr Ananda Balayogi actively coordinated the performance along with Smt Devasena Bhavanani. There was also a nice performance of Vedic chanting and yogasana tableaux by children from Jeevan Prabhat, Pondicherry.

The second day of workshop started with a morning practice session on meditation and OM chanting conducted by Dr R S Bhogal of Kaivalyadham. Dr Madanmohan and the ACYTER conducted a review of the techniques taught on the first day. The forenoon session started off with an excellent key note talk by Yogacharini Meenakshi Devi Bhavanani, Director ICYER at Ananda Ashram, Puducherry who stressed on the importance of developing proper yogic
attitude as a means to prevent and manage hypertension. Ammaji is one of the world’s foremost authorities on yoga and her talk was extremely beneficial for the participants as she gave many practical examples from day-to-day life situations thus enabling all to understand the concept in a deeper manner.

This was followed by a talk on yogic management of hypertension by Yogacharya Dr Ananda Balayogi Bhavanani, Programme Co-ordinator, ACYTER, JIPMER. He explained the basic scientific concepts behind the therapeutic application of yoga in hypertension and detailed various techniques that are useful in such patients. He also added many anecdotes from his personal experiences in treating hypertensive patients with yoga therapy. Both these sessions were chaired by Dr S Srinivasan, Professor and Head, Dept of Pediatrics, JIPMER.

After the tea break, there was a lecture-cum-video presentation by Dr MR Kotwal, senior medical consultant, Govt of Sikkim. He discussed the concepts of meditation with a detailed explanation of its therapeutic benefits. The video presentation led the participants though a step-by-step practice of meditative awareness bringing about deep relaxation through meditation. Dr Kotwal actively participated with youthful enthusiasm in all the workshop sessions and was a stimulating force for all the young participants.

Dr Latha Satish, psychologist and managing trustee, Krishnamacharya Yoga Mandiram, Chennai, delivered a deeply reflective talk on the various psychological assessment methods to be followed in patients of hypertension. She brought in the yogic perspective to the psychological assessments by stressing the fact that yoga psychology has a lot to offer us in modern times. It was interesting to hear her experiences in the field of yoga and psychology that will be very useful for the participants in their clinical work.

Dr RS Bhogal, Principal, GS College of Yoga and Cultural Synthesis, Kaivalyadhama, Lonavla conducted a deeply calming experiential session on holistic meditation in the pre lunch session. He led the participants though the process of silencing the mind that could be applied even in the most stressful situations of life. The participants expressed a feeling of calmness experienced by them though the session.

The post lunch session had a talk on “Hypertension management and monitoring for complications: a physician’s perspective” by Dr Aparna Agrawal, Professor, Dept of Medicine, JIPMER. In her excellent presentation she took the participants through a detailed overview of
hypertension and its medical management with emphasis on the potential complications that must be kept in mind while dealing with hypertensive patients. The session was a mind opener for many of the yoga therapists as it would help improve their quality of patient care. The application of yoga as a therapy is best done in consultation with the treating physician as this can prevent the occurrence of potential complications. The session was chaired by Dr N Govindarajulu, Professor and Head, Dept of Physical Education and Sports, Pondicherry University.

The afternoon panel discussion on the role of yoga in managing hypertension was chaired by Dr TK Dutta, Professor and Head, Dept of Medicine, JIPMER and moderated by Dr Vivek Sharma, Assistant Professor, Dept of Physiology, JIPMER. The panelists were Dr Nalini Devi, Senior Faculty ICYER, Pondicherry; Dr Geetha Shankar, Director Yoga Studies, KYM, Chennai and Dr Ananda Balayogi Bhavanani, Programme Co-ordinator, ACYTER, JIPMER. A lively discussion about the various therapeutic modalities of yoga useful in managing hypertension and the probable mechanisms involved in such therapy held the audience in rapt attention. It was concluded that an integrated approach of yoga and modern medicine has great potential to restore the health and well being of the hypertensive patients.

The concluding valedictory session was chaired by Dr MR Kotwal of Sikkim in the presence of Yogacharini Meenakshi Devi Bhavanani, ICYER, Puducherry; Dr Himashree, DIPAS, New Delhi; Dr Madanmohan, Head, Dept of physiology and organizing chairperson; Dr GK Pal, Professor, Dept of Physiology and organizing secretary and Dr Ananda Balayogi Bhavanani, Programme Co-ordinator, ACYTER, JIPMER. Excellent feedback was received from the participants who expressed their thanks to JIPMER and MDNIY for conducting such a timely and useful workshop that is the need of the hour. The workshop declaration was read out by Lt Col Dr Himashree and the assembly passed the declaration unanimously by a show of hands. The vote of thanks was then delivered by Dr GK Pal, Adl Professor, Dept of Physiology, JIPMER and organizing secretary. He expressed his sincere thanks to the Director JIPMER, Director MDNIY, invited resource persons and participants of the workshop. He also thanked faculty, residents and staff of the Department of Physiology, JIPMER and ACYTER for their wholehearted efforts towards making the workshop a grand success. The workshop ended with the rendition of National Anthem by the participants.
Declaration of the workshop

National workshop-cum-seminar on “Role of Yoga in Prevention & Management of Hypertension”, attended by more than 200 delegates, medical professionals and students, yoga experts and discernible persons from the local town of Pondicherry, has been a grand success. The medical, psychological and metaphysical perspectives of prevention and management of hypertension have been deliberated at length and futuristic ideas and plans have also been put forth. We, the organizers, patrons, delegates and all the participants, urge the State Government, Central Government, MCI & Department of AYUSH to evolve a concrete policy for promotion of yoga as an adjunct to modern medicine so that a mass movement for yoga awareness with a sound scientific footing can be initiated.

We jointly propose the following:

1. There is an alarming rise in the incidence of hypertension including younger age groups. There is a need to have a strategy to reduce the incidence, morbidity and mortality of the disease. Also the co-morbidity of hypertension namely obesity, impaired glucose tolerance and dyslipidemia should be contained. All this can be achieved by including yoga practice as an adjunct to conventional treatment modalities. Yoga practice should be included in the school curriculum for reducing the incidence of childhood obesity, diabetes mellitus and hypertension and to improve psychosomatic health of our children.

2. For effective implementation of the above action plan, and to make yoga therapy easily available to the public, there is a need to have sufficient number of qualified yoga therapists and instructors. This capacity building should be done by designated institutes.

3. There is a need for designing specific yoga modules for prevention and management of hypertension and other lifestyle- disorders.
# FACULTY OF THE WORKSHOP

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<th>Position</th>
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<tr>
<td>1</td>
<td>Dr Aparna Agrawal</td>
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<td>2</td>
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<td>Dr N Chandrasekaran</td>
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<td>7</td>
<td>Dr AK Das</td>
<td>Medical Superintendent</td>
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<td>Yogacharini Dr Nalini Devi</td>
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<td>Dr TK Dutta</td>
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<td>11</td>
<td>Lt Col Dr G Himashree</td>
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<td>Dr MR Kotwal</td>
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<td>Dr GK Pal</td>
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<td>Dr Geetha Shankar</td>
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<td>Selvi L Vithiyalakshmi</td>
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**REGISTERED DELEGATES**

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<td>Aarthi.K, Student</td>
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**PARTICIPANTS FROM JIPMER AND INVITED GUESTS**

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ACADEMIC PROGRAMME

18 March 2010

8.00 – 9.00 AM: Registration
9.15 – 10.30 AM: INAUGURAL FUNCTION followed by high tea
11.00 AM: INVITED TALKS
   1. Key note: Dr. AK Das, Medical Superintendent, JIPMER
   2. Stress and the relaxation response- Dr. G Himashree, DIPAS
   3. Pathophysiology of hypertension: a yogic perspective - Dr. Madanmohan, JIPMER

11.45 AM: Practice session at Community Hall
   Pranayama session: Dr. Madanmohan, Shri R Murugesan, Dr Nalin Devi, Dr. Zeena Sanjay,
   Shri E Jayasettiaseelon, Smt. Lalitha Shanmugam
   Asana session: Dr Ananda Balayogi Bhavanani, Smt. Devasena Bhavanani, Smt. Meena
   Ramanathan, Shri G Dayanidy

1.30 PM: Lunch
2.30 PM: Lecture demonstration of yogasanas for hypertension- Dr. Rajvi Mehta, Iyengar
   Yogashraya, Mumbai

3.15 PM: Panel Discussion: Role of Yoga in prevention of hypertension
   Chairperson: Dr. AK Das. Moderator: Dr GK Pal
   Panellists: Dr. RS Bhogal, Dr. G Himashree, Dr. N Chandrasekaran, Dr Nalini Devi, Dr.
   Ananda Balayogi Bhavanani

4.15 PM: Tea
4.30 PM: Practice session (as in FN session) at Community Hall

7.00 PM: Cultural programme at Community Hall
   A fusion of Yoga, Bharatanatyam and Music under direction of Kalaimamani Meenakshi
   Devi Bhavanani, Director Yoganjali Natyalayam, Puducherry

8.00 PM: Dinner at Community Hall

19 March 2010

7.00 to 8.00 AM: Yoga practice session at Community hall– Dr Madanmohan, Shri R Murugesan,
   Shri E Jayasettiaseelon, Shri G Dayanidy, Selvi Vithiyalakshmi

9.00 AM: INVITED TALKS
   1. Keynote: Yogic attitude in preventing and managing hypertension- Yogacharini
      Meenakshi Devi Bhavanani, ICYER
   2. Yogic management of hypertension-Dr. Ananda Balayogi Bhavanani, ICYER
   3. Meditation and its therapeutic potential – Dr. Kotwal, Sikim
   4. Psychological assessment in hypertension: yogic perspectives-Dr. Latha Satish, KYM

11.00 AM: Lecture-cum-practical session on Holistic Meditation –Dr. RS Bhogal, Kaivalyadhama
11.45 AM: Practice session (as on 18) at Community Hall

1.30 PM: Lunch
2.30 PM: Talk: Hypertension-Management and monitoring for complications: A physician’s
   perspective – Dr. Aparna Agrawal, JIPMER

2.45 PM: Panel Discussion: Role of yoga in management of hypertension
   Chairperson: Dr. TK Datta. Moderator: Dr. Vivek Sharma
   Panellists: Dr. G Himashree, Dr. Geetha Shankar, Dr. Nalini Devi, Dr. AB Bhavanani

3.45 PM: Workshop feedback and adoption of resolution and recommendations
4.15 PM: Tea
4.30 PM: VALEDICTORY FUNCTION
COMMITTEES

Chief Patrons:

Dr. KSVK Subba Rao
Director, JIPMER

Dr. I V Basavaraddi
Director, MDNIY, New Delhi

Patrons:

Dr. Ashok Kumar Das
Med. Superintendent, JIPMER

Dr. S Badrinath
Project Co-ordinator, JIPMER

Dr. KS Reddy
Dean, JIPMER

Organizing Chairman:

Dr. Madanmohan
Programme Director, ACYTER & Professor & Head, Dept. of Physiology, JIPMER

Organizing Secretary:

Dr. GK Pal
Adl Prof. of Physiology, JIPMER

Treasurer:

Dr. P Vijayalakshmi
Adl Prof. of Physiology, JIPMER

Organizing Committee:

Dr. GS Gaur, Adl Prof. of Physiology, JIPMER

Dr. Pravati Pal, Adl Prof. of Physiology, JIPMER

Dr. Vivek Sharma, Asst Prof. of Physiology, JIPMER

Dr. Velkumari, Asst Prof. of Physiology, JIPMER

Dr. Ananda Balayogi Bhavanani, Programme Co-ordinator ACYTER

Scientific Programme: Dr. GK Pal, Dr. Nishanth, Dr. Saranya, Mr. E. Jayasettiaseelon, Mrs. Sutha

Practice Sessions: Dr. Ananda Balayogi Bhavanani, Miss. L. Vithiyalakshmi

Invitation & Registration: Dr. Velkumari, Dr. Punita, Dr. Archana, Mrs. Tamilarasi, Miss. Padmapriya, Mr. G. Dayanidy

Accommodation & Transport: Dr. GS Gaur, Dr. Senthilkumar, Mr. E. Jayasettiaseelon, Mr. Subburaman

Inaugural: Dr. Pravati Pal, Dr. Zeena Sanjay, Dr. Sebanti, Mrs. Bharati, Mrs. Selvy, Mr. P. Munisamy

Cultural Programme: Dr. Ananda Balayogi Bhavanani, Dr. Nishanth

Food, Refreshment & Cleaning: Dr. Vivek Sharma, Mr. Ramkumar, Mr. Dhandapani

Valedictory: Dr. Zeena Sanjay, Mr. Ramkumar

Accounts: Dr. P. Vijayalakshmi, Mr. S. Mourthy

Office Works: Mr Mathivathanan
BHavana: The Yogic Art of Being

Kalaimamani, Yogacharini Smt. MEENAKSHI DEVI BHAVANANI

The rishis have taught us that not only we are what we think, but also, the world is as we think it to be! Attitude is all! An essential skill in the art of yoga is the ability to create the appropriate bhavana, state of mind, towards everything, that happens to us. I myself learned an important lesson in the science of constructing positive attitudes from a very lowly creature - a fly!

While drinking a glass of fresh orange juice, something small and black swimming in the bright yellow juice caught my eye. It was a fly! I threw the juice quickly to the ground, spitting the rest out in horror. How close I had come to swallowing a fly! Then, I mused. What if I had not noticed that fly in time? What if I had indeed simply drunk it down, never knowing that I had consumed the insect? It wouldn’t have made a bit of difference to my body. My digestive juices would have taken care of it, along with the orange juice, and I would not have been the wiser! Yet, what horror and revulsion I suffered when I saw it! This ordinary incident was a major realization for me. I became fully aware of the incredible power our thoughts and consequent attitudes (bhavanas) have to alter and affect our conscious reality: the awful difference between the objective event and what we think of the event, or our reaction to that event.

Dr. Victor Frankel, an Austrian psychoanalyst, discovered his famous psychiatric treatment now known as logotherapy while interred in a German concentration camp during World War II. It was there, in a place where most lived in despair and suffering, that he underwent a spiritual transformation which illuminated his inner life. Deprived of all that he owned, separated from his loved ones, imprisoned, he discovered a freedom which none, not even the worst dictator could take away. He discovered that “the only ultimate freedom” that any human being could possess was “the freedom to choose their own attitude”. This discovery, which preserved his physical and emotional health during a time of great stress, later became the corner-stone of his famous psychological therapy.

Ashram Acharya and Director, ICYER and Yoganjali Natyalayam, Pondicherry. www.icyer.com and www.rishiculture.org
Adi vyadhi: mind over matter: Like most Western so-called “modern discoveries”, this philosophical and psychological fact had been known and utilized for untold millennia by Hindu thinkers. Adi vyadhi, the principle of the power of mind over the material reality, was taught by the rishi Vashista to his young disciple, the yuvaraja, Lord Rama, and has since been extolled by enlightened men through generations to their disciples in India.

In my own case, the near swallowing of the fly brought me to the same realizations as Dr. Victor Frankel, rishi Vashista and lord Rama, though in a much more humble and mundane way. I fully and clearly realised at that moment that what happens to us is not so important as what we “think” of what happens to us! In other words, our attitude towards the event is the determining factor of our karma. Sub-consciously, this realization had been brewing for a long time. My mother was my first object lesson. Her joy at picking and eating the first red-ripe tomato of her garden each season could not have been greater had my father presented her with a diamond ring or gold necklace! She took such delight in the changing seasons, the coloured leaves of autumn or the first snow-flake of the winter. The objects which gave her intense joy were small and common, but her delight was great. I realised then, partially, that living in a palace, wearing silks and jewels, even being ‘queen of the world’, could not have produced a greater joy in her consciousness, than the first snowflake, or the taste of that first red-ripe tomato. It was the internal state itself that was important, not that which produced it!

All events are multi-dimensional: In that same line of thought, I realised that every event is multi-dimensional in this interrelated world of phenomena. A man walks along a jungle path. A tiger eats him up. Good karma for the tiger, but bad karma for the man! In the universal scheme, one being’s pleasure often produces another being’s pain. One being’s life may demand another being’s death. We cannot change the universal scheme of things, but we can change our attitude towards it. It is told in the Jataka Tales that the Buddha in one incarnation, while walking through a forest, came upon a mother tiger starving with her two cubs. In a gesture of divine compassion, he sat in padma asana, and offered his body to the tigress as food for her and her cubs, which she accepted. What a difference between the Buddha’s attitude and the ordinary man who is eaten by a tiger!

It is taught by our yogarishis that one can change one’s karma by one’s own reaction, one’s attitude or bhavana to it. Witness the story of the devotee who approached the guru and asked him how many rebirths he would have to suffer before he would be free of the samsaric
cycle. The guru said, “You have only ten re-births left, my son”. The man walked away dejected that he would have to go through so many more bodies. Soon another man came. “Beloved teacher”, he said, “Please tell me how many births I will have before attaining moksha”. “My son”, said the guru, “You will have to be born 10,000 more times”. “Only 10,000 more births!” The man replied in ecstasy. He danced and shouted for joy. “Only 10,000 more births!” And at that very moment he became enlightened! All true spiritual freedom lies in one’s attitude towards the event, the position that the mind takes. Perhaps the event cannot be changed but one’s attitude can be changed. The attitude, the bhavana, is surely under the control of the conscious will. And circular that karma be, sometimes that very attitude has the power to alter the event.

“What shall we do? Where shall we go?” a disciple of the guru once complained to the master. “In summer it is so hot. In winter it is too cold”. The guru smiled and replied, “Go someplace where it is neither hot nor cold”. Where can that place be? Only in the mind, which simply accepts hot as hot, and cold as cold and does not react to it, calling it pleasure or pain, liking it or disliking it.

**Different levels of consciousness:** Human beings, like fish in water, live in different levels of consciousness. Though ten people are outwardly passing through the same experience, they may in actual fact, be having ten completely different experiences according to their conditioning and their attitudes! I have toured south Indian temples thousands of years old, relishing in ecstasy the most mind-boggling vibrations, viewing the most exquisite sculptures. Traveling with my students, I marveled at the fabulous temple architecture, the music and the dance, the lush green rice paddies, the graceful village women carrying brass pots on their heads which shimmered beautifully in the rays of a rising sun. Yet I have often found to my dismay that I was on a “solo” tour! My companions had a completely different experience. They suffered terrible heat, were bitten by thousands of ferocious South Indian mosquitoes, burnt their tongues with the hot spiced food and were revolted by the dirt they saw everywhere! They saw little of what I had seen, had felt little of the emotions which I had felt! Their attitudes and my attitude were galaxies apart. The external experiences were the same, but the internal reactions to those experiences were vastly different.

Another instance of the power of the mental attitude or bhavana comes to mind. In Malaga, Spain, I went daily to the market for shopping and I passed a short, fat Spanish girl, who
always sat next to a soft ice cream machine. She was there if I passed at 8 a.m. in the morning, and she was there when I returned at noon. If I happened to venture out in the late afternoon, I saw her there, talking and joking with her customers. I marveled at her cheerful disposition in such a boring occupation. I laughed to myself that she was a “prisoner of that ice cream machine.” She couldn’t move from that spot, for a customer might come, wanting ice cream. She might as well have been chained to it! Indeed, what, I thought, if she had been condemned as a punishment to sit day after day by that ice cream machine, chained by a leg to its base. She would have suffered extreme mental torture and after a few weeks, might even have gone mad. But because she had chosen to do this job, for her livelihood, day after day, of her own free will, she did it willingly, even cheerfully, laughing and joking with those who passed by, month after month. Her life was livable because of her attitude towards her situation.

**Living in the present:** The human mind also has a very bad habit of clinging to past experiences and allowing them to colour its attitude towards the present. The mind, like a hungry dog with a bone, loves to chew over and over again, the same past experience, suffering anew if the experience was painful, enjoying afresh if the experience contained pleasure. A Zen story illustrates well this human tendency. Two monks were walking down the road when they came to a young girl, standing by the side of a raging river. The girl was frightened of the river, but had to cross it to reach her home on the opposite side. The older monk picked the young girl up, hoisted her on his back, and carried her to the other bank. The two monks then resumed their walk along the path. After half an hour, the younger monk could contain himself no longer. “You know that it is forbidden to us to even go near young and beautiful girls. Yet you picked that one up and took her to the other side”. The older monk laughed and said, “I left that girl at the river side. Are you still carrying her?”

The great guru Swami Gitananda often told another story that illustrates the power of bhavana. One morning as he was walking down the street, he met a friend who was terribly unhappy and depressed. “What’s the matter, Ram?” he asked. The man wept. “My wife has just died. Woe is me! Who will look after me! Who will cook my dosas and wash my clothes? What shall I ever do! My wife is dead!” Swamiji consoled the man as best he could and sent him on his way. A little farther down the street Swamiji met another friend, Krishnamurthi, who was walking with joyful steps down the road. “Namaskar!”
Krishnamurthi greeted him with a smile, “How are you, Swamiji? I am so happy to see you!” “I am well”, Swamiji replied. “And you look very happy indeed”. “I am very happy today, Swamiji. Let me tell you why. My wife has just died”. “Your wife has just died?” Swamiji replied, somewhat shocked by his friend’s behaviour. “Yes”, little Krishnamurthi replied. “She has gone to the Lotus Feet of her Lord at last. She suffered so much these last few years from incurable disease. She was a good wife. She has served me and the children well. She has lived a good life, and now she is free”. And with these words, he went on his way. The external event was the same, the death of the wife. But in that death, one man could only think of himself and his own misery caused by the loss of his helpmate. The other man, taking a positive attitude, realized the blessings of death in the circumstances and faced his life cheerfully despite the tragedy.

Because fasting is an essential part of yoga practice in our ashram we often go without food for days. In fact, I have many times gone on twenty-one-day fasts. During those fasts I have experienced the great joy and spiritual exhilaration brought about by such a Tapas. Yet, daily, beggars approach me on the street with mournful, hungry and pitiful looks. “Amma, Amma!” they say, “Very hungry! No food today! I will die! Please give money!” They are miserable if they have to go even one day without eating! Both the beggar and I go without food, but with what a difference in our attitudes!

Hatha yoga and bhavana: Hatha yoga provides an important method for cultivating a personality capable of choosing the right attitude to take in any given situation. How can this be so? Let me explain! The English word “attitude” according to the dictionary, means “the position of the body” or “state of mind …. regarding some matter”. Funk and Wagnall’s Standard College Dictionary further explains: “attitude… is a synonym of “position”… which means location or orientation in space…. It also means a chosen point of view or opinion.” Attitude is thus closely related to “position of the body”, for the way we hold our body also indicates our attitude or state of mind. In Sanskrit, the word “asana” springs from the root “asi” or “to be”. “Asana” then reflects also a “state of being”. “Asana” in modern yogic context has come to indicate merely a gymnastic contortion of the body. But, in essence, “asana” also means “attitude” or “bhavana” or “state of being”. “Asana” reflects the “bhavana”, and also can produce the “bhavana”. Thus, it logically follows that we may use asanas consciously to help construct positive attitudes or bhavanas. The “asana” helps us to
“choose” the “correct point of view or position of both mind and body” towards every situation in our life. In hatha yoga, every possible position of which the human body is capable is explored: the body is turned upside down, bent forward, bent backward, balanced on one leg, on the hands, on the tail bone etc. The body poses are numerous and the body is made flexible, capable of assuming any position the mind requires. Since body positions reflect attitude or bhavana, a flexible body will aid in cultivating a flexible mind, one which is capable of seeing a situation from all possible angles, and then, consciously choosing the best possible position to take in regards to it! Thus bhavana, attitude and asana are intimately related, each dramatically affecting the other!

The freedom only to choose one’s attitude: Westerners critical of the Hindu cultural pattern and its rigid system of expectations and roles lose sight of the importance of one’s mental attitude in bringing about spiritual peace and joy. The Western mind constantly seeks an external paradise (either here or in the hereafter) wherein it can be happy, whereas the Eastern mind, blessed by a wiser tradition, knows that paradise lies solely within the mind. In fact, the very rigidity of the Hindu system fosters positive attitudes. For example, the Hindu attitude towards marriage has produced strong family stability. Marriages are forever in traditional Hindu culture, literally “till death do the couple part.” If one knows that one must live with one’s spouse the rest of one’s life and that there is no alternative, certainly one’s attitude towards him or her will be much different, than if one knows that one can easily leave him or her any moment for any reason whatsoever!

If one exists in a structure which cannot be changed, even if the resultant situation is intolerable, then one must either change one’s attitude or die or go insane or run away. There is a beautiful prayer to this effect: “Lord, grant me the strength to change that which can be changed, the patience to accept that which cannot be changed, and the wisdom to know the difference!” This was the great prayer which Victor Frankel learned during his years in a concentration camp. This, of course, also requires great faith in the Universe and wisdom enough to perceive the situation accurately. One must believe, or know, that every situation into which one is placed is exactly the situation needed for one’s growth, for one’s further evolution. In Patanjali’s system of yoga, this bhavana or attitude is the fifth niyama and is called ishwar pranidhana, or submission to the will of the Lord, accepting all conditions as a prasadam from God. That is the essence of the yogic attitude towards life. That is also the
essence of Christ’s “be-attitude”, or the correct attitude towards being. Every event, every relationship, every situation, pleasant or unpleasant, becomes a means through which one can evolve, through which one can grow spiritually. When one is over the “hump” of seeking for external paradises, of seeking a place to rest which is neither too hot nor too cold, when one realizes that that ideal place exists only in his own mind and in a positive attitude towards the Universe, then one is walking firmly on the spiritual path. One understands that heaven (or hell) lies within our own minds.

Goldie Meier, the former Prime Minister of Israel, was once asked the secret of the immense power of her small nation’s survival under such hostile conditions. She thought for a few moments and then said simply, “Our strength stems from the fact that we have no alternative”. Indeed, when one has no alternative, anything is possible. When one allows oneself no excuses, one can achieve the impossible. When in an impossible situation, when in a corner backed to the wall, when there is no escape, it is then and there that the positive attitude can change a coward to a hero, a weakling to a man of strength, and failure to success.

I am always grateful that on that day I didn’t swallow that fly. Not that it would have made any difference to my vegetarian body. Surely that little insect could have been easily digested and I, none the wiser. But that incident with the little fly became the culmination point in a chain of thinking that had begun long before in childhood musings. It was the straw that broke the back of a false conditioning and in a single stroke, I found myself freed into a realm of consciousness in which every experience was welcomed as another opportunity for evolution. Cold or hot, pleasant or unpleasant, success or failure - all this became totally irrelevant. It was that lowly fly which taught me the true meaning of the beatitude and gave me the correct bhavana, the yogic attitude, towards ‘being’.
STRESS AND THE RELAXATION RESPONSE

Lt Col G HIMASHREE

Introduction: The relation of stress to health and illness is of scientific interest. However, approaches to it have differed widely among the various scientific disciplines, especially between the social and biomedical sciences. The body is a self-regulating system. There are threats to the body's equilibrium as its environment changes and as the organism grows. These threats can be responded to, adaptively by appropriate action, or destructively by inappropriate action. The key to self-renewal lies in the level of awareness of threats, and the strategies available for dealing with them.

Stress constitutes a central concept, some broad working definition is indicated. As a first attempt it may be said that stress is an intermediate response or output of a psychobiological process within an organism due to inputs called stressors, events that are perceived as stressful. Stress is often defined as the response of the human organism to any change or demand, be it internal or external, the stress response automatically initiates.

Stressors therefore tend to produce stress, but may not necessarily do so. Stressors can be simply biological (physical trauma, such as a cut, burn, break or fracture) or psychological (fear of failure, an insult, or a promotion threat of expectation of future bodily or social harm). Stressor can vary widely, depending on factors like personality, gender, age, experience and social status.

History: Since the days of René Descartes, the seventeenth-century mathematician, Western science has followed the doctrine that the mind and body are separate. Today, thanks to Hans Selye, we are now well aware that emotions and the mind play a critical role in our physiological responses, though many doctors still practice medicine as if they were separate. In the 1930s, Selye was an assistant professor attempting to do some research on rats to determine the effects of an ovarian extract. He would try to inject the rats, but would end up dropping them on the floor, chasing them around the room, and finally injecting them with the extract. At the end of several months of this, Selye found that the rats had peptic ulcers, greatly enlarged adrenal glands (the source of two important stress hormones), and shrunken immune tissues. As in all good research, he ran a control group and injected rats with just

Professor and Head Dept. of Physiology, ACMS and OSD, DIPAS, New Delhi
saline solution. He was surprised to find the same symptoms. Clearly, the physical problems
were not the result of the ovarian extract. Selye thought about his treatment of the rats and
reasoned that perhaps there were changes in the rats’ bodies as a result of the traumas they
had to suffer under his handling. To test this during the winter, he put some on the roof of the
research building and some in the boiler room; some were forced to exercise, and some
underwent surgical procedures. All of the rats developed peptic ulcers, adrenal enlargement,
and atrophy of the immune tissues. He borrowed the engineering term – *stress* to describe the
phenomenon. He made two observations:

• The body has a set of similar responses to a broad array of stressors.

• Under certain conditions, the stressors will make you sick

In fact, this general type of phenomenon had been identified 10 years earlier by a Harvard
University physiologist, Walter Cannon, as the “fight or flight response”. Cannon theorized
that mammals have a physical ability to react to stress that evolved as a survival mechanism.
When faced with stressful situations, our bodies release hormones - epinephrine (adrenaline)
and norepinephrine (noradrenaline) that elevate the heart rate and increase blood flow to the
muscles, gearing our bodies either to do battle with an opponent or to flee. Today our
knowledge of the stress response has been refined further through the advancements made in
technology and science, but the basis of our understanding still confirms the theories of these
two “fathers of stress”.

**The physiology of stress:** As noted above, the body has a similar set of responses to a broad
array of stressors. These responses include:

1. Rapid mobilization of energy from storage. Glucose, simple proteins and fats pour out
   of fat cells, liver, and muscles.

2. Increased heart rate, blood pressure, and breathing to speed up the transport of
   nutrients and oxygen.

3. Inhibited growth and decreased sex drive. Females are less likely to ovulate or to
   carry pregnancies to term. Males secrete less testosterone and suffer erectile
dysfunction.
4. Halted digestion. The large intestine is stimulated to release previously digested food to reduce body weight.

5. Inhibited immunity to save the body’s energy for the crisis at hand.

6. Diminished perception of pain.

7. Improved cognitive and sensory skills. Memory improves, except in the case of prolonged or extreme stress.

All of these responses are meant to be short-term in order to mobilize the body for action. They are short-sighted and inefficient, but they are important in a physical crisis situation. They evolved over the millennium when threats tended to be predators chasing us to eat us. To a great extent, these physiological responses are completely useless in the context of giving a speech, hearing disturbing news on TV, or handling spiralling health care costs. These types of stressors have arisen only within the past few centuries; therefore, we have not had enough time to evolve biologically to cope in new ways. “Modern” stressors are no longer short-term; they have become chronic. The risk of disease has increased as a result. So, it is up to us to understand what is happening in our bodies when we experience stress and to learn to deal with it in a way that causes as little damage as possible.

**Hormones of the stress response:** The autonomic nervous system controls bodily functions which we are largely unaware of and do not consciously control. The part of the autonomic nervous system that is activated during emergencies is the *sympathetic nervous system*, which speeds up systems needed for survival. The other part of the autonomic nervous system, the *parasympathetic nervous system*, plays an opposing role. It mediates passive activities and promotes growth and energy storage. Parts of this system are also called into play during stress to slow down systems not required for survival.

When something stressful happens or you think a stressful thought, many hormones are released by the brain, nervous system, and other organs:

- The base of the brain, the hypothalamus, secretes an array of hormones into the blood, mainly corticotropin releasing factor, which triggers the pituitary to release the hormone corticotropin (ACTH) that in turn triggers the release of glucocorticoids by the adrenal gland.
• The sympathetic nervous system releases epinephrine (adrenaline), and norepinephrine (noradrenaline) into the bloodstream.

• The pancreas releases a hormone called glucagon, which raises the circulating levels of glucose in the blood.

• The pituitary releases prolactin, suppressing reproductive systems and vasopressin, the anti-diuretic hormone

• Both the brain and the pituitary release morphine-like substances called endorphins and enkephalins which limit pain perception.

Epinephrine and glucocorticoids appear to act in similar ways. However, epinephrine acts within seconds while glucocorticoids are slower-acting, backing up the epinephrine for minutes or hours. Together, epinephrine, norepinephrine, and the glucocorticoids account for a large portion of what happens in the body during stress.

At the same time, the secretions of the reproductive hormones (estrogen, progesterone, and testosterone) and the growth hormones are inhibited during stress to conserve energy for the imminent fight or flight. The secretion of insulin is also inhibited, which normally tells the body to store energy.

The pattern of the body’s response to stress is not consistent. Massive physical stressors result in hormonal changes, with the glucocorticoid and epinephrine/norepinephrine response being the most reliable. More subtle stressors result in a variety of responses. For example, anxiety and vigilance types of stress may result in the release of epinephrine and norepinephrine, while depression and giving-up types of stress may result in the release of glucocorticoids.

Depending on the anticipated type of stress, the psychological context of the stressors causes the release of these hormones and other chemicals, collectively called peptides. Peptides are strings of amino acids that are the means of communication within and between all parts of the body. They are detected by receptors in different parts of the body, which results in changes to those body parts. The peptides and their receptors are considered the biochemical correlates of emotions.
An underlying, unifying idea is that stressfulness results when the organism is required to adapt to change, whether the change is physiological, psychological or social. However, because the stress response always involves biological mechanisms, the definition evolved for stress by the pioneer researcher Hans Selye is worth nothing: “Stress is the nonspecific response of the body to any demand made upon it”.

The concept of stress comprises the following:-

- One or more inputs perceived as a threat to the organism’s wholeness, viability, security or equilibrium.

- A process of mobilizing resources designed to counter the threat to adapt to the changed conditions or to re-establish equilibrium; typically involving several stages, such as initial alarm, sustained resistance and possibly eventual failure.

- An output condition of successfully re-established equilibrium, often with acceptance of the adaptations that may have been involved.

**Physiological stress response:** The physiological stress response is initiated in the hypothalamus and limbic system either through neural signals arriving from other areas of the central nervous system (CNS) to signal a perception of the need to respond to a stressor or from feedback signals arriving from other target systems in the body that have been affected by the physical stressors.

The hypothalamus, a small organ weighing about 5 grams, is in a region called the diencephalons which regulates the emotions-fear, hate, passion, anger and happiness. It is itself a strong pleasure (reward) centre. This region also controls the essential housekeeping functions of the body and in particular some are performed in the hypothalamus itself such as thermoregulation, hunger-satiety-feeding control and gastrointestinal stimulation. In addition, the hypothalamus either controls or at least mediates the three systems that together primarily implement the stress response: the autonomic nervous system, the hormonal or endocrine system and the immune system.

**The autonomic nervous system:** The autonomic nervous system (ANS) comprises the sympathetic and parasympathetic nervous systems which together largely control the visceral organs. It is the fastest acting component of the overall stress response and therefore initiates the alarm reaction phase. The sympathetic system is of most obvious importance in stress
response because it produces the characteristic features of the fight-or-flight response, i.e.,
increase in heart and respiratory activity, basal metabolism and “fuel” supply and mental
arousal, tense trunk state and contracted leg flexors; vasoconstriction of peripheral circulation
and shutdown of the gastrointestinal and feeding systems. In contrast, the parasympathetic
system tends to relax both smooth muscles and the cardio-respiratory system and increases
the gastrointestinal system’s activity. It therefore provides the basis for a mirror image to the
fight-or-flight response, namely the relaxation response (Benson 1975; Pelletier 1977). It
should be noted that the neuroendocrine system of the adrenal medulla is often included as an
integral part of the ANS. Hypothalamic neural stimulation of this organ causes secretion of
the hormones adrenalin (epinephrine) and noradrenalin (norepinephrine). Adrenalin
essentially reinforces the direct neural actions of the sympathetic system already described,
but being hormonal, it functions more slowly and acts as longer term reinforcer.

The hormonal (endocrine) stress response: The pituitary gland (hypophysis), stimulated by
the hypothalamus, is a major regulator of the endocrine system. The anterior lobe activates
the most studied and important pathway, that of ACTH to the adrenal cortex and thence via
corticosteroids. Of primary importance is the mineralocorticoid aldosterone, which among
its many effects tends to increase blood volume, cardiac output, blood pressure and cellular
metabolism. Because these functions assist the inflammatory aspect of the immune response,
aldosterone is called a pro-inflammatory hormone. It tends to be associated with chronic
stress and can result in kidney damage. The second major corticoid, cortisol is a
glucocorticoid that increases blood concentrations of glucose, amino acids and free fatty
acids and thus mobilizes for tissue repair. It has an anti-inflammatory role. The further
pathway from the anterior pituitary via the thyroid produces thyroxine that also generally
facilitates defense systems.

The immune response: This third arm of the stress response has as its primary function
identifying of “non self” materials within the “self” and then taking appropriate action. In
terms of the invader-host model, its passive “moat and wall” aspect corresponds to the skin
and gastrointestinal boundary, the defending “soldiers-on-the-wall” analogy corresponds to
the various chemical and microbial defenses at the skin. From experimental work with
animals, Stein et al. concluded that the role of the hypothalamus in immune response is
probably mediated through the autonomic nervous system and neuro-endocrine system as
well as directly. Stress problems arise, however, if the anticipated need to respond is mobilized and released at an unnecessary high level as an over-reaction.

**Stress-response patterns:** Some frequently encountered patterns are representative of the main effects; and are well introduced by Selye’s general adaptation syndrome (GAS). From Selye’s long studies in stressing animals, the omnipresent signs of damage were enlargement of the adrenal cortex, atrophy of the thymus, spleen, lymph node and all other lymphatic tissues and deep bleeding gastric ulcers. The GAS described by Selye has three time phases:

1. **Alarm phase:** The sympathetic system primarily initiates this response which is an “all-stations” undifferentiated alarm. Reinforcement follows through the adrenalin-noradrenalin system and then through the main endocrine axis involving the pituitary.

2. **Resistance phase:** The alarm stage is too expensive for the organism to maintain, even if it could remain effective and the resistance stage follows. During this stage the adrenal cortex operates at a faster rate, recharges its depleted corticoid stores.

3. **Exhaustion phase:** If the stressor continues indefinitely the defense mechanism involved become exhausted. Selye believes that the available “adaptation energy” is finite and so is used up. Implicit in our description of the stress-response mechanism is the concept that there is an alternative way to treat the stressor other than the “fight-or-flight” path, namely to decide after careful assessment the invader does not really represent a significant threat to the organism’s viability. For instance, it may be a better strategy to tolerate the invader and perhaps even in due course to colonize it or win it over. Selye calls these responses catatoxic and syntoxic, respectively.
Physio-psychosocial stress response: This is another process of the organism’s psychosocial dynamics. This refers to the vast spectrum of processes in which we are involved e.g., home and work environment, educational, social and political institutions; recreational and religious activity; as well as hospitals and other health care institutions.

Relaxation response: The relaxation response is defined as the individual ability to release chemicals and brain signals that make muscles and organs slow down and increases blood flow to the brain. It is perhaps one of the most important skills to gain control over the body. Research on the relaxation response has shown that it can increase energy, decrease fatigue as well as increase arousal from a drowsy state. It can increase motivation, productivity, and improve decision-making ability. The relaxation response lowers stress hormone levels and lowers blood pressure. Drugs can cause relaxation, but they often have unwanted side effects. To be physically relaxed and mentally alert is the goal of the relaxation response.

The relaxation response is not:
- Lying on the couch
- Sleeping
- Being lazy

The relaxation response is:
- A mentally active process that leaves the body relaxed
- Best done in an awake state
- Trainable and becomes more and more profound with practice

The relaxation response can be achieved by: Some of these techniques are called:
- Progressive muscle relaxation (tense & relax)
- Visual imagery
- Deep breathing
- Meditation
- Hypnosis
- Yoga
- Biofeedback
The relaxation response can significantly:

- Decrease pain
- Increase energy
- Decrease muscle tension
- Increase motivation
- Decrease irritability
- Improve sleep
- Enhance productivity
- Lower blood pressure
- Lower stress hormone levels
- Increase arousal from drowsy state
- Improve decision-making ability
- Reduce fatigue
- Decrease anxiety

The relaxation response by Herbert Benson:
The relaxation response is a simple practice that once learned takes 10 to 20 minutes a day and can help relieve stress and tension. Learning and putting into practice such techniques can significantly improve your mental, emotional and physical health. This technique was developed by Herbert Benson, M.D. at Harvard Medical School, and is taken from his bestselling book "The Relaxation Response". To learn this technique, set aside 10 or 20 minutes each day for a week and try it.

1. Sit quietly in a comfortable position.
2. Allow your eyes to close.
3. Think about each muscle, beginning at your feet and progressing up to your face. Deeply relax all your muscles. Keep them relaxed.
4. Breathe through your nose. Become aware of your breathing. As you breathe out, say the word, "ONE", silently to yourself. For example, breathe IN ... OUT, "ONE",- IN .. OUT, "ONE", etc.
5. Breathe easily and naturally.
Conclusion: Stress is a necessity for the survival of individual. It is a well orchestrated physiological response involving complex programmes of autonomic nervous system, endocrine system and immune system. However the cortical control to modulate the stress response cannot be ruled out. After every stress reaction of the body there is a relaxation response, the main objective of which is to replenish resources and make the individual ready for the next stress response. This relaxation response can be well modulated with certain practices and thereby minimize the deleterious effects of chronic stress.
ROLE OF YOGA IN PREVENTION OF HYPERTENSION

Dr N Chandrasekaran

The role of yoga in health management is a very well established fact. Its efficacy in the preventive part of health management needs no assertion. Yoga Sutra, the most authoritative text on yoga, is emphatic in its declaration, “heyam duhkham anagatam”, which means ‘all the future sufferings can be avoided’.

Preventive medicine is mostly all about don’ts. If we take care of the don’ts, we prevent many diseases. For e.g., to prevent hypertension from occurring, do not add much salt, do not take much oil rich food, do not smoke, do not drink alcohol, do not add extra weight, do not be lethargic, etc.

Yoga also follows the same principle. It also says, “For yogam to happen, the first step is viyogam”. Viyogam means what is to be avoided.

Here we will discuss about the don’ts in yoga practice that are to be followed for the prevention of hypertension.

1. Do not tighten your muscles during asana practice

Many people practice yoga keeping their muscles tight – as if they are doing some strenuous exercises. It is to be avoided. This achieves two fold benefits:

1. In people with hypertension or pre-hypertensive, one can see persistent tightness in their muscles. This leads to increased arteriolar resistance which in turn leads to increased blood pressure. During asana practice, if we tighten the muscles it is going to aggravate the already existing tightness. So we should keep our muscles relaxed. This reduces the end arteriolar resistance, thereby preventing hypertension.

2. According to yoga texts, complete and comprehensive health means uninterrupted prana flow to every microscopic part of our constitution. If the prana is blocked, that part of the body gets ailment. In this connection, we should consider the relationship between endothelial damage and the blocked prana supply. So, if we tighten our
muscles during asana practice, the prana flow will be blocked leading to complications. It is essential that we are relaxed during asana practice.

2. **Do not compromise breathing during asana practice**

There are certain asana postures which by the very positioning of different parts of body in a particular way cause the following:

1. Increased intra-abdominal pressure.
2. Restricted diaphragmatic movement.
3. Strained breathing that short and shallow.
4. Increased pulse rate due to faster breathing.
5. Increased pulse rate indicates cardiac strain leading to increased blood pressure.

Examples:

So, if we want to avoid any cardiac strain and to prevent blood pressure, we should avoid all asana techniques which will compromise our breathing.
3. **Do not allow stress to get accumulated**

Stress is one of the most important precipitating and aggravating factors for hypertension. For most of the people, the stress gets gradually accumulated over a long period of time, before it manifests as an established pathological condition.

In the case of hypertension, this gradually accumulating stress causes:

1. Initial fluctuating blood pressure response.
2. Gradual elevation in the basal blood pressure.
3. Over a period, fully established hypertension ensues.

Yoga has many powerful tools to release the constitution from stress at all levels.

- Stress at the **physical** level is manifesting as tightness of the muscles, stiff upper back and nape region, mild curvature in the torso, etc.
- Stress at the **physiological** level manifests as short and shallow breath and increased pulse rate.
- Stress at the **psychological** manifests as lack of focus, irritability, loss of memory, anger, short temper, etc.
- Stress at a **deeper** level manifests as lack of confidence, mood swings, personality changes, etc.

So, to release the system from this accumulated stress, we need to practise yoga every day, and for a long period of time.

Ideally these practices should be done in the evening before dinner. So, the onslaught on the constitution due to our day to day stress from work and life situations, are released on that particular day itself.

With a good night’s sleep, we are ready and fresh for the following day’s onslaught.
Some of the postures to release the physical stress:

To release the physiological stress:

1) IN 1 2 3 4……Max
   EX 2 4 6 8……Max

2) IN free
   EX max 6 to 12 breaths

Exhalation brings relaxation of the physical, physiological and psychological systems

To release the psychological and deeper stress:

Some of the techniques that can be applied are:

1. Sitali pranayama
2. Chanting
3. Japa
4. Meditation

4. Do not allow fire in the abdomen to smoulder
According to yoga texts, there is a fire in our abdomen called **jatharagni**. This fire is responsible for digestion, assimilation and all metabolic activities. If the intensity of this fire is reduced, it will result in impaired digestion, poor assimilation and metabolic imbalances. This in turn results in accumulation of poorly metabolised waste products all over the body. For example: accumulation of cholesterol in the system, one of the contributory factors for the development of hypertension.

The concept of **jatharagni** can in a way be equated to the function of the liver. Proper liver function ensures proper metabolism. Thereby no metabolic waste products are accumulated in the system resulting in diseases.

There are a number of techniques in yoga to improve the function of Jatharagni – to improve liver function. This will ensure proper maintenance of health thereby preventing many diseases from manifestation.

Some of the techniques that can be applied are:

5. **Do not allow the lower abdomen to bulge and hang out**

The part of the abdomen below the navel region is called “**apana**”. According to yoga texts, apana is the region where physical, physiological, psychological and deeper dross are being collected. Bigger the bulge in the lower abdomen, more the accumulation of waste products leading to diseases. A flat and strong lower abdomen signifies youth, vitality and health.
Some of the yoga techniques that can be used to strengthen the lower abdomen are:

Mahamudra with the following breathing ratio:

<table>
<thead>
<tr>
<th>IN</th>
<th>HOLD</th>
<th>EX</th>
<th>HOLD</th>
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<tbody>
<tr>
<td>1</td>
<td>0</td>
<td>2</td>
<td>1</td>
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Note: The techniques of yoga that were discussed above should be applied according to the individual and under proper guidance.
HYPERTENSION AND ITS YOGIC MANAGEMENT

Yogacharya Dr Ananda Balayogi Bhavanani

Introduction: One of the most common health disorders prevalent today is hypertension or high blood pressure. This occurs when pressure inside the blood vessels is higher than the normal expected values for age and gender. Yoga, when adopted as a way of life, has a lot to offer for those suffering from this stress-induced psychosomatic lifestyle disorder that is a silent killer. Various studies by Datey, Madanmohan, Vijayalakshmi, Patel, Murugesan and Selvamurthy have shown the potential of yoga as an effective preventive measure as well as adjunct therapy for hypertension.

Diagnosis: Hypertension should be diagnosed only after taking several readings. The blood pressure needs to be taken at least two times, and each reading must be from a different day. If the average of these blood pressure readings is more than 140/90, hypertension can be diagnosed. A single reading that is more than 140/90 doesn't necessarily confirm hypertension but requires further monitoring.

Etio-pathogenesis: The primary cause of the hypertension is not identifiable in 90% of patients, hence known as "primary" or "essential" hypertension. Most of these patients have no clue to their condition as there may not be any symptoms – giving it the name "the silent killer." Even when symptoms are noticeable they are vague like blurred vision, dizziness, headache, and nausea. Unfortunately, by that time, serious damage may have already occurred in blood vessels, heart, eyes, brain, or kidneys.

In less than 10%, the cause of the hypertension is known and so therefore, is called secondary hypertension. Conditions that can cause secondary hypertension include pre-eclampsia, endocrine disorders, coarctation of the aorta, kidney disease, sleep apnea and medication such as birth control pills. Risk factors for hypertension include being overweight, having diabetes, being a male over the age of 45 (or a female over 55), being of African American descent and eating a lot of salty foods. Hypertension is worsened by smoking, excessive

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alcohol consumption, prolonged and poorly managed stress, a diet high in fat and/or salt and lack of exercise.

Shockingly, this author has found that many doctors start their patients on antihypertensive medication after taking just a single isolated reading. This is quite disheartening, for once you start someone on anti-hypertensive medication it is then usually a lifelong affair. The baseline understanding to be developed is that you need to be checked at least on two or more different occasions before starting medication and first line of treatment should be lifestyle modification and not drugs.

**Risks associated with hypertension:** Health problems in the hypertensive don’t occur over days, weeks, or even months but are rather found to occur over many years and affects nearly every part of the human body. By adding strain to walls of the blood vessels, hypertension makes them more likely to develop atherosclerosis with a buildup of fat and cholesterol and "hardening" of arteries that in turn puts extra strain on the heart as it pumps blood through the narrowed arteries. Over a period of time, this increases the risk of heart disease, stroke, heart attack as well as eye and kidney damage.

**Managing a patient of hypertension:** The initial strategy in managing hypertension should always include a dynamic advocacy of lifestyle modifications. However in patients whose BP is on the higher side, medications will need to be taken along with lifestyle modifications until their condition stabilizes.

The aim should be to lower the blood pressure as close to the normal range as possible. Many therapists seem to forget that lifestyle changes are the first step in hypertension treatment. These changes can also improve quality of the patient’s life as well.

We shouldn’t be impatient as it may take three to six months before full benefits of lifestyle modifications begin to manifest. These lifestyle modifications include exercising regularly, losing weight, reducing salt consumption, changing over to a heart healthy diet and drinking less alcohol. We must always remember that the control of hypertension requires a lifelong commitment irrespective of whether medications are used or not.
Major lifestyle modifications needed to treat hypertension defined in the Seventh Report of the Joint National Committee on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure (JNC 7) and the World Health Organization-International Society Hypertension (WHO/ISH) guidelines are given in the table above.

Yoga however takes a more detailed view of hypertension and hence the prevention as well as management of hypertension from the yogic point of view will be discussed below.

ADOPTION OF A YOGIC WAY OF LIFE

Tiruvalluvar the great dravidian mystic says in his 1330 versed Tirukkural, a treatise on right living, “Look for the disease, look for the primary cause of it and then treat it” (Noimaadi noimudhal naadi athuhanikkum vaa naadi vaippach cheyal:Tirukkural, 948). Most modern doctors and even yoga therapists seem to have lost their way in the maze and are content managing the manifest symptoms without understanding the real cause.

Yoga aims at enabling the individual to attain and maintain a dynamic sukha sthanam that may be defined as a dynamic sense of physical, mental and spiritual well being. The Bhagavad - Gita defines yoga as “samatvam” meaning that yoga is equanimity at all levels. (Yogasthah kurukarmani sangam tyaktva dhananjaya, siddhiasiddhyoh samobhutva samatvam yoga uchyate. Bhagavad Gita 2: 48). This may be also understood as a perfect state.
of health wherein physical homeostasis and mental equanimity occur in a balanced and healthy harmony.

**Cultivation of right attitudes:** The most important part of managing hypertension is cultivation of right attitudes by the development of yogic attitudes towards every part of life. This is vital to reduce the stress that is more often an inner over-reaction than the response to any external stimuli. The attainment of clarity of mind (*chitta prasadhanam*) through the attitudes extolled by Maharishi Patanjali (*maitri, karuna, mudita, upekshanam*) is to be inculcated by the therapist. The importance of taking the opposite view towards negative thoughts and actions (*pratipaksha bhavanam*) as well as emphasis on the cultivation of karma yoga, raja yoga and bhakti yoga principles in daily life needs to be emphasized.

**Healthy, heart-friendly diet:** It is important to have a diet that is of a healthy nature. Meals should be taken regularly and there should be adequate amounts of green vegetable salads, fresh fruits juice and sprouts. There should be the minimum possible amount of salt in the diet as salt leads to water retention and a rise in BP. The diet should have adequate potassium and calcium that are present in fruits and low fat dairy products. They help to reduce the BP and fruits are also an excellent laxative too. It is important to maintain good hydration and therapists need to stress that a loss of a few kilos of body weight will help reduce the BP too!

**Breath-body movement coordination practices:** Practices that enhance mind-body harmony through the use of “breath linked movements” should be emphasized. Sukshma vyayama and shithilikaran vyayama practices as well as the enjoyable jattis of the Gitananda tradition are useful in this regard. Surya namaskar done slowly with breath awareness can also produce psychosomatic harmony and the postures can be held without strain for a short period with meditative awareness of the surya mantras (names of the sun).

**Yoga-asanas:** Modified versions of the following asanas as per physical condition and other associated health problems of the patient may be used. Standing postures such as tada asana, trikona asana, padottana asana, hastapada asana, padangushta asana and meru asana are useful. Prone postures that are of benefit include bhujanga asana and ardha-shalabha asana while useful sitting postures include vakra asana, gomukha asana, ushtra asana, shashaha
asana and yoga mudra asana. The supine postures include matsya asana (variations I and II), pavana mukta asana and eka and dwipada uttanpada asana. Topsy turvy postures may help in resetting baroreceptor reflex mechanisms that regulate blood pressure. This may also be achieved by ‘head-below-heart’ postures that do the same if the patient cannot do postures like sarvanga and setubandha sarvanga asana.

**Pranayamas:** Vibhaga and pranava pranayama with emphasis on madhyam pranayama are beneficial as also chandra bhedana and chandra nadi pranayamas that help reduce sympathetic over activity. Savitri, nadi shuddhi (aloma viloma in the Gitananda tradition) and brahami pranayama are excellent practices to reduce stress. Pranayamas such as sheetali and sitkari also produce a sense of relaxation.

**Shat kriyas:** For patients who are able to do them, cleansing practices such as jala neti and trataka clear up the head and neck region producing a sense of lightness by reducing toxic accumulation in this region.

**Mudras:** Viparita karani, shanmukhi mudra and brahma mudra are all useful in various ways. Viparita karani helps by virtue of being ‘head-below-heart’ and also has a profound effect on the psycho-neuro-endocrine axis. Shanmukhi mudra produces a sense of inner calm while brahma mudra by virtue of working with breath and vibration (nada) induces a sense of
relaxation and reinvigoration in the head and neck region that reduces stress and normalizes the reflex mechanisms.

**Yogic relaxation:** Hatha yoga relaxation practices that can be done from shavasana include spanda nishpanda kriya (alternate tension and relaxation), marmanasthanam kriya (part by part relaxation) and kaya kriya (dynamic body relaxation). Jnana yoga relaxation practices such as anuloma viloma kriya and yoga nidra can help reduce stress levels and create psychosomatic harmony. Even simple makara asana offers an excellent antidote to stress and benefits the patients of all psychosomatic disorders.

**Dharana and dhyana:** Concentration practices that induce a state of meditation include the popular om japa and ajapa japa. Chakra dhyana is another useful practice while mandala dharana may be done on all chakras with special emphasis on anahata chakra to harmonize prana vayu that is based in the heart region.

**Yogic counseling:** This is a vital component of yoga chikitsa when dealing with any lifestyle disorder as yoga is basically a preventive life-science (*heyam duhkham anagatam*- Yoga Darshan 2: 16). The counseling process is not a ‘one off’ matter but is a continuous process that starts from the very first visit and continues with every session at different levels.

**Conclusion:** Helping the patients understand their condition, finding the root cause of the problem and creating a healthy opportunity for them to change themselves, is the dharma of the therapist. Ammaji, Yogacharini Meenakshi Devi Bhavanani has defined dharma as doing the right thing for the right person at the right place and at the right time in the right manner. It may take many months before we start to witness benefits of these yogic lifestyle changes and yoga chikitsa practices. We must continue to motivate the patient (and ourselves too!) to keep up their and efforts without allowing any slackening to occur. It all may seem to be a ‘big asks!’ but it is necessary to do all of this if we want to practice yoga chikitsa. Otherwise please remember it is merely yogopathy, the suppression of symptoms though yoga and not yoga chikitsa!

**Recommended Reading:**


IYENGAR YOGA FOR MANAGING HYPERTENSION

RAJVI H MEHTA

**Introduction:** Hypertension (HT) is becoming a major public health issue all over the world. Kearney et al (2005) reported the astonishing fact that nearly $\frac{1}{4}$th of the adult world population suffered from HT in 2000. As often thought, this is not merely a lifestyle disease of the ‘developed’ world, because of the estimated 972 million adults suffering from HT, 333 million were from the economically developed world and 639 million from the developing countries. It is predicted that by 2025 the number of adults with HT will increase by 60% to a total of 1.56 billion. Such staggering figures are indeed a cause for concern as patients with HT are at a high risk of life threatening diseases like stroke, cardiovascular disease and kidney diseases.

India too is a part of this international trend in the rise in the prevalence of HT. Serial epidemiological studies in 1994, 2001 and 2003 demonstrated a rising prevalence of HT (30%, 36% and 51% respectively) in males and 34%, 38% and 51% respectively among females (National cardiovascular database).

While changing lifestyles is considered to be one of main causes for the increasing prevalence, more and more people, the world over, are also altering their lifestyle to manage and control HT. Patients with HT are asked to increase physical activity, initiate dietary restrictions and lose weight. The BP does drop initially, but soon reverts back and furthermore, individuals find it difficult to sustain their ‘modified’ lifestyle. Many individuals are now incorporating yoga into their day to day life as an adjunct to conventional medical therapy to manage HT. This article discusses the approach that is being used in ‘Iyengar Yoga’ to manage HT.

**What is Iyengar Yoga?** ‘Iyengar Yoga’ is a term which is used to distinguish the teaching methodologies used by disciples of Yogacharya BKS Iyengar. Although, it is imperative to note here that Yogacharya Iyengar himself clearly states, “There is nothing like Iyengar Yoga. Yoga is one as God is one. But learned people identify God in various forms and ideas according to their thoughts. Yoga too has been identified with various names.”

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*Editor Yoga Rahasya and Research Associate, Iyengar Yogashraya, Mumbai*
One of the unique features of Iyengar Yoga that distinguishes it from the other schools is the use of props. These props are supports that are used to perform yogāsanas with less effort without compromising on the quality of the āsana. The props that are commonly used are blankets, belts, pillows, ropes, chairs, bandage cloth and other wooden supports of various shapes and sizes. In addition, these props also make it possible for the practitioner to stay in the āsana for longer duration of time than what would be possible without support; thereby enhancing the effect of the āsana on the mind and the various physiological systems of the body.

These props are very useful for patients suffering from ailments or maladies. First and foremost, a diseased individual is always a little apprehensive. Even if they are told that a particular āsana is good for their condition, they would still be scared to do it. These props give them courage and confidence to do them as their body is totally supported.

Secondly, they give direction to the practitioner to do the āsana correctly. An āsana not done correctly will not lead to the desired effect. The situation is akin to a drug which may be rightly prescribed by a physician and consumed regularly by a very compliant patient but the treatment will not be effective if the quality of the drug is compromised. Similarly, if the quality of the āsana is compromised then it is not effective. The props facilitate even a novice in the field to acquire the right position in the various āsanas.

Thirdly, it is essential for the practitioner to stay in specific āsanas for a specific period of time for the āsana to be effective on the organic body or the different physiological systems. The support aids in letting the practitioner stay in different yogic postures for longer time than would be possible without support. Therefore, props become an essential component in the management of HT in Iyengar Yoga.

**Stress and lack of appropriate coping mechanism causes of HT:** In majority of cases of HT, the primary cause remains unknown and these patients are categorized as suffering from essential or idiopathic HT. In most such cases, HT is a result of stress or rather inability to cope with stress.
The body has a well-defined physiological response to stress wherein the sympathetic nervous system gets stimulated. Increase in stress results in increased heart rate, increase in blood pressure, increased flow to the vital organs as all these are means that aid the body in ‘fighting’ the stress. When the body no longer perceives stress, the parasympathetic nervous system gets stimulated and relaxation sets in. However, when an individual’s body continuously perceives stress then the increase in blood pressure is no longer transient but becomes sustained and the individual develops HT. HT in such individuals can be controlled by externally initiating the relaxation process. One of the most effective ways of inducing relaxation is the practice of āsanas.

Āsanas that aid relaxation: It is common observation that when individuals are very stressed, they have a tendency to bend their head forward and rest the forehead on the palm or press the index finger and the thumb on the forehead. Basically, the forehead ‘wants to rest’ to combat the stress. This is the body’s natural response. Āsanas which mimic this response are therefore beneficial to combat stress.

Forward bending āsanas: Forward bending āsanas like jānu śirsāsana, ardha badha padma pashchimottānāsana, trianga mukha eka pāda pashchimottanāsana and pashchimottanāsana calm the mind and bring about relaxation. For details on these āsanas, the reader is referred to Light on Yoga by BKS Iyengar (2001). However, just doing these āsana would not ‘reduce’ the blood pressure. What is important is how these are done. For all these forward bending āsanas to be effective it is important that:

- the forehead is rested or supported.
- the sides of the trunk elongated and
- the throat and neck are kept passive

In the enthusiasm to rest the head on the knees or shin, individuals often tighten and shorten the neck – this in fact would increase the blood pressure. On the other hand, if the forehead is not rested, then it fails to bring the desired effect. Furthermore, if the sides of the trunk are not extended, the back becomes convex and the chest sinks making breathing uneasy which in turn raises the pressure.
It is here that one should take the support of a bolster or a couple of folded blankets. This bolster/folded blankets are placed on the shins and then one can easily rest the forehead on these blankets. Now, the head is not only rested but at the same time neck is kept soft and the trunk extended. Practicing these āsanas for 3-5 minutes each on a regular basis does help in combating the physiological stress response and subsequently reducing the blood pressure.

**Supine āsanas:** The supine āsanas like supta virāsana, supta baddha konāsana and śavāsana facilitate relaxation. As the chest is ‘well opened’, breathing becomes easier and the practitioner feels relaxed. The use of a long pillow or a bolster underneath the spine extends it and facilitates relaxation. It is only with the use of these props that one can have extension as well as relaxation at the same.

**Significance of inverted āsanas in managing HT:** The role of baroreceptors in maintaining blood pressure is well known to physiologists. These baroreceptors are pressure sensors located in the walls of major arteries. Being stretch receptors, they are active when the artery is stretched. They respond by controlling the heart rate and arterial diameter. These receptors are present in abundance in the carotid artery (Robin, 2009).

If the arterial pressure is low then the baroreceptors will excite the sympathetic nervous system and raise the blood pressure. If the arterial pressure is high then the baroreceptors trigger the parasympathetic nervous system. Thus, when the body is inverted then the pressure at the baroreceptors is raised leading to the activation of the parasympathetic system. One may have often noticed how people tend to massage their necks instinctively when they are very tensed or stressed. This is a natural instinct of the body to pressurize the baroreceptors on the carotids which in turn stimulates a relaxation response.

When the body is tilted into an inverted position, pressure at the baroreceptors is raised. However, the baroreceptors get activated only when the body is tilted 50 to 60 degrees from the vertical position (Cole, 1988). This clearly suggests the importance of inverted āsanas in controlling HT. Śirsāsana, sarvāṅgāsana, halāsana have to be practiced regularly by the hypertensive individuals.
Despite clear indications of the benefits of inverted āsanas in managing high blood pressure, it cannot be immediately taught to novices in yoga. The mere thought of ‘doing’ any of these postures in most instances would cause palpitation and instead of reducing, raise the blood pressure. Therefore, the inverted āsanas have to be introduced to them gradually.

To start with, they are taught uttanāsana and adho mukha svanāsana. In both these āsanas, the head is supported. They can also be made to do ardha uttanāsana with the forehead rested on the seat of a chair. Later, they can be introduced to prasaritta padottanāsana. In all these cases, care should be taken that the neck is relaxed and soft.

After the practitioners have become accustomed to the upside down position of the head, they can be introduced to sarvāngāsana on the chair and ardha halāsana. Finally, they can be introduced to śirsāsana. Patients with high blood pressure are not advised to do independent śirsāsana. This is not because śirsāsana itself is harmful but if they are unable to lift their shoulders well, then they would tense the neck which in turn would trigger a stress response and raise the blood pressure. They are made to do śirsāsana with the support of a hanging rope. Although, śirsāsana is taught after they have become confident to do sarvāngāsana, once they learn to do both, then śirsāsana is always performed before sarvāngāsana and ardha halāsana. Even setu bandha sarvāngāsana is very useful for such patients.

Age related increase in blood pressure and its control: As we age, the arteries narrow, and this in turn is one of the potential causes of HT. The arteries are thick walled and muscular elastic structures which offer resistance to blood flow. The cumulative resistance of arteries and arterioles is called peripheral resistance. With aging, these arteries lose their elasticity and harden causing arteriosclerosis. This hardening of arteries increases the peripheral resistance and markedly raises the blood pressure. Maintaining elasticity of the arteries would prevent the age related rise in blood pressure.

Āsanas stretch the body in totality including muscles, ligaments, capsules and bones. Not only the skeletal muscles, but the also the muscles in the various organs and the blood vessels can get stretched in certain āsana. Thus regular stretching of all body segments keeps all arteries elastic and prevents arteriosclerosis and lowers blood pressure by lessening peripheral resistance. The backward bending āsana like viparita dandāsana, urdhva dhanurāsana and more intense āsanas like kapotāsana and eka pāda rajkapotāsana, chakra
Bandhasana bring about a physiological stretch on the arterial walls and play a crucial role in keeping the cardiovascular system healthy.

Scientific evidence on the efficacy of Iyengar Yoga in lowering blood pressure: Cohen et al (2009) reported on the results of a randomized control trial on ‘Iyengar Yoga versus enhanced usual care on blood pressure in patients with pre-HT and stage I HT’. 78 patients with essential HT were either asked to follow the conventional dietary and exercise regime or practice Iyengar Yoga and the pressure for a 24 hour period was recorded at baseline, 6 and 12 weeks. The results of this study demonstrated that Iyengar Yoga produces clinically meaningful reductions in systolic as well as diastolic blood pressure at 12 weeks compared to baseline although this drop is not observed by 6 weeks. Dietary restrictions did lead to an initial drop in the blood pressure but this decrease was not maintained. Any change in systolic blood pressure is a meaningful observation as earlier studies have shown that even a 2 mmHg drop in the systolic pressure reduces the risk of Ischemic heart disease by 7% and that of stroke by 10%.

Conclusion: Essential HT can be managed by the regular practice of yogāsanas. To get the desired effect, how the āsanas are performed is as important as which āsanas is ‘prescribed’ to the patients. The use of props gives confidence to the patient to perform the āsanas and helps in simultaneously extending and relaxing the body.

References:

3. Iyengar BKS (2001) Light on Yoga Publisher: Harper Collins India
Note: The nomenclature of the āsanas varies between the different schools of yoga. The reader is requested to refer to the Light on Yoga by BKS Iyengar for the āsanas mentioned in this manuscript.

Acknowledgement: The author wishes to express her gratitude to her Guru Yogacharya BKS Iyengar, Smt Geeta and Shri Prashant Iyengar for their teachings and sharing their wisdom. She also acknowledges Shri Bidyadhar Kar for assisting her in the lecture demonstration at ACYTER – JIPMER workshop on Yoga and HT.
PSYCHOLOGICAL ASSESSMENT OF HYPERTENSION:

A YOGIC PERSPECTIVE

Dr Latha Satish PhD

“Dharmarthakamamokshanam arogyam mulamuttamam”

(Health is the best pathway towards dharma, artha, kama and moksha)

Health is usually conceptualized as a state or disposition of a person’s freedom either from illness or capacity to resist illness in a discrete manner. This view confines it to human body. However, Indian perspective of health constitutes a dynamic relationship of body, mind and spirit. This is clearly outlined in all the traditional healing systems, like Ayurveda and yoga that originated in India.

A thorough evaluation of indigenous traditions of health care like yoga requires understanding and documenting the holistic conception of health and wellbeing achieved through such practices.

Our perspective on health wellbeing and disease management shall be enriched when we incorporate physical, mental, social and spiritual parts of an individual both in assessments and interventions. Thus the designs of our studies must have multiple integrative perspectives.

Currently, great deals of yoga research studies focus on mind-body interventions, where the outcomes are predominately evaluated are physical or physiological. Psychological or social changes are minimally documented. This is happening in spite of the awareness that yoga is basically a tool to regulate the mind (Yoga sutra 1:2)

According to science of yoga all the afflictions whether it is at body and or at mind level is an impediment. In the modern context the three risk factors that are high blood pressure, cholesterol and diabetes are considered to be toxic triad which influences the quality of life, productivity, longevity and adds to the disease burden of the society.
**Hypertension and yoga research:**

Hypertension or high blood pressure is a condition which is affecting millions of people and is a major contributor to many other conditions like stroke, artery disease and major organ failure. The Yogic intervention for hypertension as the first line of treatment was undertaken as early as 1960-70s by Datey (1969) and Patel and North (1975). Latha and Kaliappan (1991) have conclusively established that practice of yoga especially savasana can reduce blood pressure among regular practitioners. These studies have focused on yoga as a relaxation exercise for managing hypertension.

**Psychological factors:**

In the biomedical model of risk analysis the etiological factors associated with onset and maintenance of hypertension are age, gender, obesity, sedentary life style, smoking and diabetes. The health and illness models proposed by psychologists enumerate certain specific personality types as risk factors.

The stress and illness models emphasizes on hostility, anger, type A behaviour pattern, depression, pessimistic attitudes as “toxins” which aggravate the condition. Even the Biomedical factors are found to be primarily associated with the psychological states and personality styles.

Apart from the risk analysis it is also observed that there are some protective factors which operate in ameliorating the disease and also prove delay the onset of disturbances. In the health and stress coping model, the access to social support, resilience, positive moods and optimism are considered as “buffer” and as protective factors. The link between stress and health is well established and the role of moderating or mediating factors is the internal/eternal psychological resources which have to be built up and nurtured.

The model given below presents the psychological mechanism which is involved in stress experiences. The link between stress and disease or health is well established. But the experience of stress itself is moderated and mediated by many factors (Lazarus)
Stress perception model:

According to this view how an event or situation is perceived is an indicator of the process of stress experience. The individuals who perceive some events as harmful and threatening are more likely to experience higher level of strain and also may be more reactive. On the other hand perceiving the life situations as challenge is considered as more positive approach. The individual differences are there in the way potential stressors are perceived.

Simultaneously the capacity to know ones own coping resources and an ability to utilize them to deal with situation is also another level of appraisal termed as secondary appraisal.

The aforementioned process leads to the actual stress experience the signs of which are noticed at body, breath, mind and functional level. These are measured as physiological changes (heart rate, GSR) emotional responses (anxiety, anger, sadness) behavioral responses (procrastination, withdrawal) and cognitive parameters (concentration, psychomotor retardation) Each of these are likely to influence many aspects of life in terms of functional effectiveness, satisfaction, productivity, performance, happiness and health status.
Coping as an important strategy:

The ability to cope or put efforts to deal with the stress forms an important modality of maintaining health. Yoga as a mind body interactive approach is one of the effective coping models which can enhance well being. In general the research in yoga has mainly focused on the physiological bio-medical endpoints and minimally on the psychological processes of endpoints.

The model given below presents the areas of influence of yoga practices which an affect the outcome of yoga and hypertension research

Yoga as a coping model: The practice and philosophical tenets of yoga aims to bring out a transformation in the mental processes. These can be identified in terms of emotional and cognitive changes. The changes in perceptions and non judgmental attitudes associated with the practices are indicated by practitioners as well as researchers. Ability to take both success failures equanimously and events of life in a balanced way is the characteristics of yoga state.

At the cognitive or thought level, the practice of yoga (including asanas, pranayama and meditation) are supposed to influence the way we view the events of life i.e. perception of events (primary appraisal) and similarity they are supposed lead to clarity and realistic orientation to our energy, stamina and capacity (secondary appraisal).

The achievement of such a state of objectivity in terms of cognitive evaluations can reduce the impact of life events on the body and mind. Acceptance of life or taking it as a challenge is a cognitive attitude which is the process which has to be quantified in yoga research
Yoga as a practical tool involves many body mind oriented practices which instills a confidence in the individual that empowers them with a view that I have resources that are at my disposal are adequate. I can take control and deal with situations. These feelings and thoughts are to be evaluated in terms of practices which mark the coping strategies.

At the behavioral level the practices of yoga helps one to access the internal coping resources. The person learns to relax, regulates emotions, seeks help, learns to seek information, reasons, performs right actions and controls impulses. These coping behaviors are considered present-oriented and action-oriented coping. Sometimes it may also be an acceptance and passive relaxed attitude. These behaviors are considered as adaptive coping, when these are a regulation of emotion, adaptation and acceptance. When the behaviors are characterized by higher emotional arousal it can be anger, time urgency, anxiety, pessimism and hostility, which is considered maladaptive coping.

Yoga practices aims to enhance action oriented and present oriented coping strategies which enhances well being. Changes in mood states, emotional regulation, present orientation, relaxed alertness, ability to be in flow, internal locus of control, acceptance, hope and optimism are some of the psychological outcomes extensively researched to demonstrate the influence of yoga on mind. Yoga builds the internal resource at body and mind level when applied in day to day life. Quality of life from yoga point of view is internally based rather than externally based.

The end point of such a transformation or changes is the better quality of life. This can be reflected in wellbeing at the physical functional level, psychological level, cognitive level, and also at interpersonal relations or social health. The need is to look for these changes at the emotional, cognitive and behavioral level and the psychological instruments have to be used appropriately using the model of intervention.

The basic rationale of choosing psychological instruments must be based on the aforementioned theoretical model. The researcher decides whether they are analyzing the stressors, evaluating stress or the coping strategies.

Psychological tools include:

1. A measure of how the perceptions or events are interpreted?

2. Measure of coping preferences or styles
3. Assessment of stress reactions at physical, behavioral and cognitive level.
4. Assessment of emotional reactivity or stability.
5. Indicator the personality or attitude which is likely to be involved in aggravating or inhibiting the stress.

Following are some of the psychological instruments that can be used in yoga research where its impact is studied.

1. Measures of anxiety, anger, hostility, depression, social isolation,
2. Personality measures like type A behaviour pattern, life orientation, emotional intelligence, self esteem, locus of control etc
3. Cognitive measures like hardiness, optimism, pessimism, interpersonal relation orientation.
4. Other lifestyle related behaviors such as daily activities, moods, indices of well being

**Yogic perspective:** The trguna theory is one of the basic models which has generated many tools for assessment of the effect of yoga practices. But its psychometric properties are not well established. The classical texts on yoga provide rich literature on the characteristic psychological states of a yoga practitioner. But quantification is yet to be taken up and it is the most challenging because of the subjectivity in the measurements and also the process of obtaining a reliable and valid indicator is a challenging task. Other than these, there is a need to develop a valid measurement tool based on yoga principles of lifestyle which can be a marker of therapeutic mechanism.
THE ROLE OF YOGA IN MANAGEMENT OF HYPERTENSION: A PERSONAL EXPERIENCE

Yoga Bhishmacharya Sri Bala Ratnam

Introduction: Respected Chairman of this National Seminar and Workshop, Madanmohanji and stalwarts in the science of yoga assembled today. Please accept my sincere greetings from down under! You all are performing a noble task to explore the role of yoga in the prevention and management of hypertension. I wish you the success it richly deserves, because it does hold the answers. This talk should be of interest to you as it illustrates that there are practices in the science of yoga to assist one to prevent and manage not only hypertension but other common diseases as well. They require adopting the selected practices into a sadhana and adapting the discipline of the daily practice of the sadhana as a way of life.

Background: This is a submission by me, who, through circumstances completely beyond my control, was led to the science of yoga to combat trauma, stress and resultant hypertension. The hypertension fluctuated so badly it was called unstable high blood pressure. I wish to share my experience with you. It all started around 1965 when I was about 43 years of age and was caving in under a severe personal trauma. I was mysteriously introduced by my deceased grandmother, through a spiritual medium to mantra yoga. The chanting of the Shiva mantra helped me to rise above my immediate problem and move on with my life.

The power of mantra: During this period of time I also studied under the late Swami Satchidananda, Head of Integral Yoga for a short while. I was also introduced to the power of mantra by the late Yogi Ramiah, Head of Kriya Babaji Sangham, who brought down rain after a twenty four hour chant of their mantra to parched Colombo. This mind-boggling incident inspired me to chant the Shiva mantra 108 x 108 times daily for the next ten years. In the eighth year of my chant I was able to put it to test and restore the health of an infant grandson of mine, who was felled by a mysterious illness.

Founder Vibrational Breath Therapy, Melbourne, Australia. www.vbt.com.au
**Pranayama:** In 1980 I attended by first Yoga Shibir of 21 days duration at Kannya Kumari, India, conducted by Dr Nagendra, present Head of SVYASA. I learnt from him a few basic breathing techniques, which I started practising seriously with the chanting.

**The power of the combination of breathing and chanting:** Three years later I fell mysteriously ill with hepatitis, pleurisy and a virus infection of the muscular system. I was bad for three days but soon recovered sufficiently to leave the nursing home in ten days. A CT scan at the end of a month revealed I was in good shape. It made me ponder whether the combination of both the breathing and chanting practices had contributed to my speedy recovery.

**Studies in yoga:** This led to my qualifying as a Yoga Therapist and Instructor at SVYASA (then known as Vivekananda Yoga Research Foundation) Bangalore India in early 1984. Dr Nagarathna was my distinguished guru. During the year I also attended my first International Yoga Conference at Kaivalyadhama, and attended a class on pranayama with the late Swami Digambarji. I followed up with qualifying from the Bihar School of Yoga the following year and migrated to Australia to practice as a Therapist in Melbourne since 1986.

**Yoga therapy is no different from yoga:** Two years into my practice as a yoga therapist, a fundamental truth dawned on me. It was that yoga therapy was no different from yoga. What was expected of a yoga therapist was only to help a student/patient to develop physically, mentally, emotionally and spiritually, complementing whatever medical treatment needed. The healing took place on its own, within the constraints of one’s karma.

**Practice and program:** My concern whether there was a practice to achieve it, was soon laid to rest by a yogini instructing me from within to get a lady who was bed-ridden for three years with lumbar spondylitis in Bangalore to walk again. This was achieved by chanting of OM and allowing it to vibrate and resonate at her lower back. She was to start with 27 chants of OM on the first day, add one more chant every day for 81 days, till she reached 108 chants. She started walking again long before 81 days. Dr Nagaratha will bear testimony to this as she saw this lady before and after this healing intervention. The lady walked over a half a mile and climbed on her own the flight of steps to meet the doctor.
Mahat yoga pranayama and pranava AUM: From there I proceeded to learn under the late Yogamaharishī Dr Swami Gitananda Giri Bhavanani Maharaj an authority on pranayama at the International Centre for Yoga Education & Research, Pondicherry. Dr Ananda Balayogi Bhavanani is its present Chairman.

Swamiji introduced me to, among several other Rishiculture Ashtanga yoga practices, energy-giving mahat yoga pranayama and soul-realising pranava AUM. It resulted in my learning about the cosmic vibratory healing energy of pranava AUM, which creates and sustains all animate and inanimate objects in this Universe, and its varied applications. Whereas the practices I learnt from the other distinguished gurus were good, they were not all embracing, sufficiently energising or soul satisfying to me, like those I learnt from my revered Swamiji.

The five koshas we live in, Swamiji said, are manifestation of cosmic energy or prana. They are energy bodies, which need daily sustenance of prana to energise the cells and the vibratory resonant frequency of Pranava AUM to make the cells experience a state of wellbeing. Prana is absorbed by the body-mind complex only by breathing over 70% of the lung capacity in mahat yoga pranayama, the complete yogic breath. When this occurs 99.56% of prana is absorbed, with the balance obtained naturally from eating food etc. It may be remembered in this context that we normally breathe not more than 20% of our lung capacity and according to Swamiji we can therefore only be 20% healthy, functionally efficient and mentally active.

There is a relationship between the lung, skin and brain cells. Also, only 60% of the metabolic and toxic wastes from the body is expelled from the lungs reinforcing the need to not only breathe-in deep but also breathe-out deep. And when mahat yoga pranayama is done in different ratios in an 81 day program, it regenerates and rejuvenates the body by producing healthy glandular and blood cells and bodily fluids. 81 days or approximately three months are required for both body and mind to accept and benefit from this advanced yogic practice.

The vibratory resonance produced in the chanting of pranava AUM resonates to the vibratory frequencies of the physical body, mind and self-consciousness and integrates them. It also transcends the wakeful, dream and deep sleep states of consciousness associated with AUM,
and leads one to the fourth state beyond conceptualisation, Turiya, the state of causal silence within. This creates the optimum condition within for the cell to renew, repair and self-heal.

**81 day vibrational breath therapy (VBT) program:** The 81 day VBT program develops one physically, mentally, emotionally and spiritually, complementing the medical treatment. It helps a student/patient to rise above the body and conscious mind, negate ego consciousness and attune to a higher state of consciousness, which I like to call the state of causal silence within, wherein renewal, repair and healing take place. The healing takes place on its own, within the constraints of one’s karma. I’ve developed the program with a main practice and two complementary practices to create a state of wellbeing throughout the 24 hours of the day. Pranava AUM regenerates, rejuvenates and rehabilitates by creating a state of wellbeing. It is generally done in the morning to set the tone for the day.

**Savitri pranayama:** I introduced complementary harmonising and tranquillising savitri pranayama (rhythmic breath and its meditational walk) to be done once in mid-morning, noon and mid-afternoon or when stressed, tense, depressed or tired. Each rhythm is done only nine times followed by sitting still for three minutes to experience its specific benefit. It creates a state of wellbeing during the day and takes only a few minutes.

**Yoga nidra:** I also introduced complementary yoga nidra (psychic sleep) which deeply relaxes the body, stills the mind, neutralises the traumas and tensions of the day and gives a restful and refreshing night’s sleep. This is done at time of doing an afternoon siesta or going to sleep at night.

**Results:** It commenced with me eradicating a ten year old virulent hay fever in 1989. After three years of practice I was satisfied with its miraculous cure of patients with cancer, a 30 year old psychotic condition, a 10 year old severe asthma and a 20 year old depression etc. So I decided to delve deep into it and discover its hidden truths. After twenty one years of personal practice and nineteen years of teaching this 81 day Vibrational Breath Therapy program to hundreds, I’m convinced of its validity and efficacy.

**Additional features:** As a result of my personal sadhana of four hours daily, I have been able to go deep within and develop “Chakra Healing”, which is based on Pranava AUM, a more advanced vibrational breath therapy main practice. It has the added features to neutralise
emotional traumas and tensions of this and previous births, which are at the root of all internally caused conditions, which includes hypertension. It also enhances the psychic qualities of the major chakras to transform the personality and character to lead a life of fortitude and equanimity and activate the process of healing.

**Recommendation:** I strongly recommend to you the 81 day “Chakra Healing” program for the prevention and management of hypertension and other common diseases. It is of two descriptions: An 81 day program recorded on a DVD/CD, which is more than sufficient for normal cases and an 81 day person to person program to be learnt either in person from accredited teachers or me or as a correspondence course in the case of advanced cases, after trying out the DVD/CD (as above) on their own. The program has instruction to breathe in mahat yoga pranayama as its added feature.

Some of you experienced my workshop on “Chakra Healing” at the ACYTER or Ananda Ashram or the International Yoga Festival in the first week of January 2010. You may have experienced its ability to lead you into the state of causal silence within – the peace within, wherein renewal, repair and healing take place. The practice of this 81 day Vibrational Breath Therapy program has enabled me to lead a very active life daily from 6 am to 10 pm, despite going 88. I rest during the day, if and when needed. I do not give second thought to my hypertension.

**Give priority to sadhana:** The advice by my physician consultant, an advanced soul, Dr Kuan Chin, is to give priority to my Sadhana. That is what I’ve been doing, for the last ten years. I do take medication, but I’ve progressively come to the stage, when I can afford to give priority to my sadhana, without any regrets. I’ve developed a discipline whereby medication complements my sadhana and not vice versa. I strongly commend to you to go through my website www.vbt.com.au and read more about VBT. It may hold the answer for hypertension.
MONITORING AND MANAGEMENT OF COMPLICATIONS OF HYPERTENSION – A PHYSICIAN’S PERSPECTIVE

Dr Aparna Agrawal, MD

**Definition of HTN:** Level of BP at which institution of therapy reduces BP related morbidity and mortality i.e. $\geq 115 / 75$ mm Hg.

**Measurement of BP**
- Use a properly calibrated and validated machine
- Measure sitting BP routinely
- Remove tight clothing from the arm
- Use an appropriate size cuff
  - Width $\geq 40\%$ of arm circumference
  - Length $\geq 80\%$ of arm circumference
- Support the arm at the level of the heart.
- Lower the mercury slowly (2mm/sec.).
- Read the BP to the nearest 2 mm Hg.
- Use phase V sounds to measure DBP.
- Take 2 measurements at each visit.

**White coat hypertension**
- A surge in BP in the clinic, especially when recorded by a doctor.
- Found in 20% of patients approximately
- Increased risk of developing sustained HT & CVD

**Continuous (≥ 24 Hrs) ambulatory BP recording:**
- Provides better BP profile.

*Professor, Department of Medicine, JIPMER, Pondicherry-6*
• Measures the extent of BP reduction during sleep.
• Correlates more closely with target organ damage (TOD).
• Average ambulatory day time BP should guide management decisions.
• Diurnal variations in BP can be recorded.
• Night time BP is generally 10-20% lower than day time BP known as “dip”
• “Non-dippers” have an increased CVD risk
• Early morning BP higher than at other times of day is associated with an increased risk of MI or stroke.

When to advise ambulatory BP recordings?

In patients with
- Unusually labile BP
- Refractory HTN
- White coat HTN
- Autonomic dysfunction
- Symptomatic hypotension

Home BP recording:

• Usually lower than clinic BP recording.
• Provides information on response to anti-hypertensive therapy.
• Improves patient’s adherence with therapy.
• Useful for evaluating white coat hypertension.
• It more reliably predicts TOD.

*Home measurement devices should be checked regularly for accuracy.

Relationship between clinic, awake and asleep home BP recordings:

<table>
<thead>
<tr>
<th>Clinic BP</th>
<th>Awake BP</th>
<th>Asleep BP</th>
</tr>
</thead>
<tbody>
<tr>
<td>140/90 mm Hg</td>
<td>135/85 mm Hg</td>
<td>120/75 mm Hg</td>
</tr>
</tbody>
</table>

Pulse pressure: PP = SBP – DBP

Normal 30 – 60 mm Hg

Higher PP with similar BP is associated with:
- Increased CVD risk
- Increased all cause mortality
- Especially in elderly patients

Central aortic pressure (CAP)

• Both indicator of arterial hemodynamics.
• More predictive of CVD outcomes.
• Antihypertensive therapy with apparently similar effects on brachial BP may have different effects on CAP.

Measurement of CAP
• Standard cuff BP measurement and proprietary software- SphygmoCor
• Average difference between brachial BP and CAP is (CAP > Brachial BP)
  \[ M:F = 11:8 \text{ mm Hg} \]
• Normal brachial BP usually corresponds to high normal to stage 1 HTN on CAP.

Steps after diagnosis of HT
• Check for identifiable causes of HTN
• Check for co-morbidities
• Check for TOD: baseline investigations; special investigations

When to suspect secondary HTN?
In
• Younger patients
• Refractory HTN
• Labile HTN
• Suggestive history and physical examination
• Absence of positive family history

Causes of Secondary HTN

- Alcohol
- Obesity
- Obstructive Sleep Apnea
- Pregnancy
- Drugs
- Acromegaly
- Hyper/Hypothyroid
- Hyperparathyroid
- Coarctation of Aorta
- Cushing’s/Conn’s
- Phaeochromocytoma
- G.N./CKD/Cystic dis. of Kidneys
- Neurogenic
Target organ damage (TOD) in HTN

Baseline investigations
- Haemogram
- Urine: albumin/glucose/microscopy
- Blood urea, serum creatinine, serum electrolytes
- Fasting blood glucose, lipid profile
- ECG
- Fundus examination
- Echo heart
- Other special tests as indicated.

Management: we need to answer the following questions:
- Why treat HTN?
- Whom to treat?
- Should we treat pre HTN?
- What are the principles of management of HTN?

Why treat HTN?
- The risk of CVD beginning at 115/75 mm Hg doubles with each increment of 20/10 mm Hg.
- Impact of reduction in BP of 10-12/5 mm Hg is a relative risk reduction of
  - 35 - 40% in stroke
  - 20 -25% in CHD
  - >50% in heart failure
○ 10 – 15% in all cause mortality.

**Whom to treat?**

<table>
<thead>
<tr>
<th>BP Classification</th>
<th>SBP* mm Hg</th>
<th>DBP* mm Hg</th>
<th>Lifestyle modifications</th>
<th>Drug therapy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Normal</td>
<td>&lt;120</td>
<td>&lt;80</td>
<td>Encourage</td>
<td>No</td>
</tr>
<tr>
<td>Pre HTN</td>
<td>120 - 139</td>
<td>or 80–89</td>
<td>Yes</td>
<td>No*</td>
</tr>
<tr>
<td>Stage 1 HTN</td>
<td>140 – 159</td>
<td>or 90–99</td>
<td>Yes</td>
<td>Single agent</td>
</tr>
<tr>
<td>Stage 2 HTN</td>
<td>≥ 160</td>
<td>or ≥100</td>
<td>Yes</td>
<td>Combination</td>
</tr>
</tbody>
</table>

*In patients without compelling indications. Patients with co-morbidities may require drug therapy.

**Should we treat pre-HTN?**

- Yes with LSM + drugs because pre-hypertensives have:
  - 58% higher risk of CV death
  - 76% higher risk of heart attack
  - 66% higher risk for any cerebrovascular event

Pre-hypertensive “non dippers” are at higher risk for development of overt hypertension and cardiovascular morbidity.

**What are the principles of management of HTN?**

**COMPREHENSIVE + INDIVIDUALISED CARE** is the new MANTRA.

**Comprehensive:**

- Correct modifiable risk factors
- Achieve target BP control
- Prevent/ manage TOD

**Individualised:**

- Considerable variations in individual responses to different classes of anti-hypertensive agents.
- Magnitude of response to any single agent may be limited.

**Correct modifiable risk factors** by **life style modifications (LSM)** – Why?

- In Borderline HTN, may obviate need for drug therapy.
- In established HTN, may decrease the dose and /or number of drugs required.
- May decrease CVD risk directly.

<table>
<thead>
<tr>
<th>Lifestyle Modifications to manage HTN</th>
<th>Approximate SBP reduction (mmHg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weight reduction</td>
<td>5–20 /10 kg weight loss</td>
</tr>
<tr>
<td>Adopt DASH* eating plan</td>
<td>8–14</td>
</tr>
<tr>
<td>Dietary sodium reduction</td>
<td>2–8</td>
</tr>
<tr>
<td>Physical activity around 30 minutes per day</td>
<td>4–9</td>
</tr>
<tr>
<td>Reduce or stop alcohol consumption</td>
<td>2–4</td>
</tr>
<tr>
<td>Tobacco abstinence</td>
<td></td>
</tr>
<tr>
<td>Relieve stress</td>
<td></td>
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</tbody>
</table>

*Dietary approach to stop hypertension

Functional foods:
Definition: Foods and food components that provide health benefits beyond basic nutrition.
✔ Foods proven to reduce BP are garlic, milk, flax seeds.
✔ There are many foods which reduce CV risk by decreasing LDLC, total cholesterol or risk of heart disease directly. They include almonds, broccoli, dark chocolates, grapes, oat meal, tomatoes and yogurt.

Drug therapy - needs to be individualized based on:
- Age of patient
- Severity of HTN
- Presence of other CVD risk factors
- Presence of co-morbid conditions
- Practical considerations such as cost, side effects, frequency of dosing
- BP targets
- Broad drug classes

BP Targets

<table>
<thead>
<tr>
<th></th>
<th>Without comorbidities (mm Hg)</th>
<th>With comorbidities (mm Hg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clinic measurement</td>
<td>&lt; 140/85</td>
<td>&lt; 130/80</td>
</tr>
<tr>
<td>Ambulatory/ home BP</td>
<td>&lt; 130/80</td>
<td>&lt; 120/75</td>
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</tbody>
</table>

Note: Both systolic and diastolic BP targets should be achieved.
**ALGORITHM FOR TREATMENT OF HYPERTENSION**

**Resistant HTN:** BP persistently $> 140/90$ mm Hg despite taking 3 or more antihypertensive agents including a diuretic in a reasonable combination and at full doses.

**Causes or resistant HTN:**
- Non-compliance with drugs
- White coat hypertension
- Secondary HTN
- Alcoholism
- Obesity
- Use of drugs causing rise in BP.

**Follow up and monitoring**
- Stage 1: monthly intervals
- Stage 2 / complicating co-morbid conditions: more frequent
- Stable target BP: 3-6 monthly intervals: more frequent with co-morbidities
Check up for TOD
- Baseline
- Annually, if negative
- More frequent, if positive

Compelling Indications for Individual Drug Classes

<table>
<thead>
<tr>
<th>Compelling Indication</th>
<th>Recommended Drugs</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Diuretic</td>
</tr>
<tr>
<td>Heart failure</td>
<td>✓</td>
</tr>
<tr>
<td>Post myocardial infarction</td>
<td>✓</td>
</tr>
<tr>
<td>High coronary disease risk</td>
<td>✓</td>
</tr>
<tr>
<td>Diabetes</td>
<td>✓</td>
</tr>
<tr>
<td>Chronic kidney disease</td>
<td></td>
</tr>
<tr>
<td>Recurrent stroke prevention</td>
<td>✓</td>
</tr>
</tbody>
</table>

ACEI = Angiotensin converting enzyme inhibitors. ARB = Angiotensin receptor blockers. BB = β–blockers. CCB = Calcium channel blockers. ALDO ANT = Aldosterone Antagonist

Side effects and contraindications of commonly used drug classes

<table>
<thead>
<tr>
<th>Drug class</th>
<th>Cautions and Contraindications</th>
<th>Side effects</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACEI and ARBS</td>
<td>Renal failure</td>
<td>Cough (ACEI)</td>
</tr>
<tr>
<td></td>
<td>Bilateral renal artery stenosis</td>
<td>Hyperkalemia</td>
</tr>
<tr>
<td></td>
<td>Pregnancy</td>
<td></td>
</tr>
<tr>
<td>β – blockers</td>
<td>Asthma</td>
<td>Bradycardia</td>
</tr>
<tr>
<td></td>
<td>COPD</td>
<td>Exercise intolerance</td>
</tr>
<tr>
<td></td>
<td>Heart blocks</td>
<td></td>
</tr>
<tr>
<td>Calcium channel blockers</td>
<td>Heart failure</td>
<td>Pedal edema</td>
</tr>
<tr>
<td></td>
<td>Heart block</td>
<td>Headache</td>
</tr>
<tr>
<td>Thiazide diuretics</td>
<td>Diabetes</td>
<td>Electrolyte dist.</td>
</tr>
<tr>
<td></td>
<td>Dyslipidemia</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Gout</td>
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</table>
**DHYANA: METAPHYSICAL AND THERAPEUTIC PERSPECTIVES**

Prin. R. S. Bhogal

**Introduction:** “To know oneself and one’s environment as comprehensively as possible” is probably the most basic need of human being. Even the pre-historic man was known to contemplate on the sublimity of the nature. The dictionary meaning of meditation is *cogitation, contemplation, thinking, brooding over, and reflecting over* and so on. It indicates one’s longing towards ”knowing” as “knowing” alone gives us a rare sense of freedom within. The more objective is the “knowing”, the more will be our cognitive or perceived freedom.

The more we are near the objective understanding of the Reality the more we become free and relaxed as the ensuing detached attitude makes us more unbiased, unprejudiced and equanimous. We are then able to conserve our psycho-physiological energy by preventing its unnecessary dissipation and at the same time gain all possible angles of everything we perceive. The resulting enhanced reality perception keeps us on guard against falling victim to emotional upheavals and emotional over-reactions, as well as, keeps us poised in decision making and problem solving, in a far better way.

*Yoga meditation* (i.e. *dhyana*) is much more than the term meditation, in that the former is non-intentional and transcendental, unlike the latter. *dhyana*, the seventh limb in Pantanjali’s *Ashtanga Yoga*, has been defined as,“*A continuous and unbroken flow of consciousness* (PYS: III: 2). *Dhyana* is preceded by *dharana* which is defined (PYS. III: 1) as “*Attention localized within or without the body.*” However, Karambelkar (1987), Shastri (1960) and some other authorities in yoga hold that in *dharana* the attention should necessarily be glued to some space within the body itself, and not outside the body. According to the *Yoga Sutra*, *dharana* is preceded by four types of *samapattis* viz. *vitarka, nirvitarka, savicara* and *nirvicara*. Our consciousness is increasingly, getting ‘purified’ as we transcend these *samapattis* one by one. In *dhyana*, though consciousness is quite purified, there remains distinction amongst *dhyeta* (mediators), *dhyana* (meditation) and *dhyeya* (object of meditation). In *samadhi*, however (P.Y.S.III: 3), only the meaning of
the object shines forth. By virtue of getting influenced fully by the object of meditation, the consciousness appears to be akin to a void-like state.

In the state of dhyana our consciousness becomes all encompassing and thereby our basic need of knowledge is fulfilled. This state, signifying non-judgmental and non-reactive awareness, remains transcendental. The pranic flow, throughout the body, becomes unhindered. According to Bhagwat Gita, in such a yoga state, all miseries vanish and the yogic joy (prasada) effuses forth. The sadhaka becomes devoid of all problems, mental and physical, and can ultimately attain self-realization, the perfect psycho-physiologically balanced state.

**Yoga meditation as therapeutic tool:** As a therapeutic intervention yoga meditation is the very process of recovering and retrieving our psycho-physiological and psychosocial integration that, otherwise, almost always remains under a constant demand from our psycho-physiological, psycho-social and bio-ecological phenomena.

The modern man is prone to emotional upheavals, almost every time, thanks to the economy based life style and erosion of humane values in the fast paced cyber environment today.

**Neuro-psychological perspectives of yoga meditation:** In yoga meditation, the compass of the attention phenomenon is expected to merge with the endless expanse, freeing the meditators from psycho-physiological, psychological and bio-ecological fixities. The parallel vigilance, evident within the body, makes the time ‘pervade through all directions’. The neutral state of attention thus attained, re-integrates our psycho-physiology towards normality through an enhanced sensory feedback within the body. Thus, it follows that all yoga meditative techniques necessarily have the transcendence phenomenon, denoting a freedom from all vagaries and conditionings of our body-mind complex.

**The need of meditation:** An ideal ‘balance’ between anabolism and catabolism spells a state of a complete psycho-physiological relaxation. Because of our not-so-ideal lifestyle we rarely experience this relaxed state. Relaxation is a complex phenomenon involving mind-body complex. Ancient Indian yogis have evolved practices like shavasana, makarasana and meditative practices to tackle psycho-physiological activation. Modern man remains almost
always in a state of continual psycho-physiological arousal, leading to psychosomatic disorders like peptic ulcer, skin disorders and eczema.

The kidneys, bladder, reproductive system, muscles, eyes, brain and lungs may also become susceptible to the associated disorders. The continual over-stimulation and physiological hyper-arousal might lead to an increased background activity in the mind. Thinking becomes less resourceful, leading to a lowered level of general awareness.

Orme Johnson terms the relaxation response experienced by meditation, as ‘stay & play’ response. Researches on T.M. have made it clear that those practicing T.M. were quickly habituated to galvanic skin response, which was reflected in their ‘cool response’ to fear-arousing situation over a period of time as compared to non-meditators.

It proves that relaxation response resulting from meditation is qualitatively different from the one obtained through conventional modes of entertainment.

**Cognitive-behavioral model of relaxation:** Smith (1988) has proposed an alternative model of relaxation based on cognitive behavioral principle as against the arousal-reduction model of relaxation that holds relaxation only as a reduced arousal. He states that practitioners of all forms of relaxation, be it autogenic training, Zen or breathing techniques, use honing and refining their ability to attend to a limited stimulus, ceasing goal-directed and analytical activity and tolerating and accepting experiences that may be uncertain, unfamiliar and paradoxical. Ornstein (1972) proposes that the practitioner of relaxation tends to experience a habituation of reaction, appraised as unimportant and continuous.

This model points out that different approaches may have quite different effects and therefore, clients should be given tailor-made techniques to cater to their needs. Additionally, yoga type stretching may serve as a good preparation for higher techniques like *omkar*, *pranayama* and *dhyana*. Carrington & Lichstein (1988) state that presentation of a rationale, an appropriate setting, detecting tensions, properly worded instructions, ongoing assessment, homework and differential relaxation are salient features of this model. Smith (1989) proposes that a diverse array of cognitive restructuring strategies can be incorporated into all facets of relaxation training. Thus, according to the Cognitive-Behavioral Model, relaxation can be much more than a physical or ‘mental relaxation’. Even though heart rate, respiratory rate and skin resistance may change favorably due to the added element of cognitive training.
in this model, deeper impact on one’s personality can amply be evident in the long run due to the basic principles of *passivity* and *receptivity* advocated in this model. The person is likely to report ‘I am centered; I am at peace’ instead of telling ‘I am relaxed and comfortable’.

**Yoga meditation i.e. dhyana:** In metaphysical terms, *dhyana* can be defined as “a process of purification at the level of existential awareness, whereby the sadhaka achieves reality perception by means of the object of meditation as well as transcends existential miseries as he approaches absolute joy and creative stance in all his existential endeavors”.

Let us analyze *dharana*, *dhyana* and *samadhi* through the following quotation of Dr Albert Ellis, the originator of *Rational Emotive Therapy*:

> “I love my work
> And I work at my loving
> That is the secret of my
> Present unusually happy state”

The first line of this quotation indicates *dharana*. The second line points towards the process of *dhyana* and the rest of the quotation helps understand the state of *samadhi.* *Self actualization*, held as the highest state of existential functioning, is also considered as a forerunner to one’s progress towards *self-realization*, whereby one progresses from phenomenal joy towards *transcendental joy*. This journey right from the stage of “mental focusing” is termed as *dharana*. In Vedantic thought an intent listening (*shravana*) can be likened to *dharana*. Contemplation (*manana*) along with the passive acceptance can be equated to the stage of *dhyana*, indicated through “*and I work at my loving*” as above. *Nididhyasana* of Vedanta can be likened to *samadhi*, a perfect existential state of psycho-physiological balance, whereby the transcendental nature of the object of *dhyana* is realized.

Swami Kuvalayananda (1930) has succinctly described the three stages of *vritti*, the mind stuff, being an intermingling of “*shabda*” the name, “*artha*” the object of concentration and “*pratyaya*”, the consciousness or awareness of the object, on the part of the person concentrating. Swamiji further says that in *dhyana* the *pratyaya* must be continuous, although occasionally it may be interrupted by *shabda* and *artha*. This is what Patanjali means by *pratyaya ekatanata*. In a wandering mind, however, *shabda*, *artha* and *pratyaya* are interrupting one another every now and then. In summary, Swamiji has emphasized
that *pratyaya* is abstract in nature and, therefore, is only suitable plank to latch on, if we aspire to realize our entry into *dhyana*, which occurs on the level of awareness and not on the mental level. In *samadhi* however, the awareness remains void-like (not actually void, though) indicating the awareness going *subtlest*. This premise was corroborated by experiments conducted on a yogi under his *laya samadhi*. While the yogi was in the state of *laya samadhi*, he was exposed to different sensory stimuli such as being pricked with a pin, touched with a cold piece of ice and the sound of a pistol shot. The EEG pattern remained unchanged signifying no influence of these stimuli on the level of consciousness. When queried about this experience later the yogi reported that he was fully aware about stimuli even while he was in the state of Samadhi. This experiment shows us that the meditator doesn’t become totally oblivious of the environment and still remains in touch with it. However this is to the minimal extent that enables them to be beyond its influence.

**Gita metaphysics on dhyana:** *Bhagwatgita* asserts that the *transcendental joy* removes all types of existential maladies and makes one’s intellect calm and stable (B.G.II:65), If one goes through all objects of senses by keeping attachment and antipathy at bay. The creative self thus fully canalized would help attain the *transcendental joy* (B.G.II:64). Dr Indrasen (1960) advocates therapeutic implications of what he termed ‘self existent’ and ‘objectless’ joy obtainable for psychiatric disorders.

The discussion, so far, points out that for *dhyana* to occur one needs an *equanimous, non-reactive, non anticipatory and decision free stance* of general awareness. It is interesting that neither *Bhagwatgita* nor *Patanjala Yoga Sutra* speaks of any particular technique of *dhyana*, though all basics of *dhyana* are available in these treatises. It follows that the concept of *dhyana* remains unchanged, while techniques may be very many. *Vijnana Bhairava Tantra* mentions more than hundred meditative techniques. Yoga meditation invariably leads one to an ‘absolute joy’. An adept meditator goes even beyond this state, through freeing oneself from “I-amness” and then experiences the state of *samadhi*.

**Salient features of yoga meditation:** Purification at the level of affect or feeling domain (*Bhava Shuddhi*): One of the most widely prevalent misconceptions regarding *dhyana* is *stopping of thoughts* as the sole criterion for entering into it. Any attempt at stopping thoughts often proves to be counter-productive. Therefore, along-with
transcending the thought processes the canalization of all functions of mind also is of paramount importance. Undue insistence on evidence or proof (pramana), inordinate tendency towards sleep (nidra), obsession to memory and reminiscences (smrīti), deluding self with available entertainment modes excessively (viparyaya) and farfetched imagination or fancy (vikalpa) should be avoided summarily in one’s journey towards canalization of all these basic urges and motives. Positive lifestyle changes thus realized, would go a long way towards achieving equanimity in all our endeavors. Thus, one becomes ready for the purification of feeling and experiencing phenomenon (bhava shuddhi). Kriya yoga is one of the numerous ways, mentioned in Patanjala Yoga Sutra for purifying the feeling domain of one’s personality most effectively. In one of the traditions, kriya yoga constitutes of ten rounds each of anuloma viloma pranayama, Omkar and Gayatri mantra. Thus bhava shuddhi is a pre-requisite for realizing the dhyana state. For the common man, idol worship, devotional songs and religious congregations have been found as most desirable and effective. Patanjala Yoga Sutra and Vijnana Bhairava Tantra mention many a secular practice for achieving the purification of one’s feeling domain.

Vyasa, the comentatator on Patanjala Yoga Sutra asserts that though the native nature of the mind stuff is yoga samadhi, the mind stuff flows either towards destructive propensities or towards the common good and virtuous purpose. However, in case of the common man the former direction is often adopted by the mind stuff. That is why, he/she is not able to, normally, actualize his very many human potentialities.

The process of bhava shuddhi, as mentioned above, endows one with continual & comprehensive awareness (viveka khyati) of the eternal realities and of our ‘divine nature’. In course of time, we even transcend the state of bliss or anandamaya kosha. This state helps us to be successful in both worldly and spiritual matters.

As per Shrimat Bhagwat (11:14:32-35), sagarbha pranayama with Omkar, followed by meditation on gross objects (sthula dhyana) is recommended before resorting to jyoti dhyana(meditation on effulgence) and akasha dhyana (meditation on the vast expanse). Bhagwat Gita speaks of transcending all kinds of affects and the feeling domain in one’s progress towards transcendental joy (B.G.II: 64)

Yoga meditation has two main streams: concentrative and mindfulness. In concentrative meditation, the stimulus habituation is evident whereby a single object, mantra, feeling or
concept is concentrated upon. Cognitive construing stops if the meditator steadfastly remains far and above any kind of judgment and expectation. This slows down the activities of the left brain and the right brain. Here, the meditator may experience the ‘dynamic state’ of transcendence. Del Monte has proposed a subjective point of transcendence once the meditator goes beyond the bipolar opposites such as aggression-submission, attachment-antipathy etc. During the advanced stages of meditation all analytical activities, thinking, visualization, imagery, memory etc. are gradually transcended. As a result, we go beyond all kinds of biases, prejudices and all such mental complexes. This culminates psycho-physiological relaxation. In mindfulness meditation, cognitive efforts become relaxed and the meditator trains himself through this process: to watch everything within and without with a neutral stance. Such a relaxed mental set prompts him to share his problems and experiences with the therapist in a tree and frank manner. This process helps him close on to the very genesis of existential disorders. In such a situation, he becomes mentally prepared to take advantage from psychotherapeutic methods like rational emotive therapy. As the meditator becomes more and more adept, he develops a reality perception that all worldly happenings are impermanent in nature. In the process, he starts ‘transcending’ respiration, thoughts and sensations, in that he does not get adversely affected by the associated worries, apprehension and anxieties in his daily life and living. As his psyche is now free and relaxed, he starts developing subtle experiences within. He starts now ‘knowing’ the mysteries of human mind as his very consciousness moves inwardly. Gradually, he develops an ‘inner strength’ and greater emotional stability that help him, in turn, through his worldly life and living, as well as bring him closer to the transcendence. It is quite important to note that almost all yoga meditative techniques use either of the two methods or a combination of both. In different times, in human history, men of wisdom have discovered different meditation techniques suitable to the peoples’ psyche in those times.

Researches done by Burrow (1950) and certain experiments conducted by Swami Kuvalayananda (1956) point out two main strata of meditative experiences. The first is the release phenomenon in the form of expression to repressed thoughts and wishes. The second is the elimination of deep rooted cognitive and emotional complexes from the meditator’s repertoire, leaving them “centered inwardly” and “blissful within”. In the second stratum, as above, the psycho-physiological parameters show a marked improvement as compared to that
of the first stratum. Yoga meditation, therefore, has the element of absolute-deep-serene joy within.

**General instructions for the process of dhyana:** Any one aspiring for meditative experiences can keep the following points in mind while meditating:

1. Your mind should be relaxed so as to welcome the memories, thoughts, emotions and feelings as they simply occur to you, without reacting to them in any way. A relaxed yet stable posture, sitting or supine should be assumed and maintained during the entire session. *Shiva Samhita* (V: 71, 72) mentions supine posture for *dhyana*.

2. Mental set should have a sense of purpose, yet one should not put any-stake mentally in case meditation does not happen at all.

3. Suspend your trying stance and mentally be in *an accepting mode*. If it helps, just feel *the entire expanse around* or *feel an ocean around*. Instead of resorting to imagery and imagination just “feel & feel an abstract way” with minimal of brain work.

4. Let the mind wander freely for a while, yet keep your “feeling mode” intact.

5. Just watch all trouble producing thoughts, memories and emotions with a neutral stance with a stance that *nothing is bad* and *nothing is good*. If you continue to feel all nagging thoughts, emotions and feelings, though this “neutral state of attention”, you will become non-reactive gradually, at least to some extent, to all happenings within and without.

6. Meanwhile just go on watching as to how do you feel within, in general!

7. This will train your attention to accept even the relaxation as it comes, without naming or defining it.

8. Thus, a yogic concentration or some ‘abstract comprehension’ of your state of being may dawn upon you.

9. If you feel any discomfort, apprehension or uneasiness or such not-so-desirable things happening to you, then simply allow some time to pass by, while remaining neutral internally, as far as possible for you.
10. If you remain ‘neutral’ for a while as mentioned in step 9, an absolute / transcendental joy might happen. You may allow your mind to wander for a while yet bring it slowly back to the neutral state of attention. You are likely to welcome meditation as it may occur and stay, while you continue to keep “neutral yet accepting stance” within.

A discernible reader may infer, with confidence, that yoga meditation enhances sensory feedback due to an enhanced awareness about all possible realities, as we break open all our conditionings and deep rooted psycho-physiological reactivities, fixities and impulsions. Naturally, an enhanced sensory feedback results in an enhanced process of homeostasis, on the psycho-physiological level.

Osho’s mystic rose meditation, vipassana, T.M., preksha and yoga nidra are some of the meditational techniques that have used yogic principles. Amongst the contemporary techniques, guided meditations have been found immensely practical because of their background guided instructions that can be easily accessed through CDS & DVDS. Lachnitt and Bhogal (2006) have proposed a holistic meditative technique which can, initially, be administered in a guided manner. Slowly, the meditator is then weaned away from guided instructions in due course of time and can then meditate independently without guided instructions.

**Holistic meditation (a guided meditative technique):**

1. Keep your glance on the floor, approximately 5-7 feet straight in front of you, with eyes partially open and blinking reflexes continuing as usual. Eyes may close all by their own accord, after a while.

2. Continue to feel the relaxation that already prevails in your eyes until the same gets spread on the whole body naturally, in a gradual manner.

3. At this stage your body may give you different signals such as discomfort, uneasiness, aches, pains and so on. Please continue to experience the same with a non-reactive stance.

4. If you feel the stage 3 above as unbearable. If you feel it is a bit too much for you to continue with the same, you may then come to lying supine posture any time.
5. In supine posture now, continue to experience whatever may be happening within the entire body. Your mental stance should, however, remain non-anticipatory, non-judge-mental and non-reactive.

6. Continue to be aware of all the parts of your body by letting a “parallel vigilance” continued throughout the body.

7. You may deepen further the body awareness with the help of such techniques as breathing awareness, sensations within the nose and so on.

8. Now continue to remain with the whole body awareness by using “both the legs & both the arms” technology.

9. As you continue with the whole body awareness, a soothing effect (or a kind of comfort) will ensue.

10. Simply go on watching the soothing effect (or comfort or whatever you name it) until the same becomes maximally deep and ecstatic. Now, continue to maintain the same as much as possible and as far as possible.

11. In case any kind of interference such as thoughts memories occur during this stage, just use “Suspend the process & let some time pass by” technology. The ecstatic experience will come back. Now you may come to sitting posture any time and 'experience the meditation’ for two more minutes before allowing your eyes to open.

References:


YOGA PRACTICES FOR PREVENTION & MANAGEMENT OF HYPERTENSION

Yogacharya Dr Ananda Balayogi Bhavanani

Stress is inevitable in the modern world because of the imbalance between the demands of one’s environment and one’s capabilities. In fact, it is the distress, which causes the problem and can be defined as every physical and mental tension that we experience as unpleasant. The environment today is more demanding. From childhood onwards, the development of capacities and capabilities of the individual is not able to keep pace with increase of demands on them. This gap in most cases goes on widening. The huge crowds at temples, churches and mosques in some way or the other are related to this imbalance. Everyone seems to be going there in order to beg or bribe the almighty to perform the balancing act.

When we talk of stress we must also remember that some amount of stress is necessary in order to bring out the best in us. However it is vital to learn how to manage stress and keep it under our control. It is important to also remember the words of Epictetus (60 A.D.) who said, "Men are not disturbed by things, but the views, they take of them". As Swamiji Gitananda Giri Guru Maharaj jocularly used to say “You don’t have problems—YOU are the problem!”

A positive frame of mind will help us to be cheerful and unstressed. Maharishi Patanjali’s advise in this regard to cultivate pratipaksha bhavanam (the opposite view) is vital to achieve balance of the emotions and mind. It is also worth trying to follow his advice of maitri-sukha (friendliness towards the happy), karuna-dukha (compassion towards the suffering), mudita-punya (cheerfulness towards the virtuous) and upekshanam-apunya (indifference towards the wicked).

The most common causes of stress are the shat ripus or the six enemies of the spirit. These are kama (uncontrolled passion), krodha (senseless anger), lobha (greed), moha (blind infatuation), mada (massive ego) and matsarya (malice / envy). Corruption of character, conduct, thought and interpersonal dealing is another cause of stress.

Programme Co-ordinator ACYTER, JIPMER and Chairman ICYER at Ananda Ashram, Pondicherry. www.icyer.com and www.rishiculture.org
An environment where sadistic pleasure gives satisfaction, where ethics have little or scant regard, where self-interest is more important, and where under cutting and backbiting are a common feature, will surely lead to the development of extreme stress.

It is important to realise these facts and be aware of them in our life. Unless we develop awareness and consciousness of what we think, feel and do, there cannot be a lasting solution to stress. We must strive to become persons of “Equal mindedness in all situations” that is described as sthita prajna or samabhava in Srimad Bhagavad Gita.

Though stress probably cannot be avoided, it can, however, be managed. The following actions may help reduce/eliminate the stress.

1. **Awareness**: It is important that we first become aware of the stress and then try to let it go. Sharing our tension with a friend and/or a family member may solve the problem to a great extent. You cannot wish away problems by non-acknowledgement of them.

2. **Movement**: Movement helps in reducing tension. This can mean walking, jumping, making noise, swimming and playing. Stress tends to accumulates in the joints and movement helps to dissipate it. Rotation of the neck and shoulders in many cases helps a lot. Some corporates have even established stress-relieving chambers where employees may shout, scream or hit a hanging pillow to relieve the pent up tension.

3. **Yoga techniques**: Regular practice of various yoga techniques and inculcating the yogic values in daily life will go a long way towards not only reducing the stress levels but also in giving us that elusive “peace of mind”. Yogic relaxation practices such as shavasana and yoga nidra help to create a sense of awareness and relaxation in the whole body as well as the mind.

4. **Hobby**: A hobby can help to relieve tension because it helps us to divert our mind from an unpleasant occurrence. Music, dance, painting, cooking and gardening are effective ways to take our mind to a different “zone”. Playing with your pet can also help relieve tension and many people have ‘thera-pets” or pets that help them therapeutically!

5. **Breathing**: Breathing is one of the easiest ways of relieving stress. Whenever you feel tension, take a few deep breaths and you will immediately feel the difference.
6. **Attitude:** It is important to “Let things lie” for sometime when facing problems and many situations resolve on their own. Other situations may appear smaller and less stressful after some time. Development of a detached attitude can also help us to have a better perception of situations and this in turn helps us to face them better.

7. **Visualization:** Visualization of a pleasant solution to the problems can also help a lot. This is quite different from day dreaming. This is widely adopted by players and athletes for improving their performance. After a stressful encounter, coolly sit in your chair, close your eyes and visualize the episode as an act of an ignorant person and excuse him for the incident.

8. **Auto-Suggestion:** Another mental technique is positive self-suggestion. The negative thoughts are to be replaced with positive ones and an attitude of ‘I can and I will’ is to be developed.

9. **Self effort:** Stress is related to the individual’s environment and his tolerance capacity. As both of these are different in different people, each individual has to settle for his own method for managing day-to-day problems. It must be clearly understood that we are responsible for our health and happiness and have a duty to take care of these Divine gifts. Swami Gitananda Giri used to often say, “health and happiness are your birthright”. It is through our own efforts and will power that we can ultimately solve the problem of stress and achieve our birthrights.

Yoga is an integrated way of life in which awareness and consciousness play a great part in guiding our spiritual evolution through life in the social system itself by understanding that "Yoga is the science and art of right-use-ness of body, emotions and mind".

**BASIC WARMING UP PRACTICES**

Jattis are basic movements of the body parts that help to release pent up tensions in those parts. They increase circulation to the part and also the flow of pranic energy is increased due to the movements.

A few of these practices will be described below. Take up a comfortable standing position such as the samasthiti asana.

Stand on one leg and shake the other leg. Repeat on the other side and then alternate a few times between right and left. Stand on both legs and start to shake your hands one at a time.
Alternate between the right and left a few times and then start to shake both hands at the same time. Shake your hands and move them up, down, to the left and to the right. Shake your hands all around you in a circular movement. This helps to energize the pranamaya kosha, our energy sheath or subtle body. Come back to the standing position.

Open the legs two feet apart and keep the hands on the hip. Move the torso in all four directions clock-wise and anti clock-wise in a grinding action. Then do it in a continuous manner. Bend forward and perform some toe touching with a bouncing action. Bounce to the front, and then move to your left. Move to your right and then come back to the front. Come back to the standing position.

Spread your feet a bit and lift both your arms to the side. Start to twist your torso from side to side a few times. Feel the stretch in your hip region and back. Come back to the standing position and relax with deep breathing for some time.

Sit down with both legs stretched out in front of you. Draw your right knee up to your chest and then kick out with a whooshing sound. Perform the same action on the left side. Continue to alternate legs for some time. Draw up both your knees and do the same action with a whooshing sound as you release the feet. Relax with your feet stretched out in front.

**YOGA ASANAS**

**Tala kriya:** The term, “tala” refers to a palmyra tree and you should try to stretch yourself as tall as that tree while performing this practice. Take up a comfortable and stable samasthiti asana. Breathe in and lift both arms up over your head until they are parallel to each other. Let the palms of both hands face inward and then go up onto your toes and stretch up as high as possible. Hold the breath and feel the healthy stretch along your whole body from toes to finger tips. Breathe out and relax your arms back to your sides while coming back to the flat foot posture. Repeat the practice two more times at each session for maximum benefit. With practice the posture can be held for a longer time and normal breathing done while holding the posture for 30 to 45 seconds.
**Hastha kona kriya:** Stand in a steady samasthiti asana with your arms by your side. Breathe in and lift your right arm over your head. Try to extend the arm over your head towards the left as far as possible without bending it. This gives a good stretch to the entire right side of the body. Slowly start to breathe out and lower your arm slowly back to the side. Repeat the practice a few more times.

Make sure that you lift your arm on the in breath and lower it on the out breath. Perform the practice on the opposite side by lifting your left arm over your head while breathing in. Extend it as far towards the right as possible without bending it. Feel the excellent stretch on the entire left side of your body. Lower your arm back to your side while breathing out. Repeat the practice a few more times.

The hastha kona kriya helps to stretch and tone up the musculature of the arms, shoulders and the para-spinal area in a way not done in day-to-day life. This helps trigger the relaxation response in these tissues that are normally tensed due to disuse, misuse and abuse. A sense of profound relaxation is obtained after the practice of this activity that is also known as the ardha kati chakrasana.

**Trikona asana:** Stand in samasthiti asana. Place your feet two to three feet apart facing forwards. Stretch your arms to the sides so that they are pulling the chest in opposite directions. Turn your head and right foot to the right side and slowly bring your right hand down to the right foot and place the palm of the right hand on the ground in front of the right foot. Look up at the middle finger of the left hand. Let the entire torso get a good twist and stretch.

Hold the position for 30 seconds while performing deep breathing. Release and come back up to the open arm position and then do the opposite side by placing your left hand down in front of the left foot. Hold the position for 30 seconds while performing deep breathing. When ready come back up to the samasthiti asana and relax with a few rounds of deep breathing.
**Meru asana:** This head below the heart posture may help reset the baroreceptor sensitivity as well as re-orient the flow of energy in the psycho-neuro-immuno-endocrine axis.

From samasthiti bend forward and perform the mountain posture. Straighten your knees and raise your buttocks up until the soles of both your feet are flat the ground. Keep your hands and feet in parallel so that the right hand and right leg as well as the left hand and leg are in a single line. Try to push your head in towards your abdomen and look at your navel. Perform a few rounds of regular breathing while holding the pose and contemplate the steadiness and might of a huge mountain. When ready release the pose and come back up to the standing posture.

**Sukha asana:** To perform sukha asana, the pleasant posture, sit on the ground with both your legs stretched out in front. Bend your left knee and then your right to pull the legs in and sit with your legs crossed at the ankles. Clasp your hands together to form the yoga mudra with fingers of your right hand dominant over the left. Sit straight and perform deep and controlled breathing. Sukha asana, the comfortable posture is an excellent pose for relaxation, concentration and meditation. It can be performed by most people in spite of their stressed out physical condition that prevents them from attaining to more complicated sitting postures. Perform the sukha pranayama by breathing in and out for an equal count of 6 while sitting in this comfortable posture.

**Vakra asana:** Sit erect with your legs stretched out in the uttana asana. Bend your right knee and place the right foot by the side of the left knee. Turn to your right and place your right hand on the ground behind you to position. Bring your left arm round the right knee and catch hold of the right head and look back over your right knee acts as a fulcrum for getting the spine. Keep your torso as straight as posture for 30 seconds with soft breathing.
Release the posture and come back to the uttana asana. This posture gives an excellent massage to the abdominal organs and is very useful for those suffering from diabetes as well as digestive disorders. It is also useful for neck and back problems. Repeat the practice on the opposite side in a similar manner. Hold the posture for 30 seconds with soft breathing. Release the posture and come back to the uttana asana and relax with deep breathing for some time.

**Vyagraha pranayama:** Take up the chatu pada asana with your weight evenly distributed between your hands and knees. Start breathing in and out for an equal count of six. While breathing in slowly lift your head and arch your back downwards. Then breathe out slowly and lower your head while arching your back upwards. Breathe in while lifting your head and arch your back down.

Breathe out while lowering your head and arching your back up. Repeat this excellent practice at least nine times at each session. Vyagraha pranayama helps us to utilize all sections of our lungs in a balanced and controlled manner thus energizing the whole body with healing pranic energy. When ready slowly relax back to the vajrasana for a period of quiet contemplation.

**Bhujangini mudra:** To perform the cobra gesture, take up the unmukha asana which is a prone position with your entire body in a straight line. In this technique the emphasis is on the breathing pattern and the production of a mighty hissing sound through the clenched teeth. Slowly bring your arms forward and keep your palms on the ground alongside your shoulders. Take in a deep breath.

While making a mighty hissing sound, flare back into the bhujanga asana. Slowly relax back onto the floor while breathing in and then again flare back with a mighty hiss. Repeat this mudra at least three to six times at each session. This technique helps release the pent up stress that accumulates in our system from our daily life and provides great emotional and mental relief.
It is an excellent stress-buster and is a must for all in this day and age. After completing the practice come back down to the face prone pose. Place your arms alongside your body and turn your head to the side. Relax for a few minutes and let the benefit of this mudra seep into each and every cell of your body.

**Eka pada uttanpada asana:** From shavasana lift your right leg up towards the sky on the in breath. Try not to bend the knee if possible. On the out breath lower the leg back to the ground. Use a breath cycle of in and out for a count of six or eight. Repeat this two more times. Perform the same practice on the left side. Lift your left leg up towards the sky on the in breath. Try not to bend the knee if possible. On the out breath lower the leg back to the ground. Use a breath cycle of in and out for a count of six or eight. Repeat this two more times. After performing the practice at least three times on each side relax in shavasana with deep breathing.

**Dwi pada uttanpada asana:** From shavasana lift both legs up towards the sky on the in breath. Try not to bend the knees if possible. On the out breath lower the legs back to the ground. Use a breath cycle of in and out for a count of six or eight. Repeat this two more times and then relax in shavasana with deep breathing. Those who have back problems should not do straight leg lifting and should do it with bent knees instead to avoid increasing the strain on the back.

**Pawana mukta asana:** Lie down in a comfortable shavasana and start to breathe in and out for an equal count of six or eight. To perform the single legged ekapada pawana mukta asana bend and lift your right knee while breathing in and simultaneously also lift your head off the ground. Catch hold of your knee with your arms and try to touch your knee to your forehead.

Hold the position a few seconds and then while breathing out slowly release the position and lower your head while at the same time bringing your foot back to the
ground. Repeat this at least two more times to complete a set of three rounds of the practice. Relax a few seconds in the shavasana and then perform the practice on the left side. Relax in shavasana for a few minutes with deep and rhythmic breathing while concentrating on your abdominal area that will help to relax you further.

To perform the double legged dwi pada pawana mukta asana, bend and lift both your knees while breathing in. Bring them as close to your forehead as possible while simultaneously raising your head to meet the knees. Hold a few seconds and then while breathing out, lower your head and simultaneously bring your feet back to the ground. Repeat this two more times to complete a set of three rounds at each session.

Relax in shavasana for a few minutes with deep and rhythmic breathing while concentrating on your abdominal area. This will help you to relax even further as the emotional tensions tend to tighten up the abdominal area leading to a feeling of “butterflies in the stomach”.

**Shavasana with savitri pranayama:** Lie supine on the ground with your head preferably to the north enabling your body to be in alignment with the earth’s electromagnetic field. Make sure that your head and body are in a straight line while hands are kept relaxed by side with palms facing upwards. Bring your feet together and let forefeet fall away into a ‘v’ shape with heels as close together as possible.

Start to consciously watch your breath by letting your awareness settle in the abdominal area. Feel the abdominal movements as your abdomen rises as you breathe in and falls as you breathe out. After a few rounds of this practice, slowly let your awareness settle at the tip of your nose. Feel the cool inspired air flowing into your nostrils as you breathe in and become aware of the warm expired air flowing out of the nostrils when you breathe out.

Consciously regulate your breath so that the duration of the incoming and outgoing breathes are equal. The inspiration and expiration can be for a count of 4 or 6 initially and then with practice elongated to a count of 8 or 10. Perform at least nine rounds of this conscious deep breathing and enjoy the relaxed sensation that spreads throughout your body.
The relaxation in shavasana can be further depended by utilizing the savitri pranayama to relax and rejuvenate your body, emotions and mind. Breathe in through your nose for a count of 6. Hold in the breath for a count of 3. Breathe out through your nose for a count of 6. Finally hold the breath out for a count of 3. Make sure that you are breathing in and out through both nostrils and that you are using the complete yogic breathing. Perform at least 9 rounds of this combination practice that heightens the relaxation to a very deep level.

After performing 10 to 15 minutes of the shavasana slowly start to move your fingers and toes. Perform conscious stretching and make a smooth transition from the relaxed to the active state. Lift your left arm over your head and turn over onto your left side. Continue the turning action until you come into the face-prone posture. Perform makara asana by placing your right hand on the left while the left is placed palm down on the ground in front of you. Keep your forehead or chin on your right hand while keeping your legs a foot apart.

Bring your hands forward near your shoulders and push yourself back into the bhujanga asana. Continue the back bending movement and go into the four footed chatus pada asana. Relax into the shashanga asana with your arms stretched out in front and then finally come back to the vajrasana. With your palms on your thighs sit quietly for some time and enjoy the effects of the deep relaxation that has spread to every part of your body.

**Spanda – nishpanda kriya:** This practice is done from shavasana using the yogic concept of spanda nishpanda, which means the coupling of tension and relaxation. We consciously tense different parts of our body as much as possible and then relax them to the maximum in a step-by-step manner. This produces a better relaxation response than the mere attempt to relax without putting in the initial effort of tension.

Lie down in a comfortable supine shavasana with your entire body in a single straight line. After a few seconds of relaxation in this position, start to tense your entire body part-by-part from your toes up to the top of your head until every part of your body is as tense as possible. Hold this 100% tension state of ‘spanda’ for a few seconds. Let all the muscles of your entire body be as tense as possible. At the peak of the tension, just ‘let go’ and immediately relax your entire body 100%. This is the state of ‘nishpanda’. Enjoy this relaxed state and with conscious awareness continue to watch your breath as it comes in and goes out of your nose.
Repeat this practice again by tensing up your entire musculoskeletal system to the state of ‘spanda’ and hold it for a few seconds. When ready let go completely and enjoy the ‘nishpanda’ state for a few minutes.

To complete the practice repeat the spanda-nishpanda kriya a third time by tensing up your entire musculoskeletal system from your toes to the top of your head. Hold the complete tension for a few seconds. When ready let go completely and enjoy the complete relaxation that ensures. Be aware of how all your muscles relax in this practice because the relaxation is deepened when it is contrasted with tension.

This practice is a boon for those suffering psychosomatic, stress induced and stress aggravated disorders such as hypertension, diabetes, asthma, insomnia, peptic ulcers and bowel disorders.

**Marmanasthanam kriya:** The twenty-two sensitive parts of the body are known by the collective Sanskrit term marmanasthanam. To concentrate upon these parts in a particular order or to command these areas to relax in a particular way while concentrating, gives a very satisfactory, deep relaxation that has been found by tested experiments to give relief even to compulsive dreaming. This is an excellent kriya to do at the end of a strenuous session of asanas and pranayamas. The relaxation should be preceded by at least nine rounds of savitri pranayama, the rhythmic breath, to create the proper atmosphere.

This technique can be done in two ways, one for relaxation the other for deep concentration. For relaxation the technique is done from “feet to the head” while for deep concentration from “head to feet”. While concentrating upon twenty-two body parts, each part is commanded (by mind) “to relax” or a thought of “peace or serenity” directed to the areas.

For relaxation, concentrate upon the (1) toes and command the toes to relax (2) feet (3) lower legs to knees (4) upper legs to hips (5) buttocks (6) base of spine (7) pelvic area (8) abdomen (9) chest and (10) shoulders. Now take your concentration down to the (11) fingers, and command the fingers to relax then (12) hands (13) lower arms to elbows (14) upper arms to shoulders where your concentration joins with body concentration (15) throat (neck) (16) around the mouth and chin (17) around the nose and cheeks (18) eyes (19) back around the ears (20) back of the head (21) top of the head (22) cavernous plexus in the middle of the forehead. All the while you should command “relaxation”.

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Perform jyoti dharana and jyoti dhyana (concentration and meditation on the divine light) at the bhrumadhya bindu (midpoint between the eyebrows). Visualize the divine jyoti to be having the brilliance equal to 1000 suns but without the glare. Absorb yourself into this divine jyoti.

**PRANAYAMA PRACTICES**

**Pranava pranayama:** ‘*Tasya vachakah pranavah*’, the sacred sound of the divine is the pranava says Maharishi Patanjali. This practice develops the abdominal, thoracic and clavicular regions of the lungs to their maximum capacity.

Pranava pranayama has unlimited healing potential and is useful in virtually all disorders. It brings about harmony of body, emotions and mind and is an important part of Rishiculture Ashtanga Yoga tradition as taught by Yogamaharishi Dr Swami Gitananda Giri Guru Maharaj.

Adham pranayama, the abdominal or lower chest breathing. Put the fingers into the chin mudra with the index and thumb fingers touching each other at the tips. Keep the other three fingers straight and united. Take a deep breath into the lower chest and abdominal regions..1..2..3..4. Now let out the breath with the sound aaa……

To perform thoracic or mid-chest breathing, the madhyam pranayama, curl your fingers inward to form chinmaya mudra. Take a deep breath into the mid chest and thoracic regions 1…2…3…4 . Now breathe out with the sound ooo……

Adyam pranayama is the clavicular or upper chest breathing and utilises adhi mudra. Clench your fists with your thumb in the centre. Keep the adhi mudra on your thighs and breathe deeply into the upper chest and clavicular regions 1…2…3…4… Now, exhale with the sound mmm……

Joining the earlier three parts of the breath in a complete yogic breath is the fourth stage, known was mahat yoga pranayama. Put the adhi mudra with knuckles of your right and left
hands touching in front of the navel. This is now known as the brahma mudra. Take a deep
breath into the low 1…2…mid 3…4…and upper chest 5…6…regions. Now let the breath
out with the sounds of aaa…ooo…mmm….

Relax in VAJRASAN and enjoy the feeling of potent healing energy flow through the
entire body.

**Nasarga mukha bhastrika:** Nasarga mukha bhastrika is a forceful expulsion of the breath
through the mouth that can accompany different movements to relieve our pent up stress.
Take up a comfortable standing position and then start to shake your hands as vigorously as
possible to help loosen up the accumulated tensions of your daily life. Visualize all the
tensions that have accumulated in your wrist and elbow joints getting a good ‘shake up’ by
this action.

When you have got the tensions loosened up, take in a deep breath through your nose and
clench your fist as if catching hold of all your tensions and stress. Now with a powerful blast
through your mouth "whoosh" away all your accumulated tensions and stress as forcibly as
possible. Again shake your hands as fast as possible. Breathe in and catch hold of the tension
in your fist. Throw it all away with a blast. Make sure that you are using your diaphragm
muscle vigorously while blasting out the breath in this practice.

Perform this practice 3, 6 or 9 times as necessary. After performing 3 to 9 rounds of this
practice, relax in the standing position and enjoy the feeling of relief that sweeps through
your arms as you relax with some deep breathing.

**Chandra nadi pranayama:** Sit in vajrasana and perform nasika mudra
with your right hand. Close your right nostril with your thumb. Inhale
slowly through your left nostril for a count of four. Now exhale through
the same left nostril for a count of eight.

Keep your right nostril closed throughout the duration of the practice.
Repeat the chandra nadi pranayama for a minimum of nine rounds at each session. Patients
of anxiety, hypertension, insomnia and other stressful conditions can benefit by practising
this pranayama 27 times before breakfast, lunch, dinner and before going to bed at night.
**Bhramari pranayama:** Sit on the heels in the vajrasana with the spine erect. Perform the shanmuki mudra with the thumbs of the hands closing the external auditory canal. The first two fingers are then placed over the closed eyelids while the ring fingers regulate the flow of air through the nostrils. The little fingers are placed over the closed lips. This mudra helps in joining together the nerves of the hands with the facial and trigeminal nerves on the face.

Take a slow and deep breath in for six counts. Let out the breath very slowly while making a sound in the nasal passages like the high-pitched sound of a female bee. This buzzing sound is very much like the anuswarah sound of “mmm” of the pranava AUM. Repeat this at least nine times. Bhramari is one of the swara pranayamas and stimulates the secretions and tones up nerve centres. This helps relive pitta conditions and rejuvenates the skin. It also creates a beautiful voice. It is a contemplative prelude to nada yoga.

**CONTEMPLATIVE PRACTICES**

**Prana dharana (breath awareness):** Sit in vajrasana or lie down in shavasana. Begin to be aware of your breathing and how the air passes down from the nostrils into the lungs and then back out the nostrils. Feel the abdominal movements as the abdomen rises with the in breath and falls with the out breath. Let your awareness settle in the abdomen. Feel the cool inspired air flowing into the nostrils and the warm expired air flowing out of the nostrils. Let your awareness settle at the tip of the nose. Consciously regulate the breath so that the ratio of inspiration and expiration is equal. It can be a 4, 6, 8 or 10 count. Perform nine rounds of this practice.

**Mindfulness based meditation:** One of the most productive of the many forms of “quiet sitting”, popularly grouped under the heading of meditation is the mindfulness based awareness of one’s thoughts. This is to be done without identifying with the thoughts and without either justifying or condemning them.

Take up a straight back sitting position and sit facing to the north or east in the early morning. Keep your mind as placid as possible, as this is the important feature of the early morning meditation. Breathe slowly and rhythmically, but very quietly. Do not upset the peace. Hold your mind concentrated inside your head at a point in line with the eyebrows. Relax. Don’t attempt to force visualization, simply be alert and expectant.
Presently, you will have the sensation of movement within the head, as though watching a “ticker tape” of your thoughts. The thoughts will be in extreme slow motion. Observe the thoughts. Don’t get emotionally involved with them, just watch them. You will actually be able to see your thoughts, as well as hear them. Usually, the thoughts are quite mundane, but benign. Simply observe them, passively and dispassionately.

**Om japa:** Take up any meditative posture and start to perform the savitri pranayama in a 6 by 3 or 8 by 4 rhythm. Make an audible pranava AUM in the bindu nadi. With japa-ajapa, make silent intonation of the pranava AUM concentrating at this same point. Do not let the mind waver away from either a conscious repetition of the mantra AUM, as japa, or as the silent ajapa.

**Ajapa japa:** Take up any meditative posture and start to perform the savitri pranayama in a 6 by 3 or 8 by 4 rhythm. As you breathe in listen to the sound of ‘sah’ made as the breath enters your respiratory passages. As you breathe out listen to the sound of ‘hum’ that is made as the breath leaves your respiratory passages. Concentrate on this ajapa japa of *hamsa soham* in tune with the breath.
INTRODUCTION TO ACYTER

The Advanced Centre for Yoga Therapy Education and Research (ACYTER), a collaborative venture between JIPMER, Puducherry and Morarji Desai National Institute of Yoga (MDNIY), New Delhi was established by MOU between JIPMER and MDNIY on 7 June 2008. This advanced centre will focus primarily on the role of yoga in the prevention and management of cardiovascular disorders and diabetes mellitus. Dr Madanmohan, Professor and Head, Department of Physiology, JIPMER is the Programme Director.

AIMS & OBJECTIVES

- To bridge the gap between yoga and modern medicine
- To introduce yoga in medical curriculum and facilitate an awareness of the therapeutic potential of yoga amongst the medical professionals
- To provide quality yoga and lifestyle consultation and standardized yoga therapy to patients of JIPMER
- To conduct collaborative research projects with MDNIY
- To conduct seminars, workshops, symposia and conferences
- To standardize yoga techniques and procedures
- To conduct yoga classes for JIPMER staff, students and general public
- To create an awareness about the art and science of yoga amongst the people of Pondicherry and surrounding regions
SERVICES OFFERED THROUGH ACYTER

Yoga therapy OPD is functioning in Super Specialty Block of JIPMER. Yoga therapy and lifestyle consultation is given by Dr Ananda Balayogi Bhavanani, Programme co-ordinator and Dr Zeena Sanjay, SRF from 10 AM to 1 PM on Monday, Wednesday and Friday and 10 AM to 4 PM on Tuesday and Thursday. 4036 patients of various psychosomatic ailments includes diabetes mellitus, hypertension, musculoskeletal disorders, respiratory disorders, stress and psychological disorders, endocrine disorders, coronary artery disease, urology, gynecological disorders and ENT disorders have attended consultations and therapy sessions between June 2009 and June 2010.

Yoga therapy sessions for diabetes and cardiovascular diseases are being conducted from 10 AM to 1 PM on Monday, Wednesday and Friday at the ACYTER Yoga Hall situated in 3rd floor of institute block. The sessions are supervised by Sri E Jayasettiaeloon, SRF.

A senior citizen clinic is being conducted every Thursday from 11 AM to 12 noon and Mrs. Meena Ramanathan, Guest faculty is conducting the special sessions that have been well appreciated by the senior citizens of Pondicherry. 377 participants attended these sessions between June 2009 and June 2010.

Regular yoga classes are being conducted from 6.30 to 7.30 AM and 4.30 to 5.30 PM on Monday, Wednesday and Friday at the ACYTER Yoga Hall situated in 3rd floor of institute block. 490 participants attended these sessions between June 2009 and June 2010. Sri G Dayanidy and Selvi L Vithiyalakshmi, Yoga instructors are conducting the classes for JIPMER staff, students and their family members.

ACTIVITIES OF ACYTER

ACYTER has been active in conducting Yoga training for medical students, organizing a mass awareness programme in 48 schools of Puducherry and organized a National Workshop on “Introducing Yoga in Medical Curriculum” in March 2009. Regular academic programmes are being held every Saturday and three foreign delegations from Australia and New Zealand, Belgium and Germany have visited ACYTER and participated in the activities during 2009.
Yoga awareness programmes have been conducted for staff and students of the Government Dental College and for participants of the Nursing Workshops on AIDS at the JIPMER Nursing College. ACYTER also conducted yoga and healthy lifestyle consultations for the delegates attending the Regional Official Language Conference for South and South Western Zone at JIPMER in October 2009 and the 17 International Yoga Festival conducted by Department of Tourism, Government of Pondicherry in January 2010.

ACYTER organized a workshop on Chakra Meditation for Healing by Sri Balaratnam, founder Vibrational Breath Therapy Melbourne, Australia on 1 January 2010. Dr Madanmohan, Programme Director, Dr Ananda Balayogi Bhavanani, Programme Coordinator and staff members ACYTER participated actively in the 17 International Yoga Festival conducted by Tourism Department, Government of Puducherry at Sri Subulakshmi Mahal from January 4 to 7 2010.


Programme Director and, Programme Co-ordinator were invited speakers for the National Yoga Week 2010 organized by MDNIY at New Delhi from February 12 to 18. Programme Director chaired a session on “Yoga for Cardiovascular Health” while Programme Co-ordinator conducted a workshop on “Yoga for Technostress” in collaboration with staff of MDNIY. Shri E Jayasettia seelon, SRF and Shri G Dayanidy, yoga instructor participated in the conference, seminar and workshop organized during the week long programme at MDNIY.

Programme Co-ordinator presented an invited talk on “Yoga: A boon for maternal and child health” at Mother Theresa Institute for Health Science as part of the State Level Champaign for mother and child health organized by the Directorate of Indian Systems of Medicine and Homeopathy, Government of Pondicherry on 23 February 2010. All the participants and eminent experts of modern medicine and alternative medicine who were present on the occasion appreciated the presentation that highlighted the importance of yoga in both antenatal and postal natal care.
Special classes on yoga for antenatal and postnatal health were conducted on 23 and 24 February for students of final year B.Sc Nursing at the JIPMER Nursing College. The classes were conducted by Selvi Vithiyalakshmi, yoga instructor while Programme Co-ordinator gave a theory session highlighting important yoga practices for both antenatal and postnatal care. More than 50 students participated in the classes enthusiastically.

Programme Co-ordinator presented invited talks on “Bridging yoga and modern medicine” and “Yoga research-where are we?” during the Seminar on Yoga for Doctors organized and conducted at Kaivalyadhama, Lonavla, Maharashtra on 26 and 27 February 2010.

ACYTER and Department of Physiology, JIPMER organized a two day National Workshop-cum-Seminar on “Role of Yoga in Prevention and Management of Hypertension” on 18 and 19 March 2010 at JIPMER. The workshop was organized in collaboration with Morarji Desai National Institute of Yoga (MDNIY), New Delhi, an autonomous organization under the Department of AYUSH, Ministry of Health and Family Welfare, Govt. of India. The workshop was inaugurated by Dr KSVK Subba Rao, Director JIPMER and Dr AK Das, Medical Superintendent, JIPMER was guest of honour. Senior faculty members from various departments of JIPMER as well as eminent yoga and medical experts from all over the country participated in the inaugural function.

The workshop deliberated on the role of yoga in the prevention and management of hypertension with keynote lectures, invited talks, lecture-demonstrations, panel discussions and practice sessions that were given by a team of 27 resource persons from JIPMER, DIPAS, Krishnamacharya Yoga Mandiram, Iyengar Yogashraya, Sikkim, Kaivalyadhama and the International Centre for Yoga Education and Research (ICYER). Nearly 200 participants including medical, paramedical & yoga professionals from all over the country attended the workshop along with 100 first year medical students of JIPMER.

**RESEARCH WORK AT ACYTER**

Dr Madanmohan, Programme Director, ACYTER has submitted two research proposal to the JIPMER Research Council. The first proposal entitled, “Effect of Yoga therapy on patients of type II diabetes mellitus with neuropathy” plans to investigate the physiological, biochemical, psychological and clinical effects of 6 months yoga therapy in patients of diabetes
mellitus with neuropathy. The second proposal entitled “Effect of yoga therapy on autonomic function and biochemical profile of patients of essential hypertension” plans to investigate the autonomic and biochemical effects of 6 months yoga therapy in patients of essential hypertension.

Staff members of ACYTER have conducted short-term pilot studies on different applications of yoga in 2009-10.

Studies that have been conducted till date are:

- Immediate effect of sukha pranayama on heart rate and blood pressure of patients with hypertension
- Immediate cardiovascular effects of kaya kriya in normal healthy volunteers
- Immediate effect of shavasana and savitri pranayama on heart rate and blood pressure of hypertensive patients
- Immediate effect of chandra nadi pranayama on heart rate and blood pressure of hypertensive patients
- Immediate cardiovascular effects of shavasana and pranava pranayama on heart rate and blood pressure of hypertensive patients
- Immediate effects of yoga nidra on heart rate and blood pressure
- Immediate effect of yoga practices on blood pressure

Other studies are being conducted at present by staff members and residents of Department of Physiology and staff of ACYTER in patients of diabetes mellitus and hypertension.
REPORT ON PILOT STUDIES AT ACYTER

Various pilot studies have been done by ACYTER staff under the direction of Dr Madanmohan, Programme Director ACYTER. The following studies have been conducted by Shri Jayasettiaseelon SRF, Dr Zeena Sanjay SRF, Shri G Dayanidy, Yoga Instructor and Selvi Vithiyalakshmi Yoga Instructor and coordinated by Dr Ananda Balayogi Bhavanani, Programme Co-ordinator.

1. IMMEDIATE EFFECT OF SUKHA PRANAYAMA ON HEART RATE AND BLOOD PRESSURE OF PATIENTS WITH HYPERTENSION

Introduction: Hypertension is one of the most common health disorders and yoga has been shown to be an effective adjunct therapy in its management. Earlier two studies from our laboratories have demonstrated heart rate (HR) and blood pressure (BP) lowering effects of slow, deep breathing after 3 weeks and 3 months of training. Beneficial effects of deep breathing in reducing premature ventricular complexes have also been reported by us. With this background, the present study was undertaken to determine the immediate effects of sukhā pranayama on cardiovascular parameters in hypertensive patients.

Methods: 23 hypertensive patients attending the Yoga OPD at JIPMER were instructed to perform sukhā pranayama for five minutes at the rate of 6 breaths / minute. Sukha pranayama is a slow and deep pattern of breathing where inhalation and exhalation are of equal duration. HR and BP were recorded before and immediately after the intervention. Rate-pressure product (RPP) and double product (Do P) were derived by formulae.

Results: Sukha pranayama produced a significant (p<0.05) reduction in HR from 79.5 ± 3.09 to 78 ± 3.24 beats/min and a highly significant (p< 0.001) reduction in systolic pressure from 132.5 ± 5.45 to 123 ± 3.83 mmHg. Pulse pressure decreased from 61.5 ± 3.39 to 52.5 ± 2.21 mm Hg, mean arterial pressure from 91.5 ± 3.19 to 88 ± 2.35 mm Hg, RPP from 107.28 ± 8.43 to 97.37 ± 6.97 units and Do P from 73.88 ± 53.72 to 69.52 ± 46.94 units, all these changes being statistically significant (P<0.001).

Discussion and conclusion: It is concluded that sukhā pranayama breathing at the rate of 6 breaths / minute can reduce HR and BP in hypertensive patients within five minutes of the practice. This may be due to normalization of autonomic cardiovascular rhythms as a result of increased vagal modulation and /or decreased sympathetic activity. Further studies are required to understand the possible mechanisms underlying this beneficial effect in hypertensive patients.

2. IMMEDIATE CARDIOVASCULAR EFFECTS OF KAYA KRIYA IN NORMAL HEALTHY VOLUNTEERS

Introduction: Kaya kriya is a dynamic hatha yoga relaxation practice. It may have psychosomatic harmonizing potential as it combines movement of different parts of the body with deep breathing in the supine position. The present study was undertaken to determine immediate effects of kaya kriya on cardiovascular parameters in normal subjects.

Methods: 12 normal subjects were instructed to perform kaya kriya for 10 minutes. Heart rate (HR) and blood pressure (BP) were measured with non-invasive semi-automatic BP
monitor before and immediately after the practice. Rate-pressure product (RPP) and double product (Do P) were derived by formulae.

**Results:** There was significant (p< 0.01) reduction in systolic pressure from 112.25±2.91 to 108.83±2.69 mmHg, diastolic pressure from 71.25 ± 1.72 to 68.17± 1.29 mmHg and mean pressure from 84.92±1.93 to 81.72±1.57 mmHg and an appreciable fall in HR from 72.33 ± 3.62 to 69.67 ± 3.29 beats/min. RPP decreased from 81.29 ± 4.97 to 75.84 ± 4.17 units and Do P from 61.55 ± 3.80 to 56.95 ± 2.97 units (p=0.06).

**Discussion and conclusion:** It is concluded that 10 minutes of *kaya kriya* relaxation produces a significant reduction in BP. This may be due to a normalization of autonomic cardiovascular rhythms as a result of increased vagal modulation, and /or decreased sympathetic activity. Further studies with more subjects with control group and in different health conditions are required to understand the possible mechanisms underlying this beneficial effect.

3. IMMEDIATE EFFECT OF SHAVASANA AND SAVITRI PRANAYAMA ON HEART RATE AND BLOOD PRESSURE OF HYPERTENSIVE PATIENTS

**Introduction:** Yoga has been shown to be an effective adjunct therapy in the management of hypertension. Earlier studies from our laboratories have shown beneficial effects of *savitri pranayama* in normal subjects. *Savitri pranayama* involves slow and deep breathing in the ratio 2:1:2:1 and has been studied in combination with other practices in hypertensive patients. The present study was undertaken to determine immediate effects of *savitri pranayama* and *shavasana* on cardiovascular parameters in hypertensive patients.

**Methods:** 6 hypertensive patients attending Yoga therapy sessions at ACYTER were recruited for this study. They were instructed to lie down in *shavasana* and perform *savitri pranayam* for 10 minutes. Heart rate (HR) and blood pressure (BP) were recorded before and immediately after the intervention. Rate-pressure product (RPP) and double product (Do P) were derived by formulae.

**Results:** Statistical analysis revealed a highly significant (p < 0.001) reduction in mean pressure from 90.33 ± 1.77 to 85.11 ± 1.67 mmHg and Do P from 73.91 ±6.23 to 65.35 ± 5.69 units. There was a significant (p < 0.01) reduction in HR from 81.50 ± 5.84 to 76.50 ± 5.78 beats/min, systolic pressure from 125.67 ± 4.42 to 117 ± 3.89 mmHg and RPP from 102.24 ± 7.58 to 92.20 ± 6.46 units. Diastolic pressure decreased from 72.67 ± 2.74 to 69.17 ± 2.74 mmHg, the decrease being statistically significant (p < 0.05).

**Discussion and conclusion:** It is concluded that 10 minutes of *shavasana* with *savitri pranayama* reduces HR and BP implying normalization of the cardiovascular autonomic regulatory mechanisms with increased vagal modulation and / or decreased sympathetic activity. Reduction in RPP and Do P signifies reduction in oxygen consumption and work done by the heart. Further studies with more subjects and control groups are required to understand possible mechanisms underlying this immediate and beneficial effect in hypertensive patients.
4. IMMEDIATE EFFECT OF CHANDRA NADI PRANAYAMA ON HEART RATE AND BLOOD PRESSURE OF HYPERTENSIVE PATIENTS

Introduction: Yoga therapists routinely use *chandra nadi pranayama* to help reduce blood pressure (BP) in hypertensive patients. This is attributed to its stress lowering effects that have been documented by previous studies. Though there are some studies on the long term effect of *chandra nadi pranayama*, there are no studies on its immediate effect on cardiovascular parameters in hypertensive patients.

Methods: 26 hypertensive patients attending yoga OPD at JIPMER were recruited for the study. They were taught *chandra nadi pranayama* and instructed to perform the same for five minutes in sitting position. Heart rate (HR) and BP were recorded with non-invasive automatic BP apparatus before and immediately after the practice of *chandra nadi pranayama*. Rate-pressure product (RPP) and double product (Do P) were derived by formulae.

Results: There was a significant (*p* < 0.001) reduction in HR from 75.5 ± 2.78 to 70 ± 2.72 beats/min, RPP from 106.15 ± 4.53 to 96.06 ± 4.24 units and Do P from 76.36 ± 33.90 to 72.66 ± 33.36 units. A significant reduction (*p* < 0.01) occurred in systolic pressure (SP) from 140 ± 3.26 to 137 ± 3.12 mmHg and pulse pressure from 58.5 ± 2.78 to 50 ± 2.39 mmHg. There was a statistically insignificant rise in mean arterial pressure (MAP) from 101 ± 1.97 to 103.67 ± 2.01 mmHg and diastolic pressure (DP) from 81.5 ± 1.76 to 87 ± 1.76 mm Hg.

Discussion and conclusion: *Chandra nadi pranayama* produced a significant decrease in HR and SP signifying a normalization of cardiovascular reflex mechanisms within 5 minutes. It also produced a significant fall in RPP and Do P signifying a reduction in oxygen consumption and work done by the heart. However, the rise in DP and MAP is difficult to explain. Further studies with more subjects and control groups are required to understand the possible mechanisms underlying this immediate effect of *chandra nadi pranayama* in hypertensive patients.

5. IMMEDIATE CARDIOVASCULAR EFFECTS OF SHAVASANA AND PRANAVA PRANAYAMA ON HEART RATE AND BLOOD PRESSURE OF HYPERTENSIVE PATIENTS

Introduction: The use of sound vibrations as part of relaxation in *shavasana* is taught in some yoga schools. The present study was planned to determine the cardiovascular effects of performing *shavasana* with *pranava pranayama* involving making akara, ukara, makara and omkara nada.

Methods: 19 hypertensive patients attending yoga therapy sessions at ACYTER were taught *shavasana* with *pranava pranayama* and instructed to perform the same for 15 minutes. Heart rate (HR) and blood pressure (BP) were measured with non-invasive semi-automatic BP monitor before and immediately after. Rate-pressure product (RPP) and double product (Do P) were derived by formulae.

Results: There was a highly significant (*p* < 0.001) reduction in systolic pressure from 135.94 ± 3.51 to 126.21 ± 2.88 mmHg, pulse pressure from 57.26 ± 3.02 to 50.15 ± 2.35 mmHg, RPP from 106.45 ± 5.36 to 97.35 ± 4.91 units and Do P from 121.41 ± 63.17 to 110.21 ± 56.35 units. Diastolic pressure reduced significantly (*p* < 0.01) from 78.68 ± 1.74 to 76.05 ±
1.59 mmHg. There was statistically insignificant reduction in HR from 78.05 ± 2.91 to 76.78 ± 2.89.

**Discussion and conclusion**: It is concluded that 15 minutes of *shavasana* with *pranava pranayama* can reduce BP in hypertensives. This may be due to a normalization of autonomic cardiovascular rhythms as a result of increased vagal modulation, and/or decreased sympathetic activity. It also produced a significant fall in RPP and Do P signifying a reduction in oxygen consumption and work done by the heart. Further studies are required to understand the possible mechanisms underlying this beneficial effect in hypertensive patients.

### 6. IMMEDIATE EFFECTS OF YOGA NIDRA ON HEART RATE AND BLOOD PRESSURE

**Introduction**: *Yoga nidra* is one of the special relaxation techniques of yoga. Previous studies have shown beneficial effects after different periods of training. The present study was undertaken to study the immediate cardiovascular effects of *yoga nidra* on 20 normal subjects.

**Methods**: 20 healthy volunteers attended 20 minutes of *yoga nidra* sessions during a one month period. They were instructed to mentally observe the body part by part in association with breath. Heart rate (HR) and blood pressure (BP) were measured before and after a single session. Pulse pressure (PP), mean arterial pressure (MAP), rate-pressure product (RPP) and double product (Do P) were calculated by formulae.

**Results**: Statistical analysis showed significant (p < 0.05) reduction in HR from 79.3 ± 2.45 to 75.2 ± 1.84 beats/min, RPP from 88.21 ± 3.33 to 81.89 ± 2.38 units and Do P from 66.84 ± 2.60 to 62.52 ± 1.89 units immediately after the *yoga nidra* session. There was insignificant reduction in SP from 111.2 ± 2.21 to 109 ± 2.05 mmHg, PP from 40.6 ± 1.42 to 38.9 ± 1.50 mmHg, DP from 70.6 ± 1.36 to 70 ± 1.25 mmHg and MAP from 84.08 ± 1.55 to 83.15 ± 1.40 mmHg.

**Discussion and conclusion**: It is concluded that 20 minutes of *yoga nidra* practice can reduce HR, RPP and Do P in normal subjects. This may be due to a normalization of autonomic cardiovascular rhythms as a result of increased vagal modulation, and/or decreased sympathetic activity. The reduction in RPP and Do P signifies reduction in oxygen consumption and work done by the heart. Further studies are required to understand possible mechanisms underlying this beneficial effect of *yoga nidra*. 