



भारतीय विमानपत्तन प्राधिकरण
AIRPORTS AUTHORITY OF INDIA

SKYFIT 

SKYFIT – HUMAN ENGINEERING & TRANSFORMATION TO UNLEASH THE FULL POTENTIAL OF SELF

**LIFE MANAGEMENT FOR ATCOs, PILOTS, CABIN CREWS,
AIR PASSENGERS THROUGH BREATHING TECHNIQUES**

**Modern Scientific Techniques infused
with Ancient Yogic Breathing Practices**

Holistic approach towards Quality Health & Well-being

Breathing exercise for Self-Healing : Forgotten science of talking to body and mind

A Long and Subtle Breath establishes a calm mind; A Calm mind is the foundation for everything great. But have you ever thought how to master the art of breathing for being the king of mind?

The unprecedented aviation growth, in the past few years, has posed various challenges for the aviation industry globally. One of the biggest challenge is the occupational stress for the personal working in the high demand environment.

The long term exposure to high stress is affecting the health of the personal severely, leading to conditions like hypertension, diabetes, Low energy level, Headaches, Upset stomach, aches, pains, tense muscles, Chest pain, rapid heartbeat, Insomnia, Frequent colds and infections etc.

Many studies have been conducted in the past regarding stress development process and interventions like Interventions on the external socio-economic environment, on technology & work organization, working place and task structure, improving individual responses & behaviour and by health protection and promotion etc.

Stress in the aviation industry is a common phenomenon composed of three sources, which are physiological stressors, psychological stressors, and environmental stressors.

Changes in work shifts and trans-meridian flight result in asynchrony between aviation personal's circadian rhythms. This lack of synchrony results in shift-lag syndrome (due to changes in work schedule) and jet-lag syndrome (due to trans-meridian flights) severely affects the body clock.

An airline pilot can be an extremely stressful job, due to the workload, responsibilities and safety of the thousands of passengers they transport around the world. Being a pilot is considered a unique job that requires managing high workloads and good psychological and physical health. Pilots are considered to be highly affected by stress levels.

The crewmembers even under ordinary conditions, face environmental stressors such as noise, vibration, decreased barometric pressure, and accelerative forces. Fatigue and altered sleep-wake cycles also may be factors, especially for crewmembers on flights that span several times zones.

Air Traffic Control is a highly demanding job with high stress levels due to the complexity involved balancing the controlling numerous aircraft in an efficiently, expeditiously and safe manner whilst also catering for contingencies such as weather development and aircraft emergencies etc. Due to this complexity, controllers require high cognitive capacities which include spatial scanning, movement detection, image and pattern recognition, prioritizing, visual and verbal filtering, coding and decoding, inductive and deductive reasoning, short- and long-term memory, and mathematical and probabilistic reasoning.

BREATHE for Better Health

The Yogis of the ancient traditions have closely studied the association of breath and the mind. All of the body systems are either INVOLUNTARY or VOLUNTARY ones. Breathing is the only system that can be made voluntary at any time. And this is the key to controlling the nervous system on which our breathing exercises are based.



When you own your breath nobody can steal your peace

Elixir for Healthy Life in Aviation: SkyFit

Airports Authority of India has worked closely with the experts of the Yogic Tradition and medical experts, to develop simple breathing exercises that can help in managing all kinds of stress. The session SKYFIT organised by AAI along with yoga and breath works experts, can help the personnel involved in aviation industry at various levels, in learning these simple yet effective breathing techniques, to manage stress in a remarkably efficient manner.

Yoga brings harmony in all walks of life and thus, is known for disease prevention, health promotion and management of many lifestyle-related disorders.

It embodies unity of body, breath and mind; thought and action; balancing restraint and fulfilment; harmony between man and nature and a holistic approach to health & well-being. 'Right Breathing' is the most effective and by far, the most enjoyable tools to unwind and relax internally and externally.

Benefits of SkyFit:

- Control Breath to control mind
- Enhance Cognitive thinking, emotions, analytical and learning powers,
- Increased awareness, sensitivity and controlled responses
- Channelize thought processes of the mind
- Influence our Nervous System, the treasure house of all human potential and possibility
- Reduces and manage stress
- Takes care of psychosomatic and lifestyle diseases like hypertension, diabetes, pulmonary disorders and mental illnesses.
- Benefits irrespective of age, gender or physical fitness level.
- Improve the way we breathe



Empower and Enlighten Yourself

You can't go back and change the beginning,
but you can start where you are and change
for the better

Live Life to the fullest



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SKYF^oT



**Modern Scientific Techniques infused with Ancient Yogic Breathing
Practices for Pilots, ATCOs, Cabin Crews, Air Passengers**



DISCLAIMER

1. This book is not intended as a substitute for any professional or medical advice. The reader should regularly consult a physician or a certified expert in matters relating to his/her health, and particularly with respect to any symptoms that may require diagnosis or medical attention or professional guidance.

2. The information in this book is for reference purposes only, and not in any manner meant to replace, proper professional training. Like any physical activity involving speed, equipment, balance and environmental factors, the techniques disclosed herein may pose some inherent risk. The authors and publisher advise readers to take full responsibility for their safety and know their limits. Before practicing the techniques described in this book, be sure that your body is medically fit and do not take risks beyond your level of experience, aptitude, training, and comfort level.

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FOREWORD

हरदीप एस पुरी
HARDEEP S PURI



सत्यमेव जयते



आवासन और शहरी कार्य राज्य मंत्री (स्वतंत्र प्रभार)
नागर विमानन राज्य मंत्री (स्वतंत्र प्रभार)
वाणिज्य एवं उद्योग राज्य मंत्री
भारत सरकार
Minister of State (IC), Housing & Urban Affairs
Minister of State (IC), Civil Aviation
Minister of State, Commerce & Industry
Government of India

MESSAGE



It gives me immense pleasure to know that Airports Authority of India (AAI) is launching an E-Book on "SkyFit – a new way of life" on 26 September 2019, during the 40th Session of ICAO General Assembly at Montreal.

Stress is a common phenomenon in the aviation industry particularly for airline pilots, cabin crew and air traffic controllers due to the complexity involved in their duties.

SkyFit is a programme giving details about simple breathing techniques to manage stress of the aviators. The programme has been developed by the experts in yogic traditions and medical science. United Nations General Assembly has declared 21 June as International Yoga Day thereby recognizing the age old practice as a holistic approach to health and well-being.

I congratulate the entire AAI team for this innovative venture and at the same time encourage the global aviation fraternity to practice SkyFit, for a stress-free and healthy life.

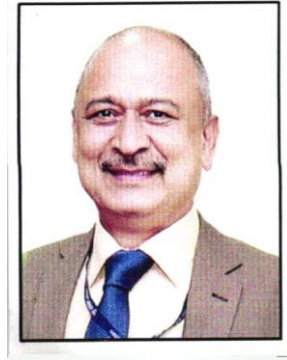

(Hardeep S Puri)

प्रदीप सिंह खरोला
Pradeep Singh Kharola



सचिव
भारत सरकार
नागर विमानन मंत्रालय
नई दिल्ली-110 003
SECRETARY
GOVERNMENT OF INDIA
MINISTRY OF CIVIL AVIATION
NEW DELHI-110 003

12.09.2019



FOREWORD

I am glad to know that Airports Authority of India is launching E-book on SkyFit – a new way of life which comprises innovative techniques for enhancing the quality of life, touching every sphere of aviation.

SkyFit, as the name suggests, relates to fitness and well-being of the people associated with Aviation. India, along with many other countries, is rejoicing the double digit growth in aviation for the past few years. We must not forget the human resource who are working tirelessly to sustain this growth in very sphere of aviation industry.

Yoga is associated with the culture and heritage of India. In Sanskrit, yoga means ‘to unite’ and describes a way to live a healthy life. I am sure SkyFit E-book would help enhance the health & well-being of the aviation personnel, globally.


(Pradeep Singh Kharola)



Director General
Airports Council International

Foreword / Testimony

The Airports Authority of India will be launching SkyFit – E Book during the 75th Anniversary of ICAO to be held on 26th September 2019.

The development of SkyFit by Airports Authority of India reflects the increasing importance of providing wellbeing in the workplace for staff, especially in the fast moving and diverse environment of aviation.

Having been given a demonstration of SkyFit earlier this year during the Global Summit in Mumbai, I hope that it proves to be a beneficial contribution to the global effort of promoting wellbeing in the workplace.

I wish all the best of luck to Airports Authority of India and the global aviation fraternity in this important area.

अश्वनी लोहानी
अध्यक्ष एवं प्रबंध निदेशक
Ashwani Lohani
Chairman & Managing Director



Foreword



It is indeed a matter of pride that Airports Authority of India has come up with E-Book on SkyFit – a new way of life, which is being unveiled during the 75th anniversary Celebration of ICAO on signing agreement on Geneva Convention. SkyFit uses simple breathing techniques and lifestyle changes, addressing the occupational stress of cabin crews, air passengers, pilots and people working in aviation sector.

SkyFit is a unique concept aimed at reducing the stress level and leading a healthy life. The book explains simple techniques that are useful for the same.

I am pleased to note that Airports Authority of India is continuing its efforts in working for the benefit of all, in the true spirit of 'Vasudeva Kutumbakam' ie 'The entire world is one family.'

My best wishes to the global aviation fraternity on this happy occasion.


(Ashwani Lohani) 12/9/2019
Chairman

ARUN KUMAR, IAS

**DIRECTOR GENERAL OF CIVIL AVIATION
TECHNICAL CENTRE
OPPOSITE SAFDARJUNG AIRPORT
New Delhi - 110003**



अरुण कुमार, भा.प्र.से.

**महानिदेशक नागर विमानन
तकनीकी केन्द्र
सफदरजंग हवाई अड्डे के सामने
नई दिल्ली-110 003**

Foreword/Testimonial



I am very happy to know that Airports Authority of India is releasing an E-book on SkyFit- for Simple Way of life during the 40th Assembly Session of ICAO.

Aviation is a serious business and like all other serious businesses, it also has its share of stress and to bust it, we need to go to Airports Authority of India and adopt their SkyFit. Do some simple breathing exercises to improve the way, we breathe and manage your stress better. In fact, the practices are based on Ancient Indian Yogic Traditions and are promising. Shall appeal to all to give it a try and discover.

On this great occasion, I wish Airports Authority of India Godspeed.

Arun Kumar
(Arun Kumar)
16.09.2019

उषा पाढी, भा.प्र.से.
Usha Padhee, IAS



संयुक्त सचिव
नागर विमानन् मंत्रालय
भारत सरकार
JOINT SECRETARY
MINISTRY OF CIVIL AVIATION
GOVERNMENT OF INDIA

Foreword / Testimony



With immense pleasure I congratulate the entire team of Airports Authority of India to launch SkyFit – E Book during the occasion of 75th Anniversary of ICAO to be held on 26th September 2019.

Yoga belongs to the world. But it has a home in India. I am glad, Airports Authority of India has devised SkyFit – simple breathing techniques for Pilots, Air Traffic Controllers, Cabin Crews, Air Passengers, Ground Handlers etc ie touching every lives in aviation.

When I started Yoga classes in my initial years, little did I know it would change my life. I soon found the benefits of Yoga to be enormous, on every level.

I wish all the best of luck to the global aviation fraternity to include SkyFit in their professional lives and reap its benefits.



(Usha Padhee)

Joint Secretary (MoCA)

Chairman & Managing Director (Pawan Hans Ltd)



I would like to congratulate Airports Authority of India for the launch of E-Book on SkyFit – a new way of life.

Work related Stress has posed a severe challenge for the aviation safety and managing it in the right way is the only mitigation. I am happy to note that combining the ancient yogic exercises and modern day medical techniques, can bring out something as unique as SkyFit. I hope that Airports Authority of India will continue its efforts, in working consistently for the benefit of the global aviation industry.

Vanpheng Chanthaphone
Director General
DCA, Lao PDR

I am happy to hear that Airports Authority of India is launching E- Book on SkyFit at Montreal during the 75th Anniversary Celebration of ICAO on signing of Geneva Convention.

Absence of stress busters severely affects the body clock. Airports and airlines are facing growth trajectory and coping with stress is a huge challenge. It is good to know that SkyFit devised by Airports Authority of India addresses those challenges of Cabin Crews, Pilots, Air Passengers and Aviation in general.

I wish all success to the Airports Authority of India.

Sincerely yours,



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MESSAGE



It gives me immense pleasure and a sense of pride that AAI is launching E Book on **SKYFIT** addressing ways to handle occupational stress related with the aviation professionals and help airline staff and ground personnel deal with work-related stress.

Stress at work is unavoidable, but it is definitely fixable. In the airline industry, occupational stress is a common problem due to high work demand, odd working hours and jet lag. While stress may come in any form, the answer to this problem is one – right breathing coupled with some exercises. Breathing is a powerful tool in our hands.

The SkyFit program has been developed in coordination with experts in yogic tradition and medical science. This program has been developed envisaging Shri. Narendra Modi, Hon'ble Prime Minister of India's Vision of Yoga as a globally uniting force. It is with this vision that United Nations General Assembly has declared 21st June as International Day of Yoga.

Airports Authority of India has always propagated ICAO theme of 'No Country Left Behind' and with the introduction of SKYFIT e-book, Airports Authority of India intends to support aviation professionals and air travellers all across the world to cope with stress and other health hazards.

I would like to commend efforts of Business Development Team of Airports Authority of India, specially Mr. Chandra Shekhar Tewari, IAP for conceptualizing SkyFit alongwith Mr. Sandeep

Kathuria, IAP who has compiled and coordinated with yogic and medical consultants for bringing this unique program for Global Aviation Fraternity.

The powerful message of SKYFIT is secrets of Success includes both physical fitness and mental poise.

I hope that the SKYFIT guide will help the aviation fraternity particularly pilots, crew members, air traffic controllers and passengers to enhance the quality of life and enjoy safe and quality air travel.



(Anuj Aggarwal)
Chairman
Airports Authority of India

PREFACE

To conquer stress, you must first conquer your breath.

The aviation industry has seen remarkable progress globally in the last few years. Inevitably, along with progress, come an array of challenges. One such unclaimed luggage is “stress”.

Stress in moderation is good. It pushes the individual towards personal growth. It is a little stress on the rubber band that allows it to expand beyond its boundaries. Similarly, employees are likely to step up to the challenge and perform better. However, if gone unchecked, stress can take a toll on the physical and emotional health of the employees and cause them to snap.

In fast-paced, high-demand environments, such as the aviation industry, occupational stress is not uncommon. Physiological, psychological and environmental factors are three main stressors affecting an individual. Some of these are unavoidable due to the nature of the job. For example, aviation crew and even frequent fliers often experience shift-lag syndrome (due to changes in work schedule) and jet-lag syndrome (due to trans-meridian flights), thereby causing asynchrony in the circadian rhythm.

If the body clock falls out of sync, serious medical complications can arise. These include hyper-tension, diabetes, low energy level, headaches, upset stomach, aches, pains, tense muscles, chest pain, rapid heartbeat, insomnia, frequent colds and infections, and many more.

Keeping in mind the health and safety of our airline crew and passengers, Airports Authority of India has developed ‘SKYFIT’ – a program that couples the qualities of simple breathing techniques and stretching exercises to help manage stress.

Practicing the SKYFIT techniques regularly can help the fliers, the staff in particular, not just cope with stress and other health hazards, but also increase alertness and efficiency making air travel the safest mode of travel.

SKYFIT was conceptualized by Mr. Chandra Shekhar Tewari, IAP, DGM (Business Development), AAI with inputs from Mr. Sandeep Kathuria, IAP, DGM (Business Development) AAI, and other members of the team. The techniques and practices have been incorporated under the supervision of senior medical consultant and breath work expert, Dr. Ashok Bhatt.

In the last one year, AAI has organized several successful SKYFIT programs both in India and abroad. The pilot was conducted for air traffic controllers working at busy air traffic control centres in Delhi and Chennai. Another program was organized during the Global Aviation Summit in Mumbai, India, in January, 2019, and was attended by civil aviation experts from more than 88 countries. During this summit, the SKYFIT Mobile Application was also launched, which is now available on Google and Apple play store. At the internal level, a similar event was conducted in Vientiane, Laos PDR, during the International Yoga Day Celebration in 2019. The program was attended by more than 1200 persons from different countries. The concept has been well appreciated for its simplicity, ease of practice and associated benefits.

We hope that the SKYFIT guide will help the aviation fraternity particularly pilots, crew members, air traffic controllers and passengers to enhance the quality of life and enjoy safe and quality air travel.

SKYFIT MOBILE APPLICATION



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WORKING PAPER AT ICAO



International Civil Aviation Organization

WORKING PAPER

AN-Conf/13-WP/234
28/9/18
(Information Paper)
English only

THIRTEENTH AIR NAVIGATION CONFERENCE

Montréal, Canada, 9 to 19 October 2018

Agenda Item 8: Emerging safety issues
8.1: Measures to proactively address emerging issues

SKYFIT - STRESS MANAGEMENT THROUGH BREATHING TECHNIQUES: YOGIC BREATHING TO MANAGE STRESS

(Presented by India)

EXECUTIVE SUMMARY

This paper intends to address the occupational stress of the personnel in aviation, be it air traffic controllers, pilots, cabin crew etc. The unprecedented growth in aviation has posed severe threat to the safety of aviation, in terms of the pressure created by capacity vs demand, on the existing infrastructure and resources. The worst hit of all is the human resource. The occupational stress due to cognitive work load of the personnel, especially in aviation can be a challenge for the safe aviation. Long term exposure to the stress is posing severe health issues like hypertension, ischaemic heart disease, diabetes, peptic ulcers and psychoneurotic disorders for the people employed in aviation. Various measures have been discussed in past like improving job planning and reliability of the work systems, improving the work environment, reduction of working hours etc. Airports Authority of India (AAI) has developed simple breathing exercises, in coordination with experts who have practiced these ancient techniques from yogic traditions, for decades and have found encouraging results in managing the stress of the aviation personnel, by just improving the way we breath.

AAI would like to share these unique and effective techniques, through its programme SKYFIT, with the aviation world, to cope up with the challenges of managing stress of pilots, cabin crew, air traffic controllers and above all air passengers.

1. INTRODUCTION

1.1 The unprecedented aviation growth, in the past few years, has posed various challenges for the aviation industry globally. One of the biggest challenge is the occupational stress for the personnel working in the high demand environment.

1.2 The long term exposure to high stress is affecting the health of the personnel severely, leading to conditions like hyper-tension, diabetes, low energy level, headaches, upset stomach, aches, pains, tense muscles, chest pain, rapid heartbeat, insomnia, frequent colds and infections etc.

1.3 Many studies have been conducted in the past regarding stress development process and interventions like Interventions on the external socio-economic environment, on technology and work organization, working place and task structure, improving individual responses and behaviour, and by health protection and promotion etc.

1.4 Stress in the aviation industry is a common phenomenon composed of three sources, which are physiological stressors, psychological stressors and environmental stressors.

1.5 Many human biological and behavioural functions vary regularly and systematically over a period of about 24 hours. These variations are called circadian rhythms, which are internally generated by a self-sustaining or autonomous biological clock located in the hypothalamus.

1.6 Changes in work shifts and trans-meridian flight result in asynchrony between aviation personnel's circadian rhythms. This lack of synchrony results in shift-lag syndrome (due to changes in work schedule) and jet-lag syndrome (due to trans-meridian flights) severely affects the body clock.

1.7 An airline pilot can be an extremely stressful job, due to the workload, responsibilities and safety of the thousands of passengers they transport around the world. Being a pilot is considered a unique job that requires managing high workloads and good psychological and physical health. Pilots are considered to be highly affected by stress levels.

1.8 The crewmembers, even under ordinary conditions, face environmental stressors such as noise, vibration, decreased barometric pressure, and accelerative forces. Fatigue and altered sleep-wake cycles also may be factors, especially for crewmembers on flights that span several times zones.

1.9 Air traffic control is a highly demanding job with high stress levels due to the complexity involved balancing the controlling numerous aircraft in an efficiently, expeditiously and safe manner whilst also catering for contingencies such as weather development and aircraft emergencies etc. Due to this complexity, controllers require high cognitive capacities which include spatial scanning, movement detection, image and pattern recognition, prioritizing, visual and verbal filtering, coding and decoding, inductive and deductive reasoning, short- and long-term memory, and mathematical and probabilistic reasoning.

1.10 At increasingly high levels of stress, degradation of performance occurs because with higher arousal, we tend to focus solely on the main task, ignoring other peripheral information, contributing to errors.

1.11 Practices combine physical poses, controlled breathing, and meditation, in fact, it encompasses all –body, breath, mind and spirit. The techniques may help reduce stress and thus taking care of psychosomatic and lifestyle diseases like hypertension, diabetes, pulmonary disorders and mental illnesses. Everyone can be benefited by these exercises irrespective of age, gender or physical fitness level.

1.12 Stress and tension can cause us to breathe in a rapid, shallow way, which can lead to more anxiety. The techniques to breathe more effectively, using the diaphragm and utilising the whole lung capacity also called the “pranayama techniques”, which includes a lot of scientifically backed breathing exercises, are useful for reducing stress.

2. DISCUSSION

2.1 The yogis of the ancient traditions have closely studied the association of breath and the mind. All of the body systems are either INVOLUNTARY or VOLUNTARY ones. Breathing is the only system that can be made voluntary at any time. And this is the key to controlling the nervous system on which our breathing exercises are based. One of the main aims of breathing exercises /practices is to gain control over the nervous system, which in turn enables one to control mind and its associated functions like thinking, emotions, analytical and learning powers, which leads to increased awareness, sensitivity and controlled responses. For every emotion there is a different breathing pattern. By consciously controlling the breath and simulating the breathing pattern one can change the thought processes of the mind, as and when required. This is significant as we can influence our nervous system, the treasure house of all human potential and possibility.

2.2 The expert team behind SkyFit have followed the renowned and scientific techniques of “pranayama” and discovered the phenomenal benefits that accrue by varying the rate and duration of breathing and holding the breath at different points. This is done consciously to effectively intervene in the predominantly autonomic breathing to get holistic development of the body, mind and spirit. By taking charge of our breath we can take charge of our nervous system especially autonomic nervous system and thus markedly reduce the stress levels. This in turn leads to controlling the psychosomatic disorders including STRESS.

2.3 AAI has worked closely with the experts of the yogic tradition and medical experts, to develop simple breathing exercises that can help in managing all kinds of stress. The session SKYFIT organised by AAI along with yoga and breath works experts, can help the personnel involved in aviation industry at various levels, in learning these simple yet effective breathing techniques, to manage stress in a remarkably efficient manner.

2.4 On 11 December 2014, 177 Countries in the United Nations General Assembly recognised that yoga provides a holistic approach to health and well-being and wider dissemination of information about the benefits of practicing yoga for the health of the world population. Yoga also brings harmony in all walks of life and thus, is known for disease prevention, health promotion and management of many lifestyle-related disorders.

3. CONCLUSION

3.1 SKYFIT is the outcome of coming together of experts from yogic traditions and medical science to evolve simple technique especially designed for aviation personnel i.e. pilots, cabin crew, air traffic controllers and air passengers. It embodies unity of body, breath and mind; thought and action; balancing restraint and fulfilment; harmony between man and nature and a holistic approach to health and well-being. “Right breathing” is the most effective and by far, the most enjoyable tools to unwind and relax internally and externally. Stress is not something we can completely shelter from, but through these simple techniques, which includes correct way of breathing (diaphragmatic breathing), breath awareness and consciously controlled breathing exercises, we can learn how to reduce the impact of stressful situations and set ourselves up for a much happier, healthier and positively controlled future. AAI can help you learn these simple techniques through its programme SKYFIT.

— END —

ENHANCE YOUR WAY OF LIVING



**SKYFIT – HUMAN ENGINEERING & TRANSFORMATION
TO UNLEASH THE FULL POTENTIAL OF SELF**

**LIFE MANAGEMENT FOR ATCOs, PILOTS, CABIN CREWS,
AIR PASSENGERS THROUGH BREATHING TECHNIQUES**

Modern Scientific Techniques infused with
Ancient Yogic Breathing Practices

Holistic approach towards Quality Health & Well-being

SKYFIT

CHAPTER 1 SKYFIT: The New Way of Life

Focusing on the act of breathing clears the mind.

Greatness isn't born; its made

The aviation industry globally has experienced remarkable growth in the past few years.

Along with the progress come a multitude of challenges, one of the biggest being occupational stress for the people working in such a fast-growing and high-demand environment.



The job of **airline pilot** demands good psychological and physical health and is considered unique due to the high workload and responsibilities, especially the responsibility of flying thousands of passengers across the world. Owing to the nature of their job, a pilot is easily affected by stress.



The **crew members** are exposed to different environment stressors such as noise, vibration, decreased barometric pressure and accelerative forces. In addition, fatigue and altered sleep-wake cycles also may be stress-causing factors, especially for crew members on flights that span several time zones.



Another highly stressful and demanding job is that of an **air traffic controller**. The controller carries the onus of ensuring safe landing of the aircrafts. The job is therefore highly complex requiring exceptional levels of alertness and response skills to make sure efficient and safe navigation whilst also responding to emergency situations such as weather changes and aircraft emergencies. Controllers require high perceptive capacities which include spatial

scanning, movement detection, image and pattern recognition, prioritizing, visual and verbal filtering, coding and decoding, inductive and deductive reasoning, short- and long-term memory, and mathematical and probabilistic reasoning.



Air passengers: Humans are land organisms that are comfortable living close to the sea level. Any change in their natural habitat can have adverse effects on their health. Frequent flying is a kind of change that can bring about sudden change in atmospheric pressures, gas concentration, altitude and temperature. The problem is magnified in case of long-haul passengers whose body clock is disrupted due to repeated and multiple changes in the time zones called jet lag. Jet lag can result in numerous issues including sleep disorders, stomach disorders, loss of appetite, fatigue, irritability, anxiety, irregular menstruation and memory problems.

Passengers also face dehydration: this happens primarily due to the fact that aircraft cabins have a relative humidity which is less than 20 percent of what the body requires to avoid dehydration. While this is vital in order to keep the aircraft free from issues that result due to condensation, the human body can be severely impacted due to dehydration.

These days, almost every working individual is exposed to numerous factors that aggravate stress levels and lead to conditions such as hyper-tension, diabetes, low energy level, headaches, upset stomach, aches, pains, tense muscles, chest pain, rapid heartbeat, insomnia, frequent colds and infections. Stress is part of the package and cannot be completely eliminated, but it can definitely be managed if we learn the right techniques and best practices.

The nervous system comprising the brain, spinal cord and the network of nerves is the most important system in the human body. It is this system that equips us humans to push our boundaries and do the undoable.

The ancient yogis, over the years, have tried understanding the human body and its key processes. They made a key observation that some of the important bodily functions such as blood circulation and digestion of food are autonomous and beyond our control. But, breathing is the only function that can be controlled by us.

Interestingly, they also found that most people were unaware about the correct way of breathing: they performed what is known as “chest breathing” and failed to use their capabilities to the fullest potential. On the contrary, the yogis ensured that they applied the correct breathing practices called the “diaphragmatic breathing” which involves slow, deep breathing. This unlocks the higher respiratory centre in the human brain, thereby getting a control over their breathing.

Through correct breathing, we have greater control over our thoughts and emotions, and hence, have a higher degree of calmness. This gives a sense of peace to the body and mind and we feel more relaxed. Oxygenation at the cellular level that one experiences leads to all round health of the body, mind and spirit. Once we master the art of breathing, we need to incorporate it into our day-to-day lives and let it happen subconsciously.

The yogis practiced what we call the “Pranayama” – a technique with which we can alter the rate and duration of breathing and hold our breath at different points. The benefits of pranayama are numerous. By practicing pranayama, one can successfully intervene in the

process of breathing and reap benefits in the form of holistic development of the body, mind and spirit.

Airports Authority of India in consultation with Dr. Ashok Bhatt, a renowned medico, who has mastered the technique for over two decades, has developed a unique system of breathing and simple yogic practices to manage aviation-related stress.

“SKYFIT - the new way of life” is aimed at stress management through breathing techniques. It is designed to ease out the challenges faced by the aviation professionals - be it the aircraft pilots and cabin crew, or air traffic controllers. It helps in taking care of the fear of flying in the minds of air passengers. It is said that breath is the barometer of the nervous system. All the organs in the body are controlled by the nervous system. So just by taking care of our breath, we can take care of the functioning of various organs. As we are aware that breath can directly take control of both parts of the autonomic nervous system-parasympathetic nervous system (relaxation and digestion system) and sympathetic nervous system (fight and flight system), which in turn helps in de-stressing the body and mind, both.

SKYFIT as a module consists of two components – a set of exercises, which can be done within a confined space, and breathing exercises. These exercises are aimed at activating the prana (life energy) all over the body and contribute in the smooth flow of life energy all over the body. These exercises have been devised depending upon the space available. For example, the **pilots, cabin crew** and **air traffic controllers** work at different, confined locations. The **ground staff**, however, has more space to work out.

The second part of the SKYFIT module concentrates on the breath - which directly affects both the body and the mind - and forms the core of the **SKYFIT** module.

Breathing exercises consist of three components and the most important one is learning the art of correct breathing. The other component is the art of breath awareness and third and the final one is conscious breathing that is playing with our breath according to the situations we are in. This not only helps us in responding to those situations in a proper way but also taking care of health healing and rejuvenation.

Importance and benefits of Yoga

The importance of Yoga was widely acknowledged on 11 December 2014, at the United Nations General Assembly when 177 countries recognized that Yoga provides a holistic approach to overall health and well-being, brings harmony in all walks of life and is specially known for disease prevention, health promotion and management of many lifestyle-related disorders. Conscious breathing allows us to shift and release negative energy during stressful moments. Breath can increase alertness and oxygen flow and allow the body to release toxins more readily. As we know, all the systems of our human body are either voluntary or involuntary. But, breathing is the only system, which though involuntary, can be made voluntary, by practice. This breath can be used as a master key to take charge of our overall health. Stress is not something we can completely shelter from, but through “right breathing” (diaphragmatic breathing), breath awareness and consciously controlled breathing exercises, we can learn to reduce the impact of stressful situations.

CHAPTER 2: What is Stress? Aviation & Stress

It's not the load that breaks you, but the way you carry it

Reduce Stress and Boost Concentration with simple breathing exercises

According to Dr. Hans Selye, stress is defined as "any event which may make demands upon the organism, and set in motion a non-specific bodily response which leads to a variety of temporary or permanent physiological or structural changes". Richard S Lazarus simplified the above definition (commonly accepted definition) and stated that "stress is a condition or feeling experienced when a person perceives that demands exceed the personal and social resources the individual is able to deliver." (1)

In aviation, incidents usually occur in a sequence of mistakes made, like a domino effect. Stress is the trigger that many a times pushes the first domino into the rest causing the effect. In order to maintain safety in aviation, at least one of these dominos must be removed to avoid a dreadful accident. In these type of scenarios Human factor studies and hard work plays a very important role. Depending on what type of job a person is performing in aviation, they must take steps to minimize the stress. Stress can be avoided by taking into account possible factors of stress. To avoid body fatigue and stress few of physical factor that should be taken care are getting proper rest, eating healthy and balance diet, drinking plenty of water and exercising regularly. Mental factors are equally important. Knowing one's job well and being confident in the execution of his/her duties will reduce the work stress. The balance between physical and mental factors does not completely eradicate the stress factor, but it will help to minimize the stress to manageable and thus safer for everyone.

Major effects of stress on the body and its symptoms

To put it simply, the "victim" of stress will experience the following main symptoms.

Physical symptoms

- Tense muscles, especially in the neck and shoulders
- Headache or backache
- Stomachache, nausea, vomiting, diarrhea or constipation
- Tiredness or difficulty sleeping
- Unusually rapid heartbeat
- Shakiness or excessive sweating
- Weight loss or weight gain
- Clenched jaw or clenched teeth
- Fingernail-biting
- Sighing or changes in breathing patterns

Emotional symptoms

- Frustration, irritability or anger
- Depression or anxiety;
- Nervousness
- Boredom or apathy

Behavioural symptoms

- Abuse of alcohol, drugs or other substances
- Marital problems
- Binge eating
- Self-destructive behavior

Mental symptoms

- Forgetfulness, preoccupation and difficulty concentrating
- Indecisiveness
- Work mistakes and loss of productivity

- Excessive worry
- Decrease in creativity
- Loss of sense of humor

Different Types of Stress

Contrary to the popular belief that all stress is negative, stress can either be good (Eustress) or bad (Distress).

Eustress or good stress can result in better performances. Good Stress gives the incentive for aviation personnel to achieve the assigned task, to train tougher, to enhance their standards of performance to become the best in their job.

While distress on the other hand, affects people by bogging them down, causing them to lose focus, doing time critical tasks in their area of work leading to accidents.

These are manifested in the following manner:

- Poor decision making
- Loss of situational awareness
- Make errors of judgement
- Become confused
- Unable to cope with increase in workload
- General adaptation syndrome

Generally, it indicates the three steps of progression of stress- alarm (symptoms), resistance (reactions) and exhaustion (breakdown)

Symptoms

Common ones are irritability, agitation, poor analytical skills and judgement, mood changes, nervous habits, tendency to take fast decisions without much application of intelligence;

Physical Symptoms

Aches and pain, nausea, bowel disturbances, indigestion, loss of appetite, dizziness chest pain, sleep disturbances, sexual problems etc.

Stressed people try to counter these symptoms by excessive drinking, smoking, taking anxiolytic or tranquilizers etc. Though temporary relief is there but in the long term, it aggravates the symptoms and make the things worse.

Any stress which happens releases the stress hormones-which are adrenaline, noradrenaline and cortisol

Adrenaline increases the heart rate, heart beats strongly, diverts blood to the muscles, vasoconstriction in the skin becomes profound and increases the sweating.

Nor adrenaline shifts the blood into the muscles, causes tachycardia (increased hrs), releases the glucose in the blood streams

Cortisol raises blood pressure, raises blood sugar, acid secretion in the stomach increases, causes water retention in the body, decreases the immunity, fat deposition around the waist and craving for high sugar and high fat products.

Further as the stress starts taking roots the blood flow in the muscles increases to prepare for the fight and flight system and as a result, the muscle fatigue and body aches set in.

If these stress hormones are secreted for a long time, one is likely to develop high Blood Pressure, Diabetes Mellitus, decreased immunity and increased risk of heart attack.

Later on, the over breathing occurs which leads to the washing of Carbon Dioxide (CO₂) levels and one starts feeling unwell.

So overall, the body symptoms commonly encountered are headaches, feeling dizzy, dry mouth, chest pain, palpitation, breathlessness, trembling, butterflies in the stomach, rumbling tummy, Bloating, bowel disturbances etc.,

Also before we learn the ways of de-stressing ourselves, we need to understand the medical science behind this and for this we have to understand what and how of the nervous system. It behaves in a way that it causes stress to the body and to the mind.

The nervous system is divided into two parts – sensory division and the motor division. Sensory division helps in interacting with the external world and the motor activity is for controlling all external and internal activities of the body. Motor activity is of two types - voluntary and involuntary. All the involuntary activities are controlled by autonomic nervous system. So in effect, all our organs and internal activities are regulated by the ANS (Autonomic Nervous System) which has two branches –Parasympathetic Nervous System (PNS) (also called relaxing and digesting system) and Sympathetic Nervous Systems (SNS) (fight and flight) the PNS causes relaxation and SNS causes stress. All the internal activities and organs are innervated by both the branches. By taking care of the breath and learning the art of breath awareness, we can control this important aspect of our nervous system. This is the reason why yoga says “breath is the real indicator of the state of the nervous system”. During stress the SNS becomes predominant and by making our PNS predominant, we can learn the art of de-stressing ourselves. So, taking care of stress effectively means making the parasympathetic nervous (PNS) system predominant

Reasons of stress in Aviation

- Operational Traffic loads
- Limited time to respond
- Quick Real time decisions
- Operational procedures (often limited and need to be adapted)
- Limitations of the machines /instruments in use
- Emergencies like machine/ engine malfunctioning, medical emergencies, hijacking etc.
- Fear of unknown
- Limited space to operate
- Loud noise
- Long flying hours

- Memory requirements
- Communication skills and maintaining a high level of arousal even in non-peak conditions
- Stress leading to loss of overall picture
- Remarkable cognitive and sensory attributes required for high performance at the radar stations
- Organisational
- Shift schedules (night work in particular)
- Management
- Role conflicts
- Unfavourable working conditions
- Long working hours

The Stress Response

The groundwork for the modern meaning of “stress” was laid by Dr. Walter B. Cannon, a physiologist at Harvard almost 100 years ago. He was the first to describe the “fight or flight response” as a series of involuntary physiological and biochemical changes that prepare us to deal with threats or danger ⁽²⁾. This response was critical to the survival of primitive humankind when requiring quick bursts of energy to fight or flee predators such as the tiger. Hans Selye, the first major researcher on stress, was able to trace what happens in the body during the fight or flight response. He found that any problem, which is real or imagined, could cause the cerebral cortex (the thinking part of the brain) to send an alert to the hypothalamus (the main switch for the stress response it is located in the midbrain). The hypothalamus then stimulates the sympathetic nervous system to make a series of reactions in the body. As a result, the heart rate, breathing rate, muscle tension, metabolism, and blood pressure all increase. Our hands and feet get cold as blood is directed away from extremities and digestive

system into the larger muscles that can help us fight or run. We experience butterflies in our stomach, our diaphragm locks. The pupils dilate to sharpen our vision and our hearing becomes more acute. While all of this is going on, something else needs to be checked in time or else it can have long-term negative effects. Our adrenal glands start to secrete corticoids (adrenaline, epinephrine, and norepinephrine), which inhibit digestion, reproduction, growth and tissue repair and the responses of our immunity and inflammatory systems. In other words, some very important functions that keep our body healthy begin to shut down. During emergency stress response can be useful but in our modern life style frequent or unrelenting triggering of stress response without balancing relaxation response contributes to number of diseases and symptoms. By stress response can be turned off by using same mechanism. This is known as Relaxation response. As soon as we decide that a situation is no longer dangerous, our brain stops sending emergency signals to our brain stem, which in turn ceases to send panic messages to our nervous system. Minutes after the danger signals stop, the flight or fight response stops. The metabolism, heart rate, breathing rate, muscle tension, and blood pressure all return to their normal levels. Many professionals suggest that we can use our breath to change our physiology for the better and improve our health by using the natural restorative process called the Relaxation Response.

The Relaxation Response

Researchers have found that there is a counterbalancing mechanism to the stress response. Stress response can be caused by stimulating an area of the hypothalamus while its reduction can be achieved by activating other areas of the brain. This opposite state is the “relaxation response”. The relaxation response can be defined as a physical state of deep rest that alters the physical and emotional responses to stress. When evoking the relaxation response: our metabolism decreases the heart beats slower and our muscles relax, our breathing becomes

slower, the blood pressure decreases and we return to a calmer state of being. If practiced regularly, it can have lasting effects.

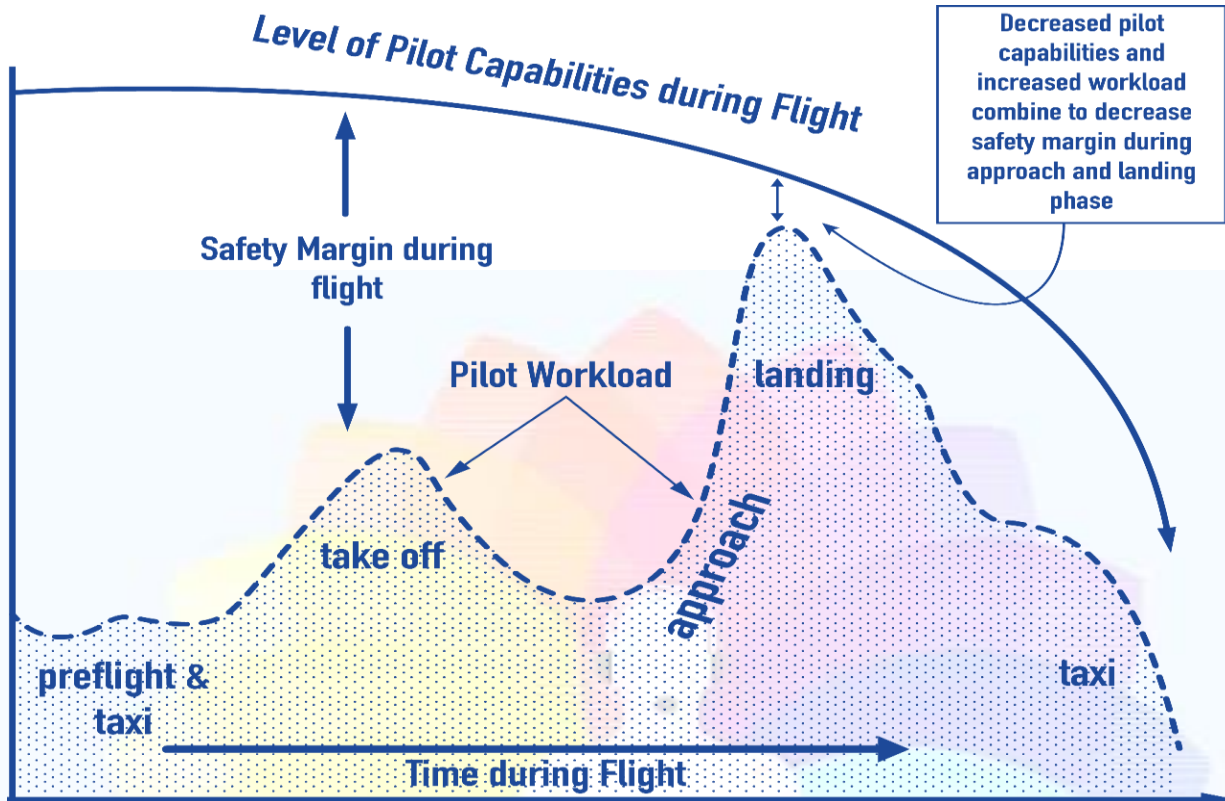
Link between stress and performance

Eustress or the good stress brings out the best of performance in an individual, but if the increasing stress is left unchecked, distress will occur, leading to a breakdown of performance. During low levels of arousal stress body's alertness mechanisms becomes sluggish. With increase in stress level body reacts optimally according to task complexity, body is more and more attuned to the environment. However, with increasingly high stress level, higher arousal results into performance degradation. Focus remains solely on one task and ignores surrounding information which leads to errors.

Pilot Stress

In aviation, at all phases of flight, pilots are subjected to different amounts of stress; how they react when subjected to stress will ultimately make or break whether the outcome is a safe and successful flight.

The image below depicts the different amount of workload and hence stress the pilot faces during the different phases of flight. Stress/ Workload is highest during the critical junctures of flight which are taking off and landing.



Picture 1. Stress the pilot faces during the different phases of flight.

From a pilot's perspective, at critical junctures of flight such as take-off and landing, it would be best that pilots are at optimal performance. However, while cruising in flight, being in the middle of the upward portion of the curve would be sufficient although not at such a point that the pilot is under-aroused that important things like heading changes or reporting points are missed.

As such, the aim when performing their tasks is for all personnel to maintain the stress at a manageable level, below the fatigue point but not so low that the person is not alert.

An interesting point to note is that with continued efforts of stress management done, the stress curve can actually be increased to a higher level, resulting in higher and better performances.

Air Traffic Control (ATC) Stress

ATC is a highly stressful and demanding job due to presence of complexity involved. It requires balancing of controlling and de-conflicting of numerous aircrafts in a safe, efficient, orderly manner. ATC has to be prepared to respond in any unforeseen emergencies which may occur anytime such as weather development and aircrafts emergencies. To handle these kind of complexities ATC job requires spatial scanning, quick movement detection, image and pattern recognition, prioritizing the tasks on real time, fast visual and verbal filtering, coding and decoding, inductive and deductive reasoning. They also requires short term and long term memory, and mathematical and probabilistic reasoning.

Maintenance Stress

Aircraft makes money while flying and not when attended in the hanger, this makes aviation maintenance job stressful. Aviation maintenance personnel feels enormous stress in finishing maintenance within shortest possible time and make Aircraft functional and flyable to avoid flight delays and cancellations. While doing the job, there are also many things to be careful about in terms of using the correct tool, installing the correct parts when they work in dark tight spaces. The stress can be self-imposed by increasing one's expectations of themselves, this results in over loading by working harder than necessary to complete the job in the required time frame. The stress can also be from the manner or method that a manager uses to organize the employees. By not having the skilled "people" to effectively communicate information or tasks to the engineers on the hanger floor, the manager risks stressing the engineers out by a lack of information.

Flight-Crew Related Stress

For pilots and other crew members, even under ordinary conditions, the flight environment includes stressors such as noise, vibration, decreased barometric pressure, and accelerative forces. Fatigue and altered sleep-wake cycles also may be factors, especially for crew members on flights that span several time zones. Moreover, a study has found that the captain's personality type also influences the amount of stress on the flight deck.

Causes of Stress

Causes of stress are known as stressors.

Physical Stressors

These stressors add to the personnel's workload and make it uncomfortable for him/her in their work environment:

Temperature

High temperature in the cockpit/hangar increases perspiration and heart rate causing overheating of body.

Low temperature causes the body to feel cold, weak and drowsy.

Sudden changes in air pressure due to turbulence exerts unusual gravitational forces on the body. This makes difficult to control the aircraft.

Reading navigational charts and instrument becomes difficult due to aircraft vibration which is transmitted to body via aircraft seat.

Noise levels in a typical cockpit are in the range 75-80 dB. Anything above this causes stress and makes it difficult to concentrate and forces the pilot to have to strain to hear ATC instructions. Noise levels in the hangars are also high due to hangars situated near aircraft taking off and landing, making it difficult for maintenance personnel to focus and concentrate.

Poor Lightings at their work area make it difficult to read technical data and manuals whilst working on the aircraft and the use of torchlights are also inadequate, increasing the propensity to miss something important.

Confined spaces also hinder maintenance personnel from performing their tasks as their bodies are sometimes contorted in unusual positions.

Poor visibility due to heavy fog and traveling in instrument meteorological conditions

Psychological Stressors

Work related stressors prior to the mission can increase arousal due to apprehension but too much can cause over-anxiousness and failure to perform up to speed. i.e. in ATC, envisioning handling multiple aircraft and making sure all are de-conflicted and to ensure traffic handling in safe, orderly and in the most expeditious manner.

Financial problems such as approaching bankruptcy, recession, loans and mortgages to pay. Marital problems due to divorce or strained relationships due to persistent quarrelling.

Interpersonal problems with superiors and colleagues due to miscommunication or perceived competition and backstabbing.

Physiological Stressors

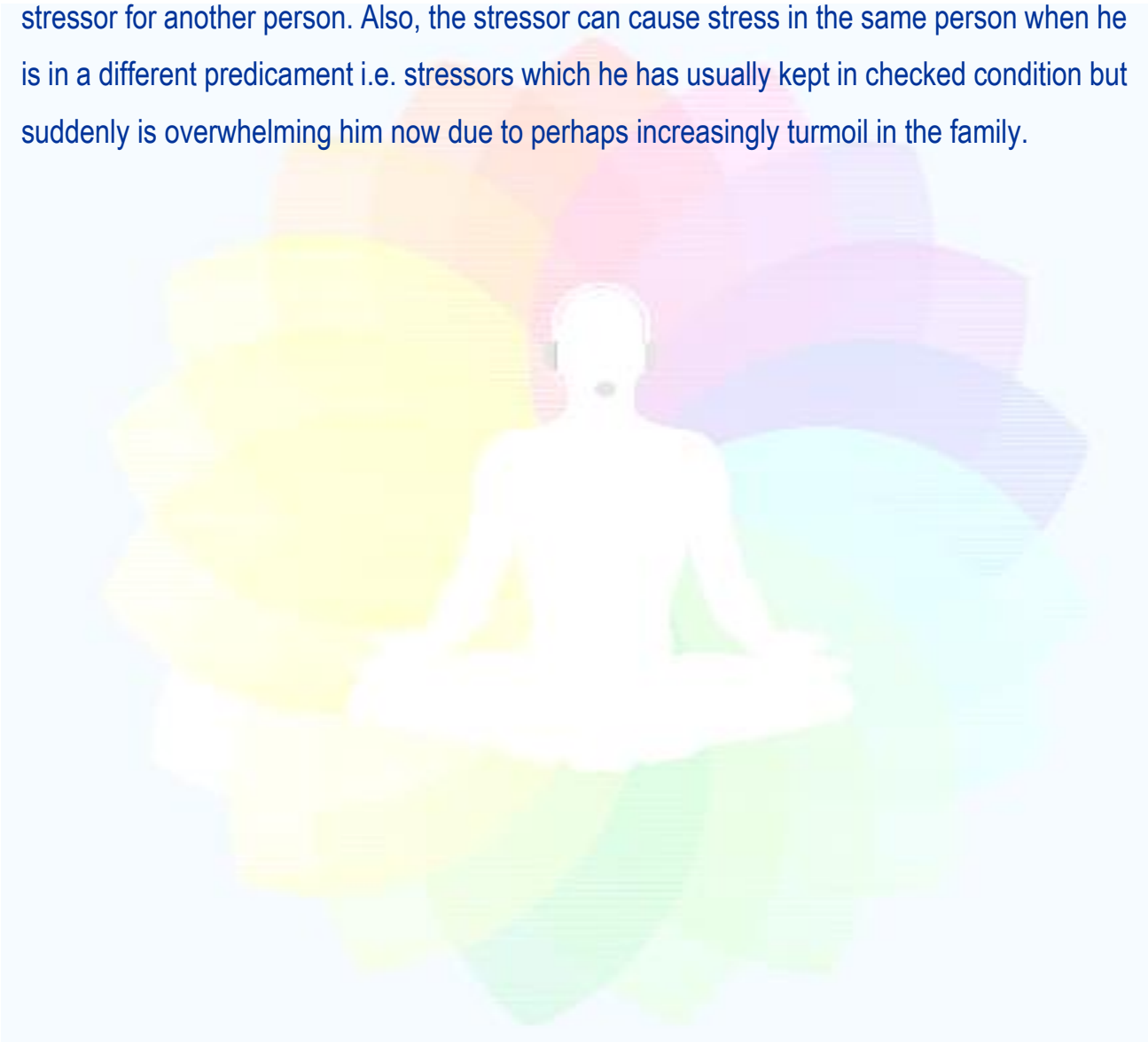
Healthy body is required to perform vital aviation tasks but if someone is flying unwell, it leads to performance degradation. Also not having adequate diet results in less energy level in the body which induces symptoms like headache and shaking

Due to lack of sleep and fatigue, the personnel is unable to maintain performance standards for long periods as he is struggling to stay awake due long working hours

Conflicting shift schedules affect the body's circadian cycle and leads to a degradation of performance.

Long hours working without taking appropriate break especially at busy airports when handling multiple aircraft departing and arriving on intersecting and parallel runways.

However, it is may be noted that a particular situation can bring about different degrees of complexity for different people. The situation can be a normal for one person but can be stressor for another person. Also, the stressor can cause stress in the same person when he is in a different predicament i.e. stressors which he has usually kept in checked condition but suddenly is overwhelming him now due to perhaps increasingly turmoil in the family.



CHAPTER 3: Handling Stress

Breath is the power behind all beings. I breathe in
and know that good things will happen.
Set Peace of Mind as your highest goal and
organize your life around it

People cope with stress in many ways. Specialists say that the first step in coping is to identify stressors and the symptoms that occur after exposure to those situations. Other recommendations involve maintenance of a healthy lifestyle regimen which includes proper rest, regular exercise, a wholesome healthy diet, controlled consumption of alcoholic drinks and avoidance of tobacco products.

Physical methods

- Maintain good physical fitness
- Have regular meals
- Have sufficient sleep
- Sound time management
- Control the physical environment

Psychological methods

- Psychologically
- Adequate preparation with regard to knowledge, skills and procedures
- Have confidence in your ability
- Have a well-balanced social, family life to have control over financial, domestic worries
- Share and discuss problems so as not to keep feeling stressed

- Solve problems as soon as possible to prevent snow-ball effect

Medications

Sometime medications play an important role in managing stress, but it is unlikely to give you more than a temporary respite from stress. So in order to take care of the stress two important things are to be addressed:

- Alter your ways to decrease the stress
- Change the ways in which the stressors are handled

Important ways to de-stress

- A. Training the body** - exercises to take care of the stress and also countering the ill effects of the stress
- B. Training the mind** - exercises, both physical and mental to take care of the thoughts and once this is done we can take charge of our lives
- C. Nourishing and replenishing** - taking care of our diet to counter the negative effects of the stress and refining and generating the life energy (prana) by various techniques
- D. Rebalancing** the responses and reactions if any;
- E. Professional help** to deepen the various techniques to counter the stress and psychological and medical help from the experts. Remember the medical help is there for countering stress for a short period and also has side effects which are not conducive for active working environment.

In all of these there is a common thread and that is breath. That is why we are emphasizing on the breath and various techniques to take the various units which contribute to the total health.

Breathing Right

Learning the correct way of breathing is a major component of good health, yet many of us spend our lives taking shallow breaths that can increase our stress levels. For most of us, breathing is nothing more than an automatic function that keeps us alive, a steady flow that brings in oxygen and expels carbon dioxide. But unlike heartbeat or digestion, breathing is a bodily function we can consciously control. Breathing can have a wonderful impact on our well-being. By paying regular attention to our breath, we get a good reading on our mental and emotional state. You can also tap into an easy and effective way to manage stress and anxiety. Though we usually take it for granted, we use the breath in lots of different ways every day: gasping when we cry, hyperventilating when we are panicked and breathing deeply when we laugh. But most of us still live day-to-day taking shallow, unconscious breaths—and that's not good for us. A lot of people don't realize that they aren't breathing properly. We breathe in a way that reflects stress—and by breathing that way, we're actually sending a message to our nervous system that we are stressed.

How to breathe with your diaphragm

To understand proper breathing, watch an animal or a new-born baby while they are sleeping—they breathe steadily and effortlessly from their bellies. But by the time we are four or five years old, we have already learnt improper breathing habits, and they soon become ingrained. Eventually we keep breathing in an unhealthy way for years. To change our breathing, we have to put effort into changing our habits. The first step toward using our breath more effectively is to pay attention to it. First step is unlearning the wrong ways of breathing and then forming the new grooves which help us in taking our breaths in a right manner. Observe and notice what our breath is doing when we're stressed, when we're happy, or are anxious, while exercising, all that - once we understand the way we breathe, we can start to

modify it. Breathing is integral to most forms of yoga—and is ultimately a more important part of the practice than the physical postures. The Sanskrit word, *prana*, also means life energy, and it's a vital indicator of our overall well-being. *Prana* movement is there all through the body. Breath is the vehicle for *prana*.⁽³⁾ That is why by taking care of our breath, we can take care of this life energy all through the body. Practices that incorporate the breath—like yoga, are good places to start in learning how to use our breath more effectively.

Learning good breathing techniques

The key to good technique is learning how to breathe with our diaphragm. Diaphragm is the muscular structure which separates the chest from the abdominal area. That's the muscle beneath our rib cage, the same one we use for singing or laughing. People who have excelled in their fields are the one who know the art of diaphragmatic breathing (athletes, artists, etc.). If we are breathing properly, we can feel our diaphragm pushing down into our belly. The abdomen goes out while we are breathing in and goes in while we are breathing out. If we are guilty of holding in our stomach so that it looks flatter—and many people are—then we definitely are not using our diaphragm properly. And utilizing the diaphragm is the key to letting go of stress.

Learning to control the breath is as simple as taking long, deliberate inhales at designated times throughout the day. If we are counting to three as we breathe in, and then again as we exhale, making each inhale and exhale the same length, initially, without pausing - not only does this make us aware of our breathing patterns, but it forces us to calm down and draws our focus inward, like meditation does. It is also suggested to lie down with a pillow under the upper back as an even easier method to practice calm breathing. Once we get good at it, we can practice calm breathing while we are walking, doing dishes, sitting in the car at a traffic light or waiting for the meeting to begin.

Finding a daily breathing routine

Deep breathing or diaphragmatic breathing is recommended for at least 20 minutes a day; It is said even practicing for two minutes every hour will have noticeable benefits. It will completely change our mental and emotional state. As an added bonus, good breathing has physical benefits for the whole body, as it helps reduce acidity. If you have chronic acidity (unable to release the toxins properly) in your body tissue, you will have a greater tendency to develop chronic diseases. To better understand the benefits of diaphragmatic breathing, we need to understand the anatomy and physiology of the respiratory system.

Anatomy and physiology of the respiratory system

If we consider our body as a tubular structure, it has two main parts upper part is thoracic (chest) region and the lower part is abdominal region. These two regions are separated by the strongest muscle in the body called diaphragm. The thorax has two most important structures of the body called lungs and the heart. Lungs are two in number -right and left ones. On the right side lung has got three lobes upper, middle and lower while on the left side lung has mainly two lobes upper and lower. Because of the gravity the lower lobes on both the sides have the best blood supply while the middle lobe has a reasonable blood supply while the upper lobe has a poor supply. This makes, any breathing which inflates the lower lobes as the best one. As a result, we can infer that the diaphragmatic breathing (also called belly /abdominal breathing) is the best one physiologically. Its most efficient one too as it decreases the workload on the heart and gives a massage to various abdominal organs also. It leads to best ventilation perfusion ratio. Diaphragmatic breathing increases the venous return and thus making the circulatory system very efficient. Another very important advantage is it activates the parasympathetic nervous system which leads to mental relaxation and de-stressing the body. Breathing is the process of inhaling the air in and exhaling the toxins (carbon dioxide) out. When we talk about respiration that includes the

breathing as well as the gaseous exchange which occurs at the alveolar level between the lungs and the blood vessels. Lungs are spongy structures and has very good elasticity. When we breathe through the nose the air enters the nostrils followed by the nasal passages and then into the trachea (wind pipe) which further divides into two main bronchi and the bronchioles and finally alveoli. If we look at the lung structure it resembles an inverted tree. The alveoli have very thin membranes and are grape like structures which are surrounded by the thin vessels called capillaries. It is here that the gaseous exchange takes place -oxygen going into the arterioles from the alveolus and toxins in the form of carbon dioxide going from the blood vessels to the alveoli (lungs).

Quick Diaphragmatic Breathing Routine (QDBR)

Get relaxed quickly. QDBR exercises help reduce anxiety and tension immediately. You can do them with your eyes open or closed. You can do them anywhere, any time, and no one will know that you are doing them. Some good times to “do a QDBR” are when you are:

- Stuck in traffic
- Put on hold during a phone call
- In your doctor’s waiting room
- Someone says something that upsets you
- Waiting for a phone call
- Waiting for the meeting to begin
- Feeling overwhelmed by what you need to accomplish in the near future
- Standing in line
- Try to find two minutes anytime & anywhere

Method of QDBR

The basic method for doing a QDBR is quite simple: Put your hand just below your navel. Take a deep breath, bringing the air in through your nose. You should feel your stomach rising about an inch as you breathe in, and falling about an inch as you breathe out. This is diaphragmatic breathing. If this is difficult for you, lie on your back or on your stomach, where you will be more aware of your breathing pattern. Remember to relax your stomach muscles.

Here are some variations:

- QDBR Version 1 Count very slowly to yourself from 10 down to zero, one number for each breath. With the first diaphragmatic breath, you say “10” to yourself, the next breath, you say “nine”, etc. If you start feeling light-headed or dizzy, slow down the counting. When you get to “zero”, see how you are feeling. If you are feeling better, great! If not, try doing it again.
- QDBR Version 2 As you inhale, count very slowly up to four. As you exhale, count slowly back down to one. Thus, as you inhale, you say to yourself, “one, two, three, four”. As you exhale, you say to yourself, “four, three, two, one.” Do this several times.

CHAPTER 4: Why Breath?

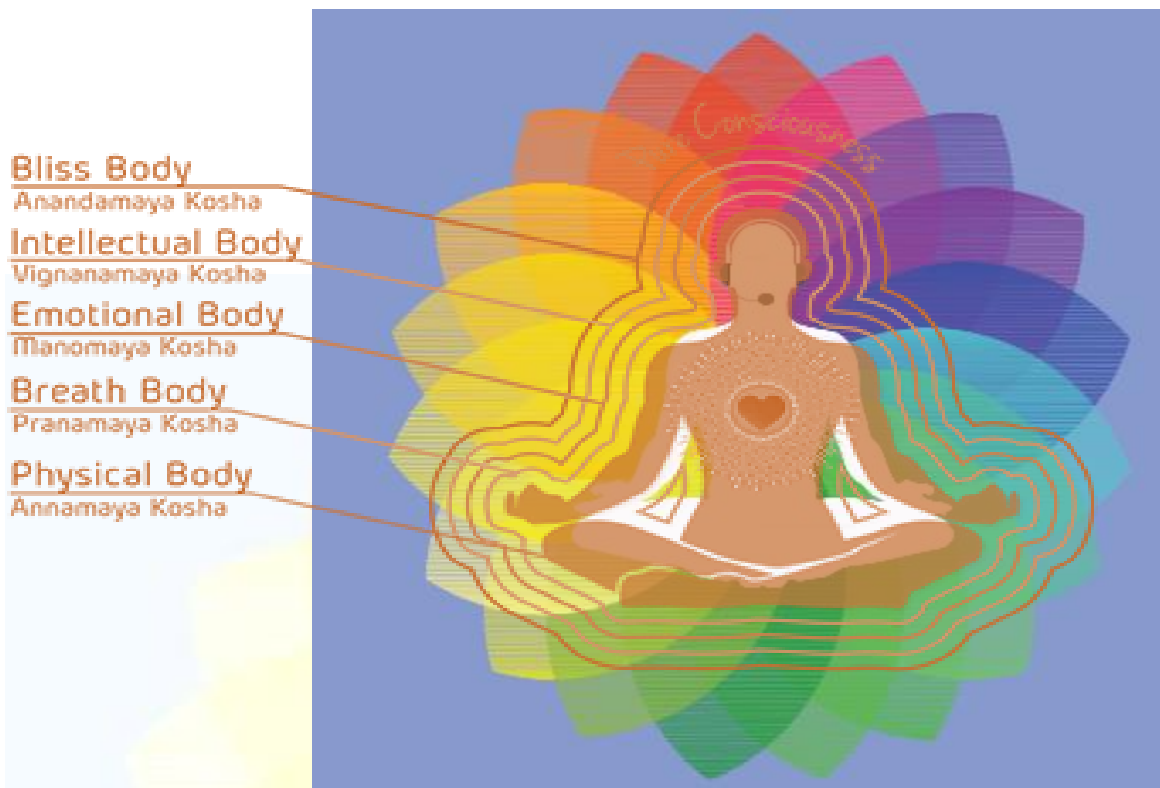
Take charge of your breath, take charge of your life.

Master your breath, master your life.

We can use our breath anytime anywhere to take charge of the life. Prana (“pra” means first /basic unit and “na” means energy) is the life energy which needs to be activated to control our nervous system. Emotions, nervous system and breath are inter-related. In fact, emotions and breath are said to be a two-way street. There are countless systems in our body. They are either voluntary or involuntary. Breathing is the only system, which although involuntary, can be made voluntary to a large extent and that’s the master key which has been used by the eastern masters (yogis) to take charge of their health and lives. It has been proven that respiratory rate is directly proportional to the number of thoughts in our mind. Also it is related to our health and longevity. The animals with high respiratory rate have less lifespan and the animals with low respiratory rate have a long life. Breathing has three important components

- 1) *learning the correct way of breathing*
- 2) *breath awareness*
- 3) *conscious breathing*

According to the most ancient concept of the human body based on the ancient scriptures⁽⁴⁾, it is a five-fold structure. They are represented by the sheaths (layers), namely:



Picture 2. Pancha Kosha or Five Sheaths of Human Body

PHYSICAL BEING This represents the physical body. It needs food and nourishments to thrive. Yogic exercises and the food we take are meant to take care of this layer.

BREATH BEING This represents the layer next to the physical body .It denotes the prana (life energy) layer. It also has the flow of nervous system and circulatory system. It is represented by the Respiratory system. It can be taken care by taking care of breath and various exercises related to controlling the breath. Breath is the vehicle for the life energy (Prana). Breath is the connecting link between the physical and mental sheaths. By taking care of the breath we can take care of both the body & the mind.

MIND BEING This is the mind which governs perception of the environment around us and it is where one's sense of self develops, along with the way it behaves. 'Yoga-nidra' transcends the two outer sheaths to allow the Mind Being to be penetrated.

INTELLECT BEING This is the conscious sheath and intellect which governs one's sense of ethics and morals. It is also responsible for inner growth and the acquisition of knowledge, which can occur through studies of ancient texts.

BLISS BEING- which opens our heart to our own divine being. We can awaken our bliss sheath through three practices. The first is selfless service. This opens our heart to our innate unity with other beings. The second is devotion to God. This opens our heart to our unity with the all-pervading Divine Being. The third is intensely focused yogic practices.

Every cell in the body needs to breathe -requiring oxygen, generating energy (ATP) and giving off carbon dioxide (toxins). Approximately 70 percent of toxins are excreted by the lungs and rest of the 30 percent by the excretory systems which includes kidneys and by skin through sweating. The process of cellular respiration, depends on an exchange of gases. This exchange is in two steps -one inhalation where air is taken in and oxygen diffuses from the alveoli to the blood capillaries and in the second step this oxygen from the blood vessels is taken from the lungs to the heart and then to the cells of the body. Carbon dioxide moves in the opposite direction. All activities of the respiratory system are helping in the movement of the gases. Airways lead from the nose and mouth into the. It passes through the palates, pharynx, larynx trachea, right and left bronchi, and then into two lungs. The bronchi divide into various bronchioles. This whole structure is constituting what is called the bronchial tree. The terminal bronchioles in turn open into the alveoli. It passes through the palates, pharynx, larynx, trachea, right and left bronchi and then into two lungs. The bronchii divide into various bronchioles. This whole structure is constituting what is called the bronchial tree. The terminal

bronchioles in turn open into the alveoli. The pharynx is a crossroad for the passage of air and food. The glottis, which is the narrow opening in the larynx almost at the level of the vocal cords, closes when we swallow alveoli remain open because of a special surfactant on their wall limits the expansion during full inhalation and also prevents there collapsing lungs during the full exhalation. It passes through the palates, pharynx, larynx trachea, right and left bronchi and then into two lungs. The bronchii divide into various bronchioles. This whole structure is constituting what is called the bronchial tree. The terminal bronchioles in turn open into the alveoli. The lungs have an inherent elasticity. Nothing lies in between the outer surface of the lungs and the chest wall except a potential space called pleural cavity Inhalations can take place only as a result of muscular activity. The size of the lung follows the size of the chest. Anything that effects the chest size also effects the lungs similarly. The three main group muscles of respirations are chest muscles (intercostal), the abdominal wall and the respiratory diaphragm.

CHAPTER 5: Breath Works

Feelings come and go like clouds in a windy sky.

Conscious breathing is my anchor.

Breath works is a scientific term which has three components⁽⁵⁾. The three types of breathing are - clavicular (apical), thoracic (chest) and diaphragmatic (abdominal /belly).

Clavicular Breathing - It mainly fills air in the upper lobes. When we try to deepen the chest breathing it automatically becomes clavicular breathing. As the blood supply to it is less compared to the other parts of the. Hence not the most efficient of the breathings

Thoracic Breathing - This type of breathing acts predominantly on the middle part of the lungs. This part also has a reasonable blood supply and that makes it more efficient physiologically

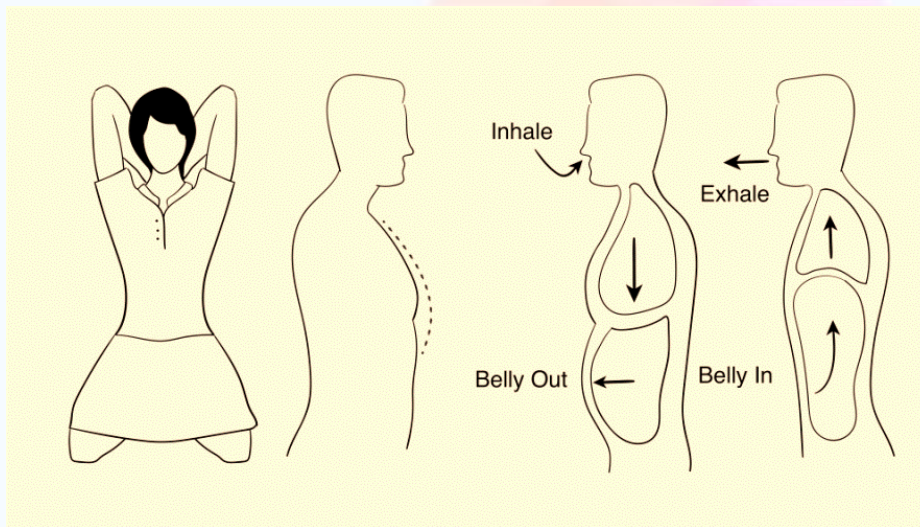
Diaphragmatic Breathing - it is also called as belly breathing/abdominal breathing. This is physiologically the most efficient type of breathing. It mainly acts on the lower part of the lung and this part being the most dependent part has ample blood supply. This variety of breathing being most efficient decreases the work load on the heart too. Diaphragmatic breathing increases the venous return thus making the circulatory system more efficient, it also helps by massaging the heart and the abdominal organs. Diaphragmatic breathing activates that part of the nervous system which relaxes and counters the effect of the stress.

Once we have learnt the art of diaphragmatic breathing, we have to add the qualities of a good breath which include

- nasal breathing

- noiseless, rhythmical
- smooth without any jerks
- no pauses during the breath cycle
- inhalation/exhalation ratio of 1:2 (means exhalation has to be twice the length of inhalation).

Increasing the length of exhalation is very important to derive the benefits of stress free living



Picture 3: Exercise showing Increasing the length of Exhalation

1. **Breath awareness** - Breath awareness is the goal, which we all have to achieve, ultimately. It simply means being witness to the process of breathing. Just observing it without getting involved in the process. And it will deepen only when we have learnt the art of diaphragmatic breathing. Learning and incorporating diaphragmatic breathing is the real basis
2. **Conscious Breathing** - Here we learn the art of manipulating the inhalation (breathing in) and exhalation (breathing out) and adding the holding of breath to take care of the mind and intellect. Here the aim is to finally decrease the respiratory rate by increasing the length of the inhalation and exhalation both.

CHAPTER 6: Ways to Keep Good Health

To keep the body in good health is a duty, otherwise we shall not be able to keep our mind strong and clear

A lot of factors play a role in staying healthy. In turn, good health can decrease the risk of developing certain conditions. These include heart disease, stroke, some cancers, and injuries.

Healthy eating habits and maintaining the ideal weight

Many of us are overweight. Carrying too much weight increases your risk for several health conditions. These include:

- high blood pressure
- high cholesterol
- type 2 diabetes
- heart disease
- stroke
- some cancers
- gall bladder disease etc.

Being overweight also can lead to weight-related issues. A common problem is arthritis in the weight-bearing joints, such as your spine, hips, or knees. There are several things you can try to help you lose weight and keep it off.

Maintaining the body weight based on the BMI is very important. First we need to be aware of the ideal body weight. It not only depends on our physique but also on the nature of the work we do - whether it is sedentary or requires physical work. For pilots, it is sedentary, while

for ground staff there is a lot of physical activity. This needs to be taken into consideration for calculating the ideal weight required.

Exercises to keep yourself healthy

Exercise can help prevent heart diseases, stroke, diabetes, and other chronic ailments. It can help treat depression, osteoporosis, and high blood pressure. People who exercise also get injured less often. Routine exercise can make you feel better and keep your weight under control. We must try to be active for 30 to 60 minutes about 5 times a week. Any amount of exercise is better than none. So we must make a new beginning today.

Healthy lifestyle

Unhealthy lifestyle counters the benefits of a balanced diet and exercises. Important aspects are limiting alcohol intake, avoiding smoking or drug use, limited tea/coffee intake, managing stress and adequate sleep. Healthy lifestyle is a must if we have to reap benefits of healthy eating and exercises for health. These things are complimentary. All three steps are important, and that is why for the fullest and the best results, we need to work on all the three. In addition to the factors listed above, you should make time for whole body health. Visit your doctors for regular check-ups. This includes your primary doctor, as well as your dentist and eye doctor. Preventive care can detect disease or prevent illness before it starts. This includes certain doctor visits and screenings.

CHAPTER 7: Routine Exercises to Keep yourself Healthy

True enjoyment comes from activity of the mind and exercise of the body; the two are ever united

Exercises help us by strengthening the muscles and joints both. Exercises basically take care of the physical being. When we are physically fit, only then we can think of taking care of our breath to take charge of our life. The exercises be it aerobic cardio, be it gym exercises, be it pilates, or be it yoga, help by raising the level of endorphins in the body. This gives a sense of well-being. It also strengthens the muscles leading to the increased basic metabolic rate (BMR). These exercises can be helpful in maintaining a healthy weight too.

Ashthanga Yoga (Modern Day form of classical Indian Yoga)

It consists of eight steps to reach the pinnacle of Samadhi. The eight steps are

1. Yama (restraints)
2. Niyama (observances)
3. These two steps are a precursor to our goal of good health
4. Asanas (physical exercises)
5. Pranayama (breathing exercises)-this is the single most important step in our pursuit of the total health
6. Pratyahara (sense control) helps by controlling of dissipation of the energy
7. Dhrana (one pointed mind)-helps in increasing the concentration and sharpening the intellect

8. Dhyān (meditation)-totally takes care of physical, mental, social and spiritual aspects of the body

9. Samādhi (knowing your true self)

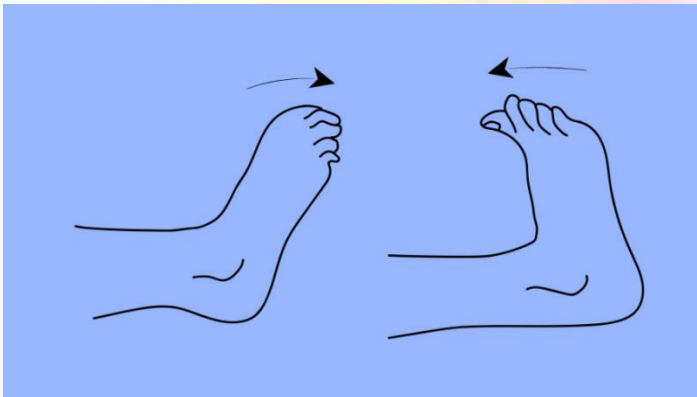
EXERCISES FOR STRENGTHENING THE BODY MUSCLES AND DEEPENING THE BREATHS

Most of these exercises can be done in the limited space in which the aviation professionals function

Feet and Legs

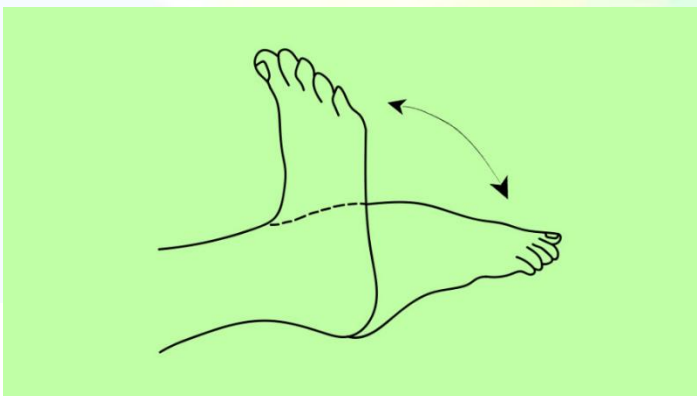
With legs outstretched:

- Alternate curling and stretching the toes. Repeat three times and relax.



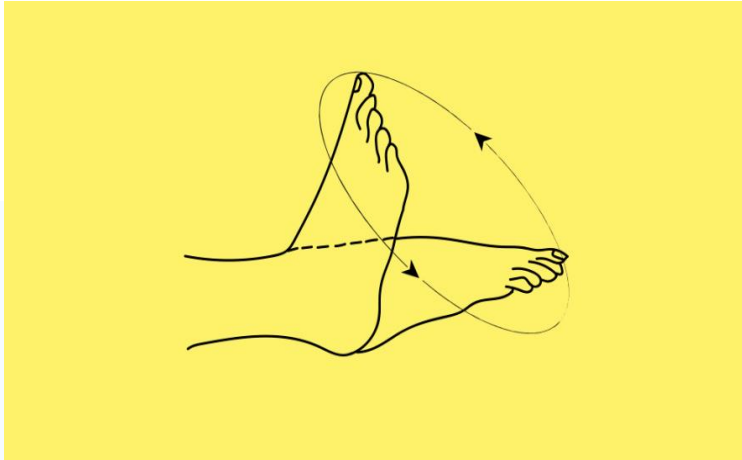
Picture 4: Alternate curling and stretching the toes

- Alternate bending (flexing) and stretching (extending) the whole foot at the ankle. Repeat this movement three times.



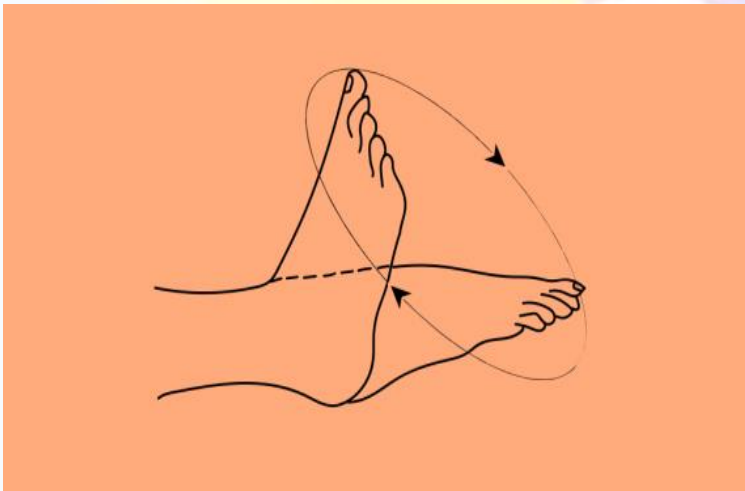
Picture 5: Alternate bending (flexing) and stretching (extending) the whole foot at the ankle

- Rotate the ankles in the clockwise as if drawing circles with your toes. Repeat three times.



Picture 6: Rotate the ankles in the clockwise

- Rotate the ankles in the anticlockwise direction. Repeat three times.



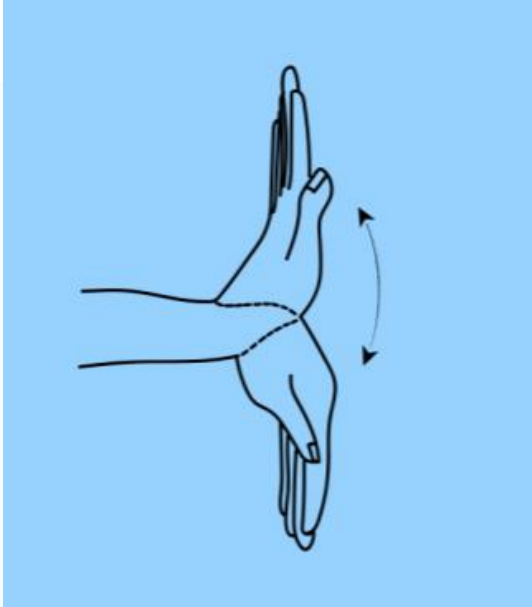
Picture 7: Rotate the ankles in the anticlockwise direction

- Dancing knee caps- pulling the patella and then relaxing –Repeat five times.

Arms and Hands

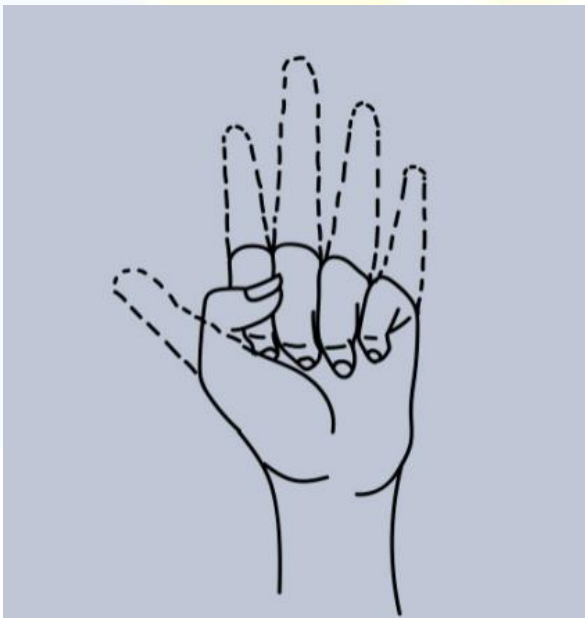
With arms extended out in forward-facing with respect to your body:

- Move your hands up and down, bending from the wrist. Repeat three times.



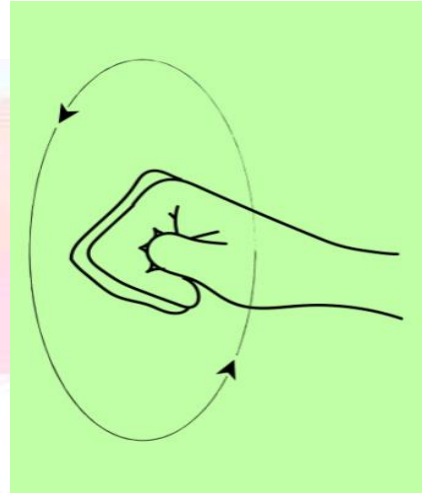
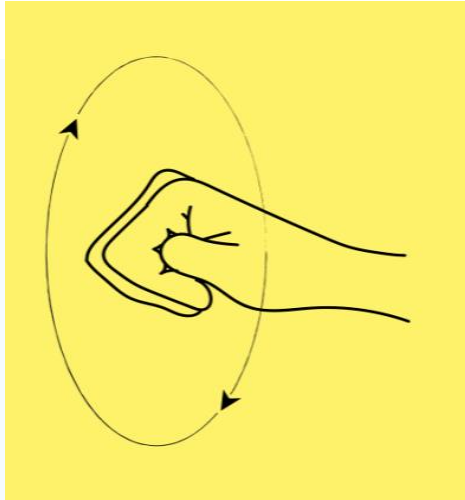
Picture 8: Moving hands up and down, bending from the wrist

- Make a fist while alternately stretching your fingers, then making a fist. Repeat three times.



Picture 9: Make a fist while alternately stretching your fingers

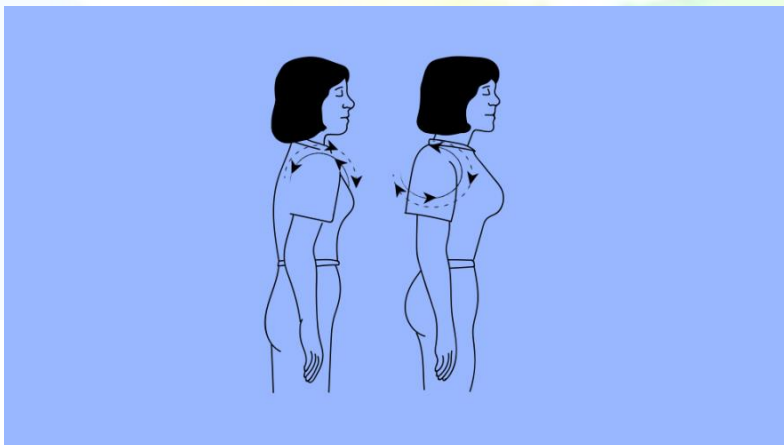
- Rotate your wrists three times, first to the clockwise (right), then to the anticlockwise (left). Relax. Repeat three times.



Picture 10 a & b : Rotating wrists three times, first to the clockwise and then anticlockwise

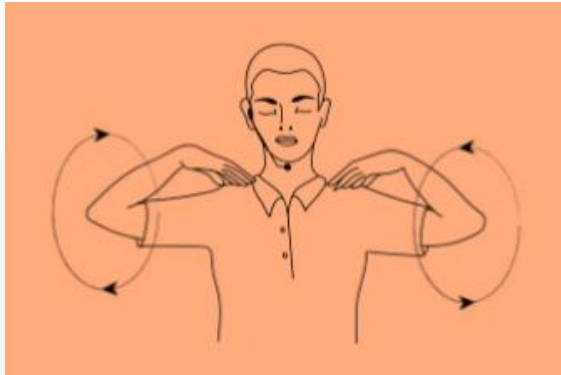
Shoulders

- While inhaling raise your right shoulder up toward your ear. On the exhale, release your shoulder down. Repeat three times.
- Move your right shoulder forward. On the exhale, return it to the starting position. Repeat three times.



Picture 11: Inhale and raise your right shoulder up and exhale release shoulder down.

- Move your right shoulder back. On the exhale, return it to the starting position. Repeat three times.

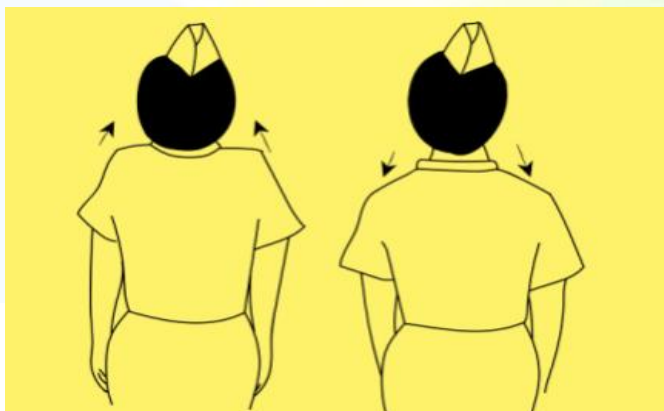


Picture 12: Move your right shoulder back, on exhale, returning back

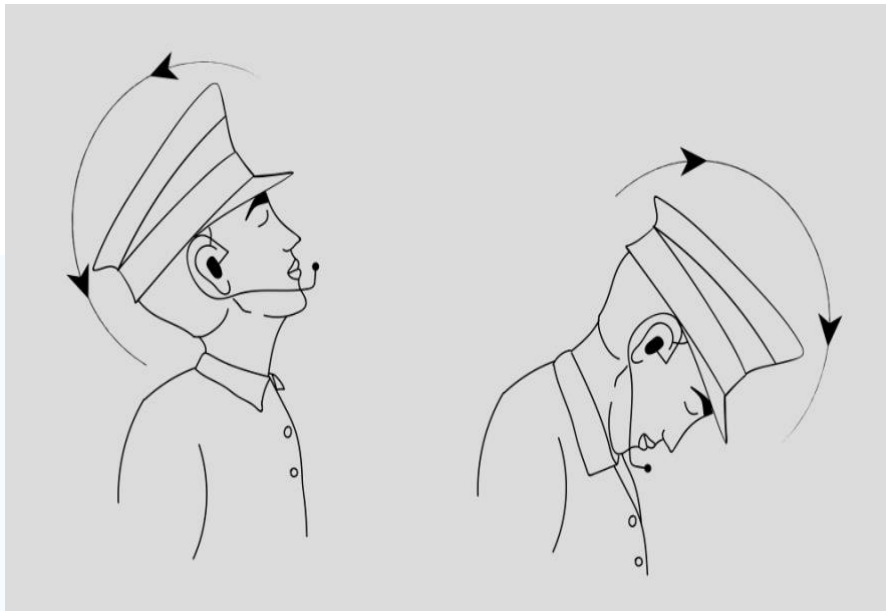
- Repeat the sequence on the left side.
- Fold your arms and touch the shoulders with the hand fingers. Move the wings in linear motion and clockwise and anti-clockwise motions
- While inhaling bring both shoulders up towards your ears keep it tense and then drop your shoulders down as you exhale. Repeat three times.

Head and Neck

Hold each of these positions by taking three easy breaths and relaxing tension with each exhalation and then return your head to upright position (centre) before doing the next movement.

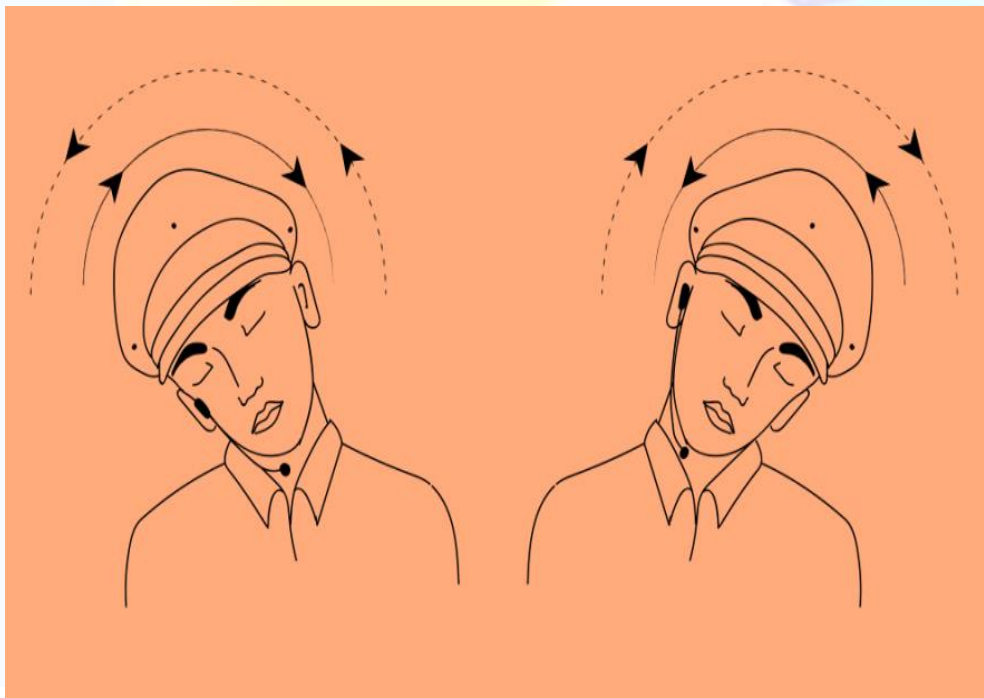


Picture 13: Hold positions by taking three easy breaths and relaxing tension with each exhalation and then returning head to upright position



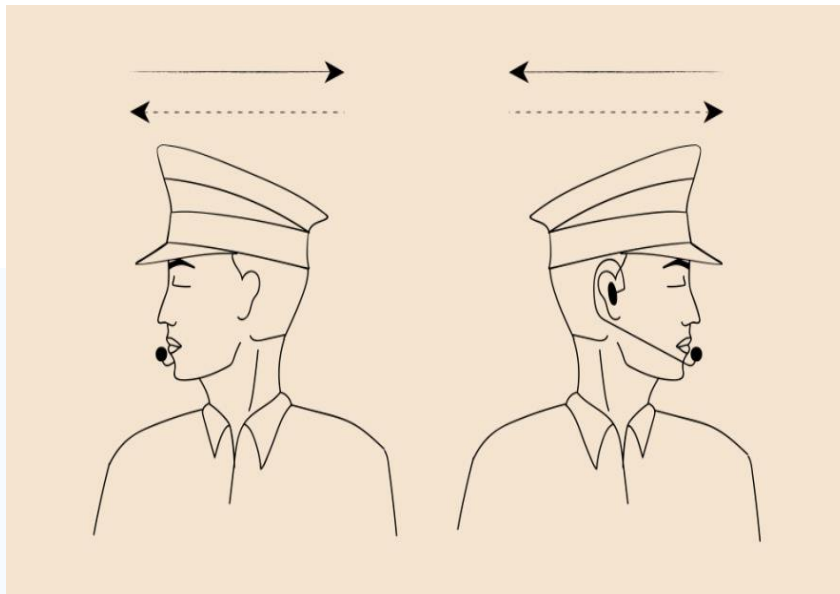
- Drop your chin close to your chest. Feel the weight of your head, stretch out the back of your neck and Hold.
- Similarly take your head back and hold

Picture 14: Drop your chin close to your chest to feel the weight of your head.



- Bend your right ear towards your right shoulder and Hold.
- Bend your left ear towards your left shoulder and Hold.

Picture 15: Bending right/left ear towards right/left shoulder and Holding



- Look as far as you can see over your right shoulder. Hold.
- Look as far as you can see over your left shoulder. Hold.

Picture 16: Looking far to see over right/left shoulder and holding.

Forehead

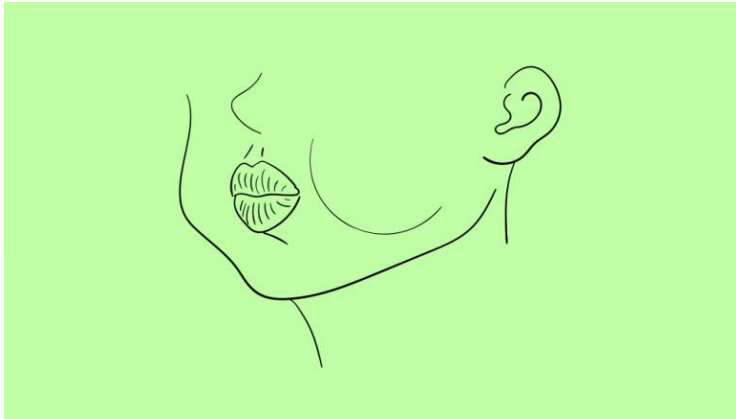
- Squeezing the forehead with eyebrow raising. Repeat five times.

Eyes

- Blinking -slow and fast. Repeat five times.
- Eyeball movements-towards right and then towards left. Repeat five times.
- Eyeball movements-towards up and then down. Repeat five times.
- Eyeball Circles-both clockwise and anti-clockwise. Repeat five times.
- Eye focussing -far to near and sideways. Repeat five times.
- Eye squeeze and relax. Repeat five times.

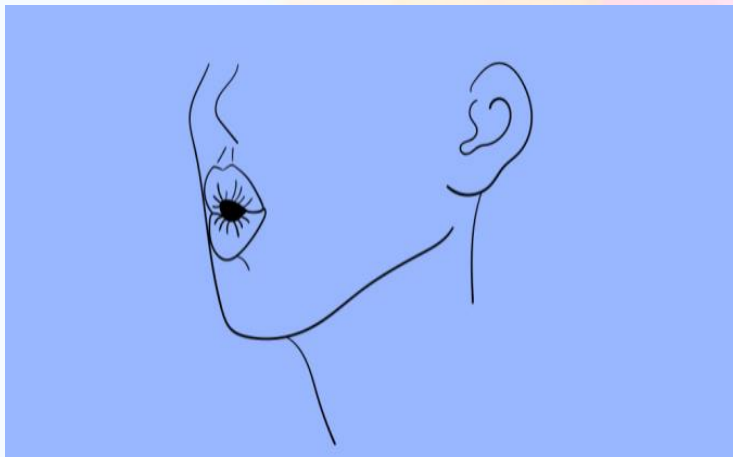
Face

- Half squint -contracting all the muscles of the face on right side and left side separately. Repeat three times.
- Full squint -contracting all the facial muscles on both the sides. Repeat three times.



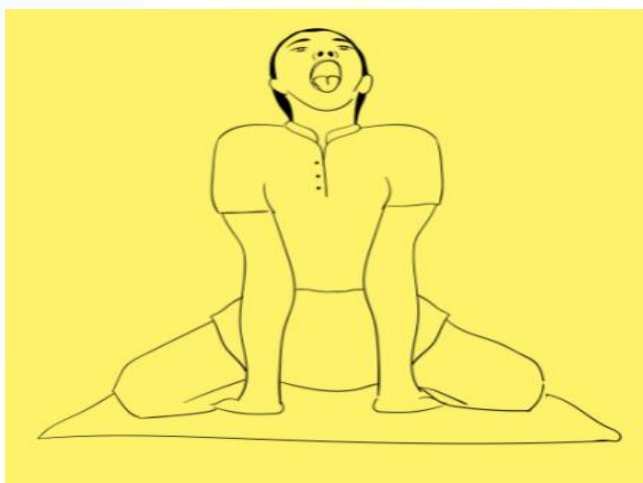
Inflating the cheeks with air –
Repeat----

Picture 17: Inflating the cheeks with air and repeating.



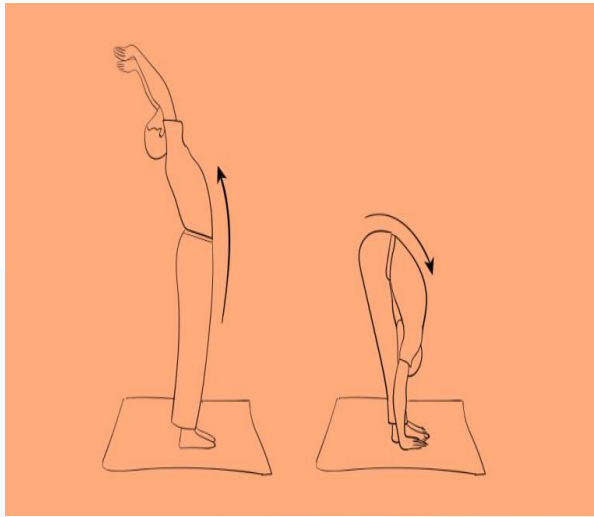
Mouth
shapes -making O using the lips

Picture 18: Inflating the cheeks with air and repeating



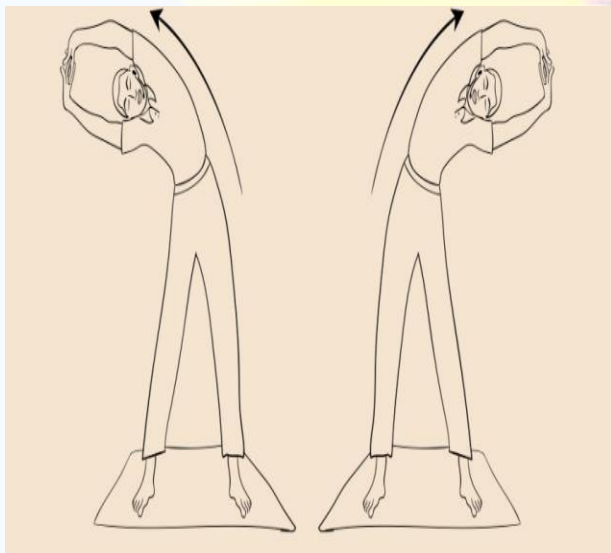
- Lion pose -taking the tongue out and stretching it as far as possible
- Stretching lips in a wide grin
- Curling the lips up and down
- Curling the lips towards the nose
- Pulling the lower jaws up and then relaxing

Picture 19: Lion Pose taking the tongue out

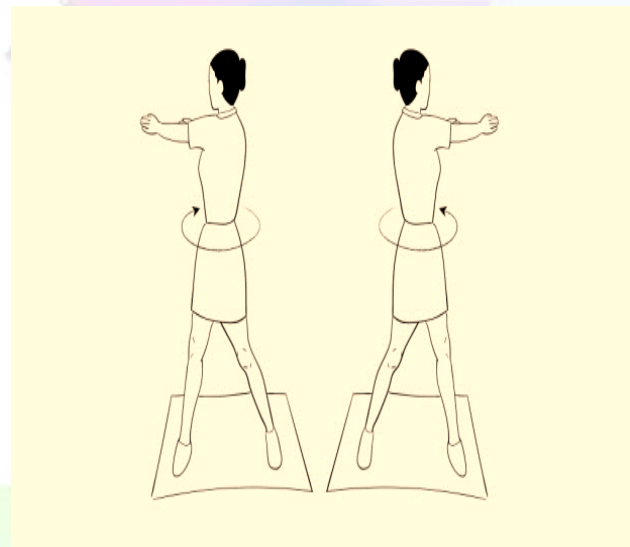


- **Spinal exercises** (can be done in both the sitting and standing positions)
- These are targeted to make the spine flexible and includes six poses
- **Forward bend**
- **Backward bend**

Picture 20: Spine Exercise



Picture 21: Sidebends –Right And Left



Picture 22: Twisting The Spine Right And Left

Chest MUSCLE Exercises

Chest breathing-slow to fast

Chest opener 1-arms above the shoulders

Chest opener 2-arms moving sideways

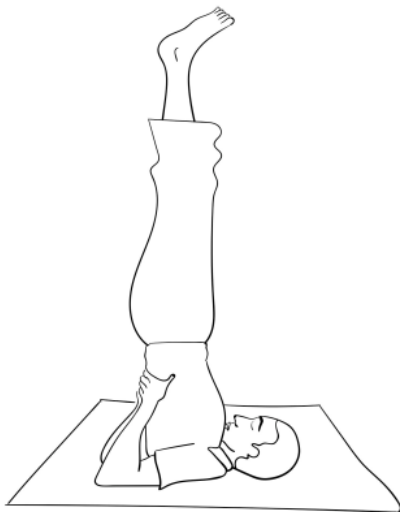
Chest opener 3-arms going up and at the back



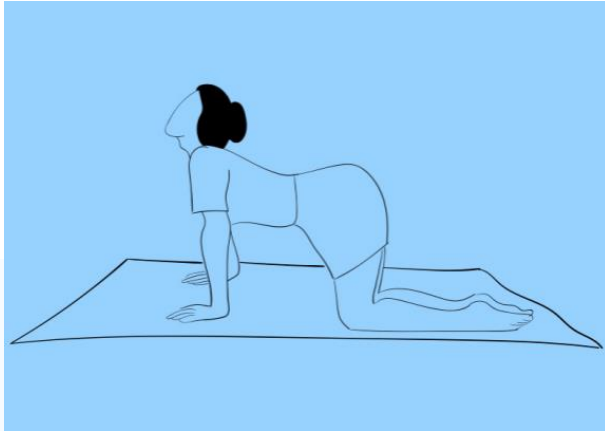
Picture 23: Chest Muscle Exercise

Diaphragmatic strengthening exercises

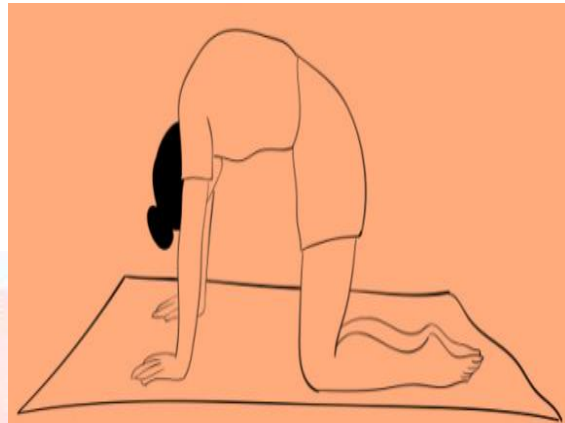
Inversion poses (asanas)(leg raise



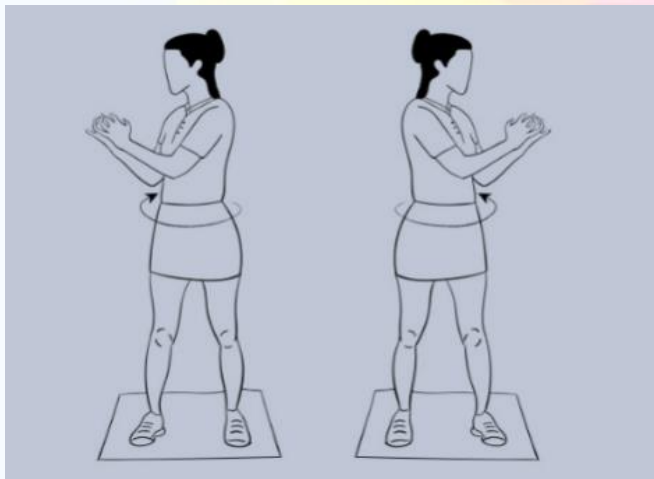
Picture 24: Diaphragmatic strengthening exercises



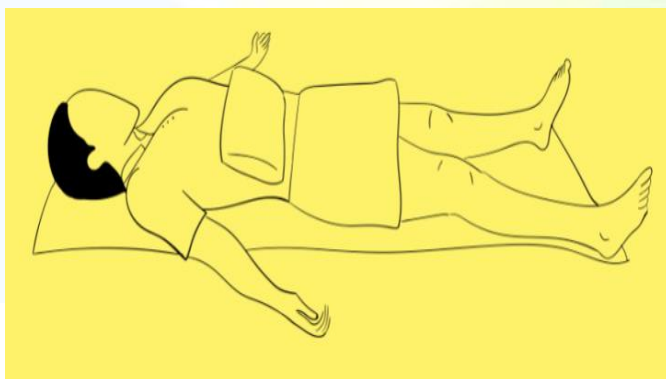
Picture 25: Cat Pose



Picture 26: Cow Pose



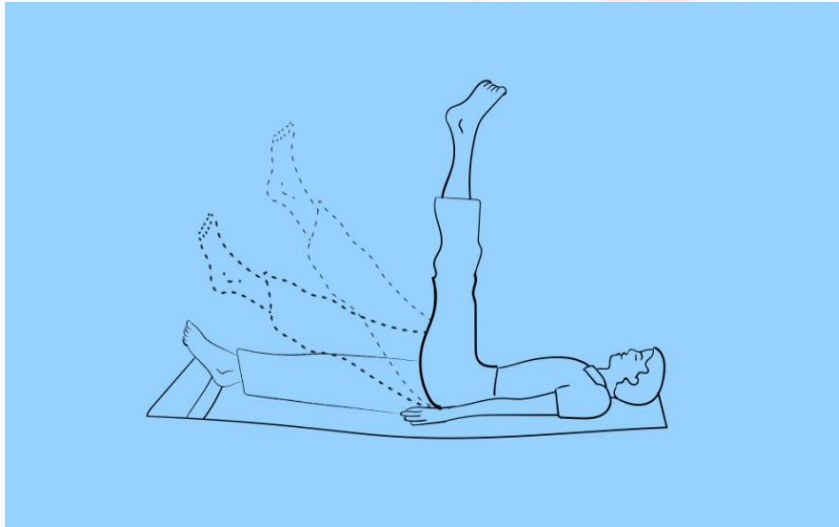
Picture 27: Twisting The Spine-Right And Left



Picture 28: Diaphragmatic Strengthening exercise using Sandbags

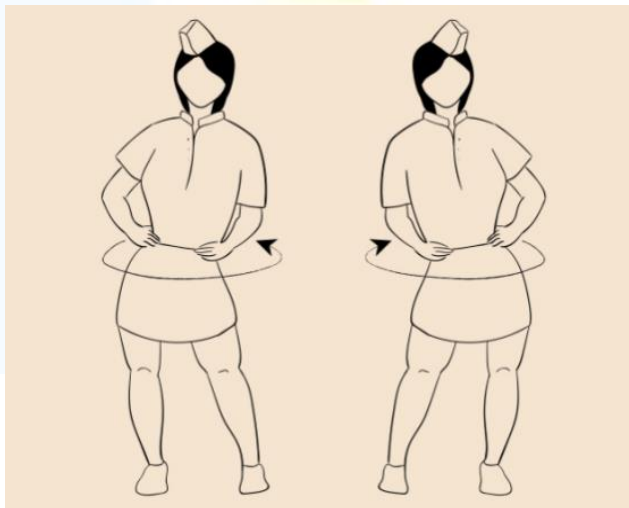
Abdomen Wall Strengthening

- Abdomen strengthening exercises-inhalation and exhalation Using The Wall Movement
- Lie on your back and raise your legs upto 45 degrees and hold it for 10 secs
- Lie down on your back and raise your legs at 60 degrees, hold for 10 Sec
- Lie down on your back and raise your legs at 90 degrees, hold for 10 Sec



Picture 29: Abdomen Wall Strengthening

Hip Rotation -Clockwise & Anti Clockwise



Keep your hands on your waist and rotate your hips clock-wise and anti-clockwise. Repeat for five rotation each.

Picture 30: Hip Rotation - Clockwise & Anti Clockwise

Ashwini Mudra (Anal Contraction) Stage 1

Contracting and pulling up the anus and while holding the anus contracted take 10 breaths

Ashwini Mudra (Anal Contraction) Stage 2

Contracting and pulling the anus up and then relaxing –repeat this cycle 20 times

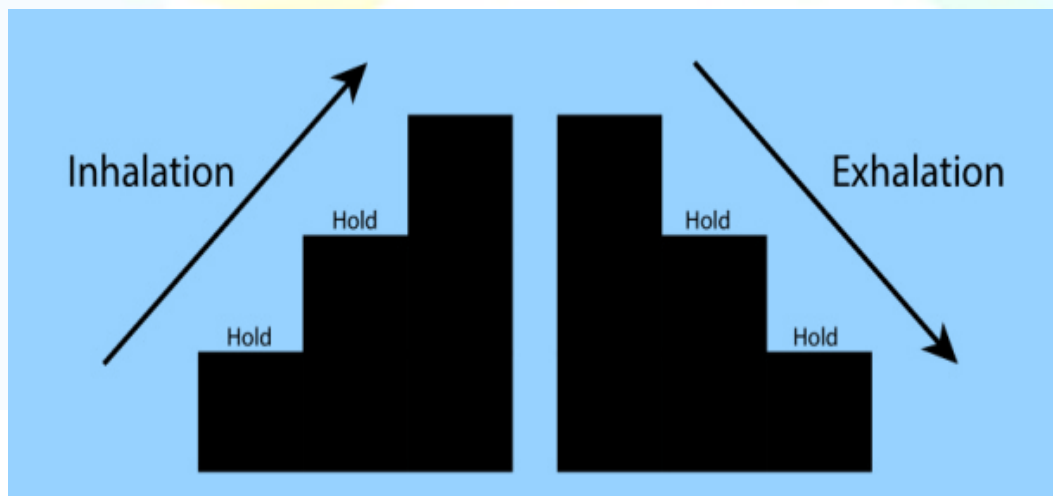
Holding the Bladder

- Holding the bladder and relaxing alternately as if holding the urine. Repeat five times.

Exercises specifically for breathing

Lengthening of I : E (Inhalation to Exhalation) ratio

- Purse lip /straw breathing
- Chanting (as we can speak only while exhaling)
- Step ladder pattern (can be used for increasing the length of both, inhalation and exhalation)
- Agnisara- inhalation and exhalation with focus in the lower abdomen (pelvic area)



Picture 31: Lengthening of I : E (Inhalation to Exhalation) ratio

Progressive Muscle Relaxation

*Be careful and try not hurt yourself while tensing your muscles. If you feel intense or shooting pain while completing this exercise stop immediately. Gently make the muscle tension. If you have problems with pulled muscles, broken bones, or any medical issue that would hinder physical activity, consult your doctor before doing these movements. Progressive muscle relaxation is another effective way of stress relieve. This relaxation method is widely used strategy for stress relief and also it is a great technique for reducing overall body tension. Progressive muscle relaxation is divided into a two-step process in the first step you will tense and in the next step relax different muscles in the body. With regular practice, progressive muscle relaxation will help you to recognize what tension as well as complete relaxation feels like in the different parts of your body. Even from the first sign of muscular tension that accompanies stress can be spotted and counteracted by using this awareness. The mind feels relaxed as your body relaxes. Additional level of relief from stress is achieved by the combination of deep breathing with progressive muscle relaxation. You can shorten the procedure by practicing tensing and relaxing all the muscle groups in your body, you can rapidly relax your whole body. With reduction of tension in your body, your body feels less stress and enjoys increased physical and emotional health. Before start make sure: You find a quiet place and several free minutes for practicing progressive muscle relaxation.

Make yourself comfortable by

1. Sitting or lying down,
2. Take off your shoes,
3. Loosen your clothes

Now take deep breaths by breathing in and out in a slow, continue for few minutes to relax.

- Now tense your face muscles. Close your eyes as tight as you can, clench your teeth, if possible move your ears up and make a grimace.

Hold this for a count of eight as you inhale. Now exhale as you relax completely. Let your face go completely lax and feel like you are sleeping. You will feel the tension seep from your facial muscles, enjoy the feeling.

- Now the next step, this time for your neck and shoulders, tense entire your neck and shoulders, again inhaling and counting to eight. Then exhale and relax.

- Continue this towards down your body, repeating the procedure with the following muscle groups: chest, abdomen, entire right arm, right forearm and hand (making a fist), entire left arm, left forearm and hand (again making a fist), buttocks, entire right leg, lower right leg, right foot, entire left leg, lower left leg, and left foot.

For a shortened version, focus on the following four main muscle groups: 1) face; 2) neck, shoulders, and arms; 3) abdomen and chest; and 4) the buttocks, legs and feet. Progressive muscle relaxation can be performed at any time to get de-stress quickly.

Diaphragmatic Breathing (Deep Breathing)

Diaphragmatic Breathing (Deep Breathing) is a self-taught technique. Deep breathing very effectively releases tension and clears the mind. It helps in improving both physical and mental wellness. During anxious time we tend to breathe shallowly or even we try to hold our breath. Shallow breathing lowers down the oxygen intake to our body. This limited oxygen supply to our body adds stress to our body. Many a times we are not aware of this but breathing exercises helps us to reduce this stress.


The key to diaphragmatic breathing (Deep breathing) is to breathe deeply from your abdomen and inhaling as much air as possible into your lungs. As compared to shallow breaths, which we take from our upper chest, than deep breaths from the abdomen the oxygen input into our body is more. More oxygen will provide short of breath, reduces stress, lessen the tense and anxious feeling.

This type of breathing is called diaphragmatic breathing because you are using your Diaphragm to breath. It also means to breathe from the depths of your belly not from your chest and nose.

Good posture while sitting is also an important factor which reduces diaphragmatic breathing. During long hour sitting we tend to slouch on the chair. This compresses the diaphragm and also other organs. It results into shallow breathing.

The neck and back muscles strains due to slouching. Chair with good back support is always recommended to avoid fatigue which leads to slouching.

There are many ways to practice diaphragmatic breathing. Lets have few example of a deep breathing exercise:

-  Sit straight and be comfortable while putting one hand on stomach and other on the chest. Inhale using your nose. During the inhale process try to rise the hand on stomach and keeping the hand on the chest still. Exhale by using your mouth, push out as much air as you can. During the exhale process hand on the stomach should move in. This exhale process should be contracting your abdominal muscles. The hand on the chest should move a little. Now continue to breathing by using your nose. The inhale and exhale process should be such that it rises and fall the abdomen. Slowly count while you exhale. If in the sitting posture, you feel uncomfortable to do this process of Diaphragmatic breathing uneasy you can perform the process by lying down on the floor.

- While sitting comfortably on your seat. Close your eyes and take few deep breath. Keeping your eyes close put your hands in a comfortable position. It depends on your choice of any comfortable hand position like putting one hand on your chest and other on your belly, placing your hands on the knees. Now practice diaphragmatic breathing.



CHAPTER 8: Eating Well Balanced & Healthy Diet

Calmness of mind is one of the beautiful jewels of wisdom

A well balanced diet contains food from the five main groups, which are proteins, vegetables, fruits, dairy and grains. Choose from each of the group all through the day, though it may not be possible to include each one in every meal. A balanced diet and an active lifestyle is the best way to tackle heart diseases. It's important to make right choices, when it comes to your lifestyle. Follow these simple steps for a healthy and disease free living:

- Proteins are essential for the cell building processes and repairing, for making enzymes and hormones. Ideally, choose lean protein like substances which includes egg and poultry, lean meat, seafood, nuts and beans. Dairy products though have proteins; they are a very good source of calcium, potassium and vitamins. Ideally, choose low fat dairy products like milk.
- Choose a good (whole) carbohydrate which means complex ones. Avoid processed foods.
- Adequate Vitamin D is required for healthy bones. **Vitamin D** is essential for strong bones, because it helps absorb **calcium** from the diet. **Vitamin D** deficiency causes rickets. People suffering from rickets will have soft bones, underdeveloped growth and in worst cases, skeletal deformities. But increasingly, it has been revealed that Vitamin D deficiency is associated with lot of other health issues.

- Fruits, vegetables, legumes (e.g. lentils and beans), nuts and whole grains (e.g. unprocessed maize, millet, oats, wheat and brown rice).
- At least 400 g (i.e. five portions) of fruit and vegetables per day), excluding potatoes, sweet potatoes, cassava and other starchy roots.
- For additional health benefits, the free sugar intake should be less than 5% of total energy intake for person with healthy body and consuming about 2000 calories per day. Free sugar is the one which is added to food or drinks and also the one which is available in syrups, fruit juices, honey and confectioneries etc.
- Less than 30% of total energy intake from fats should be included. Saturated fats which are found in coconut oil, cheese, ghee, palm oil etc. are preferred over Unsaturated fats which are found in sunflower oil, canola oil, olive oils, soybean oil etc. Trans fats be it industrially produced trans fats which are found in bakery food, fried food, frozen foods, cookies, wafers, biscuits etc. or ruminant trans fats which are found in meat, dairy foods etc. Of the total energy intake, it is recommended that the saturated fats should be reduced to less than 10% and trans-fats should be reduced to less than 1% of total energy intake. Remember, trans-fats are not part of a healthy diet, and should not be made part of your daily diet.
- Iodized Salt should be part of your daily diet. The quantity intake should be less than 5g per day.
- Trans-fats, be it naturally-occurring or artificial as discussed in the earlier paragraph, is not a part of the healthy diet. Naturally occurring trans-fats are produced from milk and meat products. However, the quantity of naturally-occurring trans-fat present in milk and meat products is very low. Artificial trans-fats are produced in industrial processes that uses hydrogen to make the vegetable oils more solid. Trans-fats raises the LDL or the bad cholesterol level in the body and lower the HDL or the good cholesterol level. Trans-

fat consumption enhances the risk of heart strokes and other heart ailments. You may also develop Type-2 diabetes with consumption of trans-fat.

- Always use naturally occurring and un-hydrogenated oils. For e.g. Sunflower oil, olive oil, canola oil, vegetable oil etc.
- Always look for '0g trans-fat' on the label for nutrition facts and beware of any hydrogenated oils in the ingredients list. Soft margarine can replace butter in your diet. Try to get liquid or tub varieties instead of sticks.
- Always beware of the trans-fat, especially try avoiding fried food, bakery, and other eatable prepared using hydrogenated oils.

A healthy life is a result of nutritious food, combined with physical activity. Keep check on your Body Mass Index (BMI), which will help in reducing the risk of chronic diseases and promote your well-being.

CHAPTER 9: Health Requirements for the Aviation Professionals: Regulatory Requirement

The more tranquil a man becomes, the greater is his success, his influence, his power for good

Aviation is a safety critical profession. By maintaining good health of the aviation personnel, the safety of aviation can be ensured. Any health issues with the aviation professionals can be a risk factor for aviation safety. Occupational stress, which can severely impact the health and thus performance of the people, is one of the potential aviation hazard. If the medical condition or the health of the personnel is so important for the safe aviation, the role of regulators is vital. On the basis of ICAO Standards (Manual of Civil Aviation Medicine. Doc 8984)⁽⁸⁾, the states frame regulations for verifications of medical standards of flight crew, ATCOs and Cabin Crew. The periodic medical examination is conducted by doctors who are trained in aviation medicine and designated by state. The medical examinations have stringent requirements and are termed as Class I, II and III examinations, any deviations from these stipulated norms can get the flight or cabin crew grounded and ATCO off channel.

Following are the regulations as mandated by Indian regulator DGCA.

- a) Rule 39B of the Aircraft Rules, 1937 regarding Medical Standards of flight crew stipulates that no license or rating required for any of the personnel of the aircraft shall be issued or renewed unless the applicant undergoes a medical examination with an approved medical authority and satisfies the medical standards as notified by the Director General⁽⁹⁾. The

flight crew is also required to undergo periodic medical check-ups every 6/12/24 months depending on the age, type of license as per the stipulated regulations of the state.

- b) Rule 103 of the Aircraft Rules, 1937 which deals with Medical standards of Air Traffic Controller (ATCO) stipulates that no license or rating for any of the Air Traffic Controller shall be issued or renewed unless the applicant holds a medical assessment issued by the Director General. The ATCO is also required to undergo a periodic medical check-up, every 12/24 months, depending on the age as per the stipulated regulations of the state.
- c) The Rule 38B of the Aircraft Rules, 1937 deals with carriage of cabin crew. The sub-clause (d) of clause (3) of this rule provides that the operator shall ensure that each cabin crew member remains medically fit to discharge the duties specified in the Operations Manual.

Two basic principles are essential when assessing an applicant's medical fitness for aviation duties namely:

- (a) The applicant should be physically and mentally capable of performing the duties of the license or rating applied for or held.
- (b) There should be no medical reasons, which make the applicant liable to incapacitation while performing duties; to a degree that flight safety might be jeopardized.

The above rule position emphasizes the importance of keeping good health for the aviation personnel. Most of the personnel become conscious of the health issues when they face temporary unfitness. Usually by then, most of the damage has already occurred. Therefore, it is important to start early adapt the SkyFit way of keeping yourself healthy by making small changes in your daily routine and keeping occupational stress at bay.

CHAPTER 10: Total Health

The greatest weapon against stress is our ability
to choose one thought over another.

It is far better to take things as they come along with
patience and equanimity.

All through the life we all strive for two things only - **health and happiness**. No other thing, be it money, be it relationships, or be it success in the external world can replace them. According to the WHO 'health is a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity'. Modern day medical science has been trying to find the physical causes of all the ailments and this has resulted in its failure in understanding and treating the diseases. We have to look beyond the body for the answers. This is where the ancient yoga science has scored. We have to have a right balance of modern medical and ancient yogic sciences. Initially the health definition used to concentrate on the integrity of anatomical, physiological, psychological and social aspects. The emphasis used to be on the absence of disease only. Now the prevention and treatment have been placed on the equal footing.

Total health - it encompasses the all dimensions of the human life -physical, mental, social and spiritual being. Each one of us have the inner potential to be completely healthy and happy. We have to assume responsibility of our own health and make lifestyle choices that will enhance the quality of our overall health. According to the yogic concept it is the imbalance of the prana flow that leads to diseases. It is at the level of the mind the imbalance starts and gets amplified (aadhis). But at this stage there are no manifestations. At the same time

prompted by the faulty lifestyle (desires) these mental diseases, hidden in most of us, starts to manifest externally. This is further aggravated by the wrong actions performed - unhealthy habits, negative thoughts etc. This leads to physical diseases (*vyadhis*). Because of this the mind gets further agitated and this disturbance of the mind causes disruptions in the breath leading to haphazard movement of pranas. Because of this the various body systems including nervous system, which controls all the body systems (including immune system and digestive systems) start malfunctioning. These disturbances settle down in the mind body complex as psychosomatic disorders. This percolates into the physical body and presents as the external body manifestation. We have to follow discipline at various level to be able to reap the benefits of the total health.

The most important aspect of the total health is prevention, the other being treatment. Yoga plays the most important role in this aspect. Modern science is still more focused on the replacement/treatment part. We have to learn and cultivate those aspects which take care of the health. For total health we usually depend more on the external support than the internal sources. Inner contentment and mental health are the real keys of overall well-being. Time has come for us to realize we are not just physical beings, but we are mental as well as breath beings.

The latest belief is that we are self-sufficient to take care of the health (physical, mental, social and spiritual aspects) and that we have been bestowed with this ability at birth. The most important of this is breath. Just by taking care of the breath we can look after all the aspects of the health. Breath is the bridge connecting the physical and mental aspects. And this aspect was fully explored by the yogis /masters of eastern philosophy. Breath is the vehicle for the *prana* in yogic traditions. By consciously cultivating all the aspects of breath one can achieve freedom from pain, miseries, stress and various other modern day diseases.

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SKYFIT

This Book gives an insight to the reader on how to address occupational stress of aviation personnel, be it air traffic controllers, pilots, cabin crew etc. The unprecedented growth in aviation has posed severe threat to the safety of aviation, in terms of the pressure created by capacity vs demand, on the existing infrastructure and resources. The worst hit of all is the human resource. The occupational stress due to cognitive work load of the personnel, especially in aviation can be a challenge for the safe aviation. Long term exposure to the stress is posing severe health issues like hypertension, ischaemic heart disease, diabetes, peptic ulcers and psychoneurotic disorders for the people employed in aviation. Various measures have been discussed in past like improving job planning and reliability of the work systems, improving the work environment, reduction of working hours etc. Airports Authority of India (AAI) has developed simple breathing exercises, in coordination with experts who have practiced these ancient techniques from yogic traditions, for decades and have found encouraging results in managing the stress of the aviation personnel, by just improving the way we breath.

Airports Authority of India has shared these unique and effective techniques, through its programme SKYFIT, with the aviation world, to cope up with the challenges of managing stress of pilots, cabin crew, air traffic controllers and above all air passengers.

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