

The progression of yin deficiency syndromes in flight crews exposed to dry cabin air for prolonged periods

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Introduction:

The two major pillars of Chinese medicine are the concepts of yin and yang. The lack of yin fluids can cascade into pathological patterns of disharmony which are defined as yin deficiency.

This study reflects my personal observations over 12 years of clinical practice (80% of my patients are flight crew members) and was initiated to identify the patterns generated by Yin fluid deficiencies as a function of Flight Crew years of flying, through analyzing the prevalence of self-reported illnesses and symptoms among pilots and flight attendants of commercial jet aircraft.

As a descriptive, self-reported survey which was not based on the results of physical examinations of the personnel in the sample, it was not totally randomized or controlled and did not include or address any control variances such as the overall health of the persons surveyed.

The limitations of this survey approach are acknowledged. Admittedly, apart from dry cabin air there are other significant factors (such as aging, diet, the disruption of circadian rhythms, exposure to pathogens in a confined space, long shifts and the inability to leave at will) which are involved in studying ailments experienced by the members of any workgroup over several years. I recognize and acknowledge that occupational factors like jet lag, as well as normal aging, poor diet and the other factors mentioned all impact the exacerbation of yin deficiency syndromes.

The aim of this investigation is not to compare and contrast pathological symptoms of other populations, but to determine the norms among flight crews in order to develop better treatments.

I am continuing the distribution of questionnaires and collection of responses, and expect to do so for several more years. As the amount of data increases, the study will become more reliable as a predictor of the pathological syndromes to which flight crews are susceptible.

Background:

In recent years, considerable concern has been generated over the potential health effects of the aircraft cabin environment. **(See a list of studies of Aircraft Cabin Air Quality on pages 31 to 33).**

Whelan, Lawson et al (2003), report in *Prevalence of respiratory symptoms among female flight attendants and teachers*, *Journal of Occupational and Environmental Medicine* 2003; 60: 929-934. **“Overall, FAs and schoolteachers report a higher prevalence of work related upper respiratory symptoms, chest illness, and cold or flu than the general working population.”**

My clinical experience with treating Flight Crews for more than 12 years has shown:

- A significant number suffer from dryness symptoms (dry skin 51%, dry eyes 37% and dry mouth 27%).
- The implications of consuming insufficient water and inadequate essential fatty acids (EFAs) are significant.
- The impact of not drinking enough water and not supplementing the body with EFAs for several years can be quite debilitating.
- When flight crews drink at least 4oz. of water per hour during flight (instead of diet soda and coffee) and take appropriate supplements of EFAs, there is a remission of dry skin, dry eyes and dry mouth symptoms by at least 50% within four weeks.

Prolonged exposure by Flight Crews to a pressurized cabin with very low humidity can cause acceleration in the evaporation of water from the:

- Skin
- Lungs
- Nasal passages and throat.

According to Nagda & Hodgson (2001), in *Low relative humidity and aircraft cabin air quality* -

“The studies with more powerful experimental designs have demonstrated the effects of low humidity, such as drying of the skin and mucus membranes, and that a modest increase in relative humidity seems to alleviate a great number of symptoms.”

The effects of exposure to this dry environment over many years can lead to the dehydration of other yin body fluids. The lack of yin body fluids results in stagnation and the disruption of qi and blood to other organs, causing disharmony in a variety of pathological patterns.

Clinical manifestations of Yin Deficiency Syndromes

Yin deficiency	Yin deficiency with Empty-Heat	Collapse of Yin	Turbid Yin not descending	Qi and Yin both deficient	Qi and Blood both deficient	Yin and Yang both deficient
Dry mouth Dry throat at night	Dry mouth Dry throat at night	Dry mouth		Dry mouth Dry throat Dry cough Dry eyes		
Tiredness Dizziness Tinnitus Thin body Insomnia	Tiredness Dizziness Tinnitus Thin body Insomnia		Lethargy	Tiredness	Tiredness Dizziness Palpitations Blurred vision	Tiredness Dizziness Tinnitus Thin body Depression Palpitations Blurred vision
Night sweating	Night sweating	Abundant perspiration		Spontaneous sweating	Spontaneous sweating	Sweating and a feeling of heat on slight exertion
	Five-palm heat Heat in the evening	Skin hot to the touch Hot limbs		Heat in the afternoon Shortness of breath	Shortness of breath	Shortness of breath
			Poor appetite	Poor appetite Dislike of speaking	Poor appetite Dislike of speaking	Dislike of speaking
	Scanty dark urine	Retention of urine	Oedema of the ankles Scanty urine Retention of urine	Weak muscles Weak voice	Weak muscles Weak voice	Cold limbs A feeling of cold
	Dark stools	Constipation	Constipation or Loose stools A feeling of heaviness of the body A feeling of distension and oppression of the epigastrium	Loose stools	Loose stools Dull-pale complexion Numbness / tingling of limbs Scanty periods Late periods Heavy periods	

Materials/Methods:

In a self-selected convenience sample, surveys were conducted among pilots ($N=56$) and flight attendants ($N=265$) of commercial jet aircraft on an opt-in basis between June 2007 and January 2009. 205 of the respondents (64%) were female.

- Questionnaires focused on Flight Crew health concerns were developed and posted on the Internet in June 2007, and data collection began immediately. Signs encouraging Pilots and Flight Attendants to complete the online questionnaires were placed in strategic areas of the Sherry Frontenac Hotel in Miami Beach, Florida.

“The Sherry” is known in the airline industry as a “layover” hotel, and it accommodates about 22 crews (approximately 5 to 14 persons per crew) at a time. It is exclusively for flight crews, and is known by airline personnel around the world. At any given time, the crews are about evenly divided between domestic and international airlines, flying both short and long hauls.

- Online access to the questionnaires was provided through two websites - PilotHealthSurvey.com and FlightAttendantHealthSurvey.com.
- Printed copies of the questionnaires were placed on a display table in the hotel close to where Flight Crew members staying at “The Sherry” are required to collect or return towels on their way to or from the swimming pool. The written responses from those who elected to participate were then entered into the online surveys.
- From time to time, the table was manned by someone who explained the objectives of the study to all flight personnel who passed by. They were handed questionnaires and asked to contribute to the study.
- All data from responses received in the surveys was collated and analyzed to determine patterns of disharmony.
- The prevalence of work-related eye, nose, and throat symptoms, sleep disorders, joint pain, temperature sensitivity, digestive disorders and fungal infections was quantified by the career years in which they were experienced.

Sample of Questionnaire



CONFIDENTIAL

Flight Attendant Health Survey ★ indicates a required answer

1) What is your current marital status?

☐ Single ☐ Single, Never Married ☐ Married ☐ Divorced ☐ Widowed

2) What is your age? ★

3) Have you ever been injured on an airplane? (Check all that apply) ★

Never Head Neck Shoulder Arm Elbow Hand Knee Foot Lower Back Upper Back

Injuries ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐

4) How many years have you been flying as a Flight Attendant? ★

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 to 25 More than 25

Years ☐

5) Have you ever had any of the following ailments? ★

If so, please indicate if the condition was pre-existent or how many years you had been flying before your symptoms began.

	Never	Pre-flying	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21 to 25	Over 25
High Cholesterol	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Dry Skin	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Dry Eyes	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Waking with Dry Mouth	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

6) Have you ever had any of the following ailments? ★

If so, please indicate if the condition was pre-existent or how many years you had been flying before your symptoms began.

	Never	Pre-flying	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21 to 25	Over 25
Knees and back feel tight on exertion	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Mid night sweats	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Mid back pain	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Mid knee pain	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Mid acid reflux	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Nail fungus	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Nasal infections	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Yeast infections	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Insomnia	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Constipation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

7) Have you ever had any of the following ailments? ★

If so, please indicate if the condition was pre-existent or how many years you had been flying before your symptoms began.

	Never	Pre-flying	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21 to 25	Over 25
Difficulty falling asleep	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Body feels warm all the time	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Palms and soles of feet feel warmer than the rest of your body	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Difficulty staying warm	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Aversion to cold – chilled easily	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Moderate to severe knee pain	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Moderate to severe back pain	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Moderate to severe hip pain	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Mild depression	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

8) Have you ever had any of the following ailments? ★

If so, please indicate if the condition was pre-existent or how many years you had been flying before your symptoms began.

	Never	Pre-flying	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21 to 25	Over 25
Intense night sweats	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Chronic sinusitis	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Intense nail fungus, nasal infection or yeast infection	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Headache starting at the nape of neck, travelling up then moving around the top of the ear into the eye	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

9) Have you ever had any of the following ailments? ★

If so, please indicate if the condition was pre-existent or how many years you had been flying before your symptoms began.

	Never	Pre-flying	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21 to 25	Over 25
Intense headaches that make your eyes throb	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Irritable bowel	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Acid reflux	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Chronic fatigue	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Fibromyalgia	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Chronic knee pain	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Chronic back pain	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
High Blood Pressure	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

10) Do you still have any of these ailments? ★

	Yes	No
Knees and back tight on exertion	<input type="checkbox"/>	<input type="checkbox"/>
Night sweats	<input type="checkbox"/>	<input type="checkbox"/>
Back pain	<input type="checkbox"/>	<input type="checkbox"/>
Knee pain	<input type="checkbox"/>	<input type="checkbox"/>
Hip pain	<input type="checkbox"/>	<input type="checkbox"/>
Acid reflux	<input type="checkbox"/>	<input type="checkbox"/>
Nail fungus	<input type="checkbox"/>	<input type="checkbox"/>
Nasal infection	<input type="checkbox"/>	<input type="checkbox"/>
Yeast infection	<input type="checkbox"/>	<input type="checkbox"/>
Insomnia	<input type="checkbox"/>	<input type="checkbox"/>
Constipation	<input type="checkbox"/>	<input type="checkbox"/>
High cholesterol	<input type="checkbox"/>	<input type="checkbox"/>
Dry skin	<input type="checkbox"/>	<input type="checkbox"/>
Dry eyes	<input type="checkbox"/>	<input type="checkbox"/>
Waking with dry mouth	<input type="checkbox"/>	<input type="checkbox"/>
Body warm all the time	<input type="checkbox"/>	<input type="checkbox"/>
Palms and soles exceptionally warm	<input type="checkbox"/>	<input type="checkbox"/>
Depression	<input type="checkbox"/>	<input type="checkbox"/>
Sinusitis	<input type="checkbox"/>	<input type="checkbox"/>
Difficulty staying warm	<input type="checkbox"/>	<input type="checkbox"/>
Severe headache	<input type="checkbox"/>	<input type="checkbox"/>
Aversion to cold	<input type="checkbox"/>	<input type="checkbox"/>
Irritable bowel	<input type="checkbox"/>	<input type="checkbox"/>
Chronic fatigue	<input type="checkbox"/>	<input type="checkbox"/>
Fibromyalgia	<input type="checkbox"/>	<input type="checkbox"/>
High blood pressure	<input type="checkbox"/>	<input type="checkbox"/>

11) What is your gender? ★

- ☐ Male (Skip to Question 16)
☐ Female

12) Have you ever had any of the following ailments? ★

If so, please indicate if the condition was pre-existent or how many years you had been flying before your symptoms began.

	Never	Pre-flying	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21 to 25	Over 25
Lighter menstrual flow, less regular, turning bright red	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Difficulty conceiving	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Difficulty carrying pregnancy to term	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Menstrual flow stops for months at a time, may be clotty and painful	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Fibroids	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Endometriosis	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Cysts	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Excessive body heat exacerbated by menopause	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

13) Have you ever had a child?? ★

☐ Yes

☐ No

14) Please indicate each year of your career in which you gave birth.

	Before flying	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	After 25
Career Year	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

15) Do you still have any of the following ailments? ★

	Yes	No
Lighter menstrual flow, less regular, turning bright red	<input type="checkbox"/>	<input type="checkbox"/>
Difficulty conceiving	<input type="checkbox"/>	<input type="checkbox"/>
Difficulty carrying pregnancy to term	<input type="checkbox"/>	<input type="checkbox"/>
Menstrual flow stops for months at a time, may be clotty and painful	<input type="checkbox"/>	<input type="checkbox"/>
Fibroids	<input type="checkbox"/>	<input type="checkbox"/>
Endometriosis	<input type="checkbox"/>	<input type="checkbox"/>
Cysts	<input type="checkbox"/>	<input type="checkbox"/>
Excessive body heat exacerbated by menopause	<input type="checkbox"/>	<input type="checkbox"/>

16) Please add any other conditions not mentioned above.

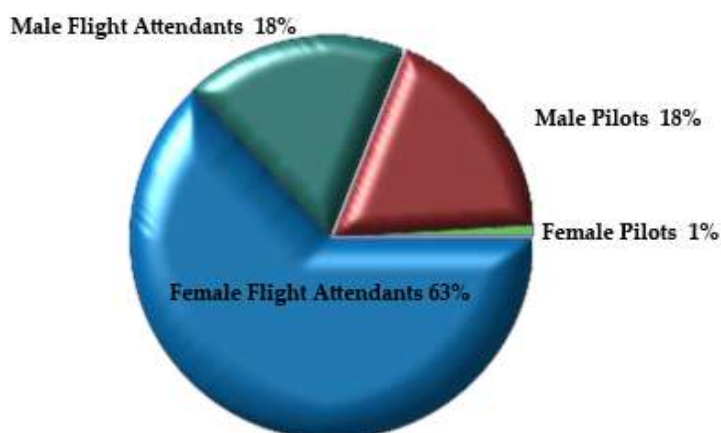
If you would like to receive a copy of our survey results by email, as well as information on Flight Crew Health from time to time, please enter your email address below.

Demographics of Survey Respondents

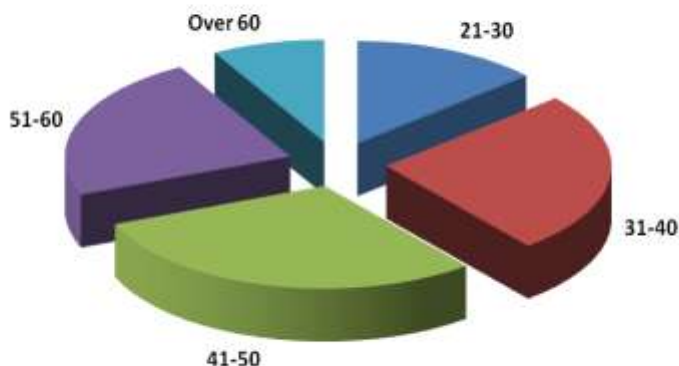
The following pie charts show the gender, occupations and age distributions of the survey sample. 30% of flight crew members surveyed (96) were aged between 41 and 50, 26% (83) between 31 and 40, 23% (74) between 51 and 60, 14% (45) between 21 and 30, and 7% (23) over 60 years.

Except for comparing the prevalence of symptoms in pilots and flight attendants prior to the start of their flying careers, these demographic factors were not considered to be significant to the study and therefore no further analysis was done along these lines.

Gender, Occupation and Ages of Sample Population



Age Distribution



Unless otherwise indicated, all other graphs and charts in this report illustrate the prevalence of symptoms within the entire survey sample ($N=321$), irrespective of age, gender or occupation.

Results:

The survey respondents reported high levels in the onset of sleep disorders and respiratory ailments within their first 5 career years, and showed a rapid progression in the onset of joint pain over the next 20 years, with some increases as high as 350%.

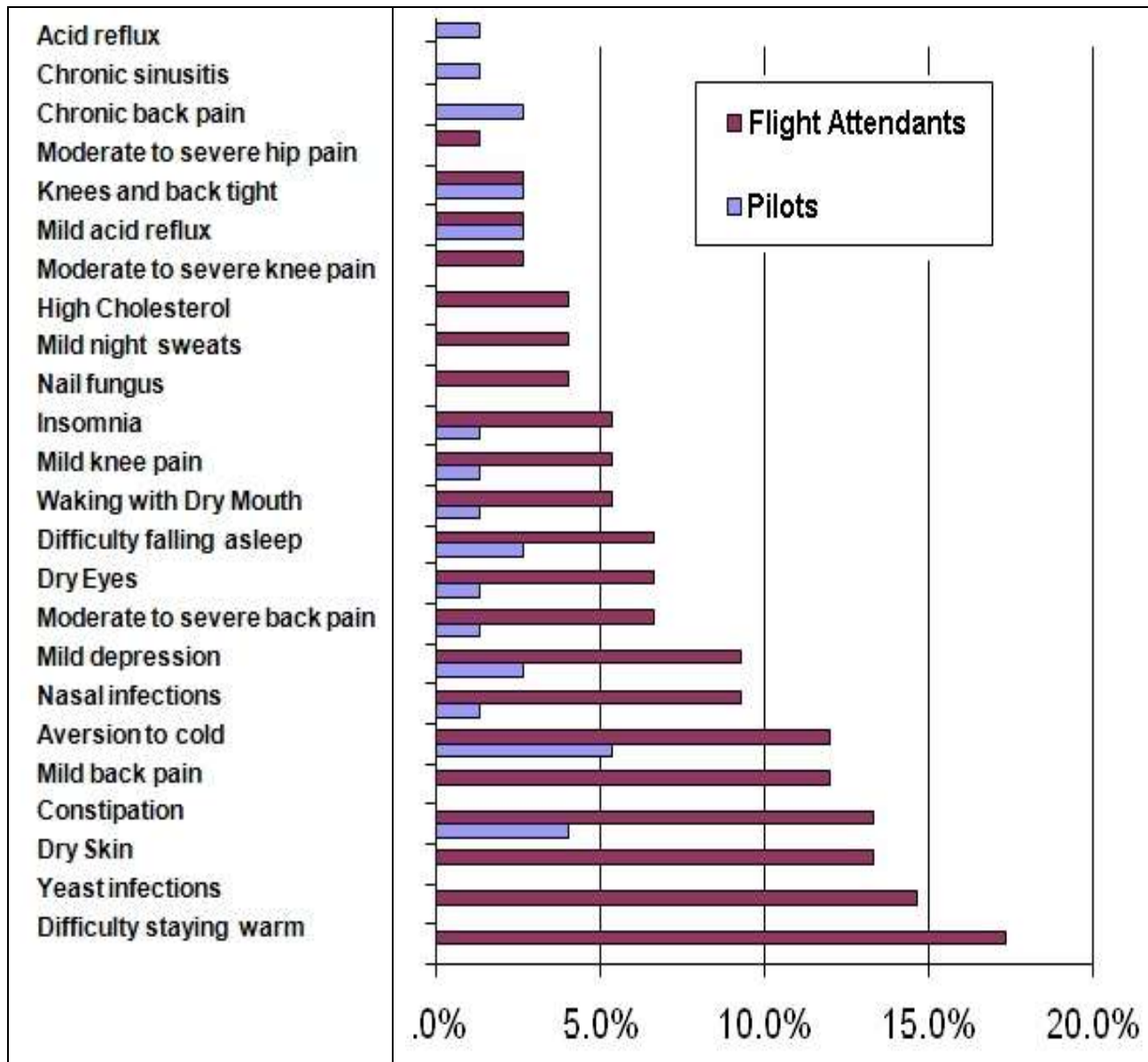
	At Survey Date	In 5 years	In 15 years	In 25 years	
Insomnia	45%	33%	46%	48%	
Difficulty falling asleep		36%	54%	55%	
Fungal Infections	16-25%	15%	25%	27%	
Waking with Dry Mouth	27%	13%	22%	27%	
Dry Eyes	37%	25%	34%	37%	
Dry Skin	51%	33%	45%	49%	
Hip Pain	21%	4%	10%	18%	- 350% increase
Mild knee pain		10%	25%	36%	- 260% increase
Severe Knee Pain		7%	15%	21%	- 200% increase
Back Pain	46%	15%	32%	37%	

It is important to note that all flight crew (especially pilots) must pass a stringent physical examination before being accepted for employment.

It is also important to note that **none of the following symptoms was reported by any of the survey respondents** as occurring **before** they began their flying careers:

- Chronic fatigue
- Chronic knee pain
- Intense night sweats
- Body feeling warm all the time
- Palms and soles of feet feeling warmer than the rest of the body
- Intense nail fungus, nasal infections or yeast infections
- Headaches starting at the nape of the neck
- Intense headaches that make the eyes throb
- High Blood Pressure
- Irritable bowel
- Cysts
- Fibroids
- Endometriosis
- Fibromyalgia
- Difficulty conceiving
- Difficulty carrying pregnancy to term
- Lighter menstrual flow, less regular, turning bright red
- Menstrual flow stops for months at a time
- Excessive body heat exacerbated by menopause

Prevalence of symptoms before start of Flying Careers (all respondents)

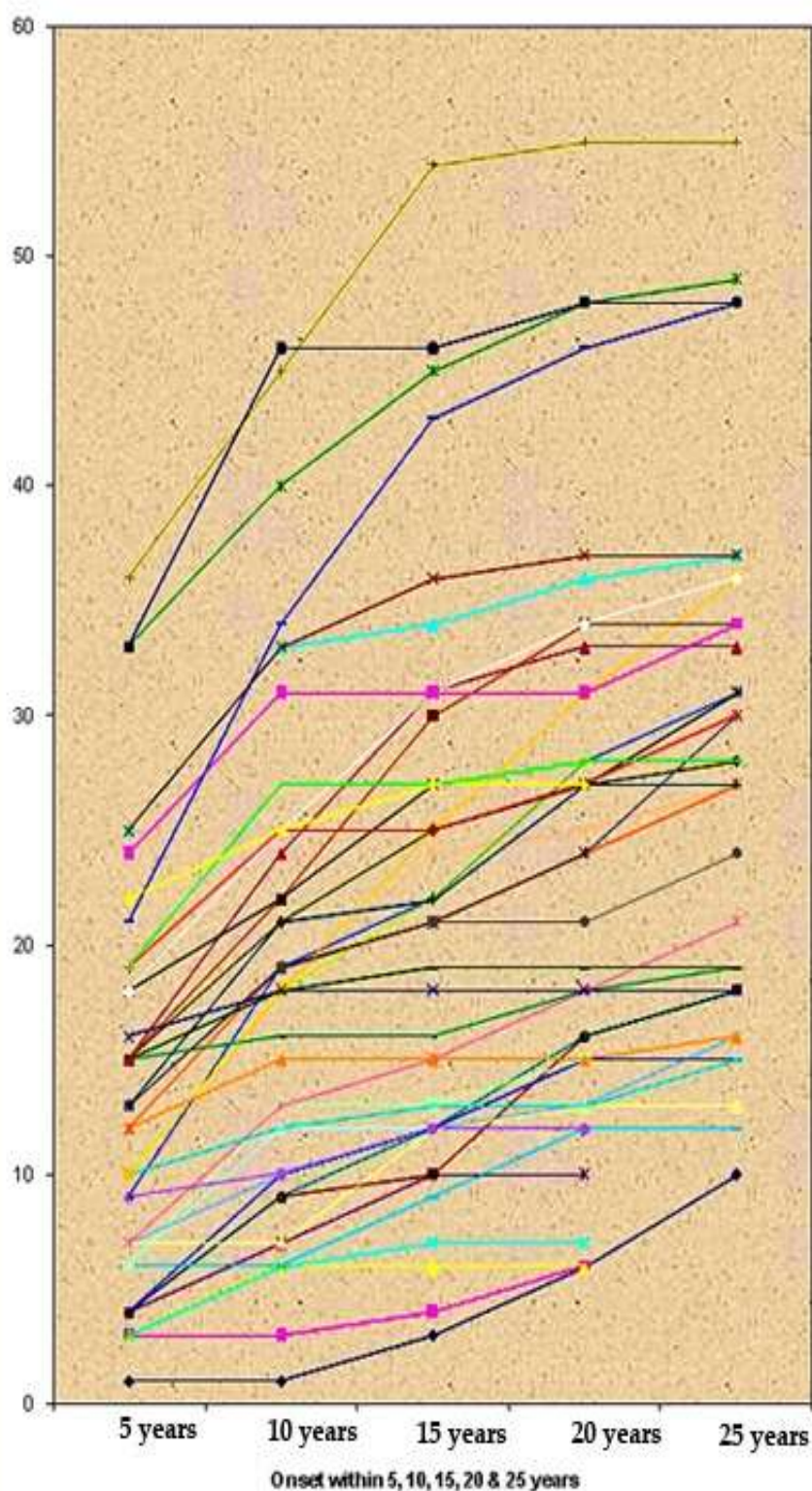


Progression of Onset of Symptoms in Flight Crews (all respondents)

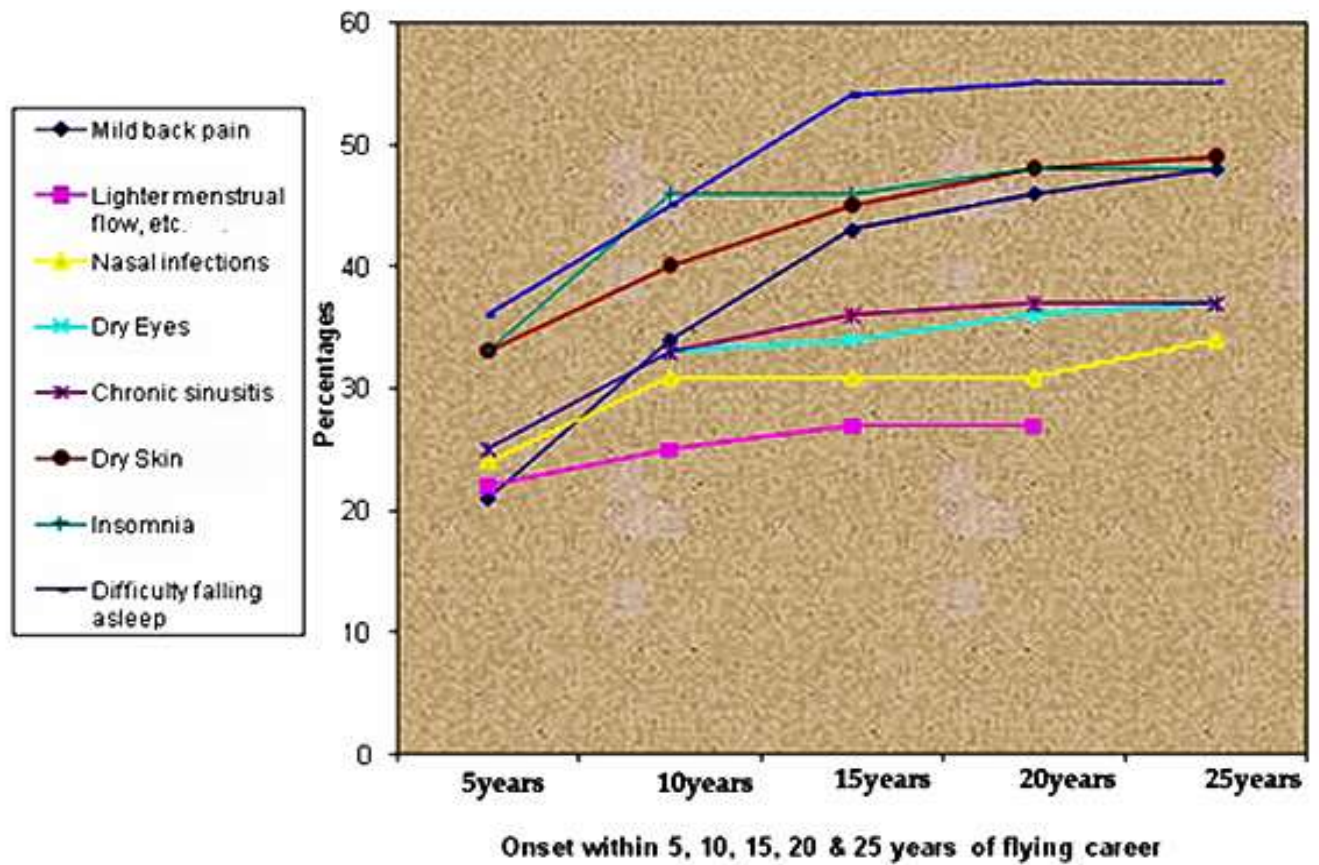
	In 5 yrs	In 10 yrs	In 15 yrs	In 20 yrs	In 25 yrs
Difficulty falling asleep	36%	45%	54%	55%	55%
Insomnia	33%	46%	46%	48%	48%
Dry Eyes	25%	33%	34%	36%	37%
Dry Skin	33%	40%	45%	48%	49%
Waking with Dry Mouth	13%	21%	22%	27%	27%
Mild knee pain	10%	18%	25%	31%	36%
Knees and back tight on exertion	15%	22%	30%	34%	34%
Moderate to severe knee pain	7%	13%	15%	18%	21%
Chronic knee pain	10%	12%	13%	13%	15%
Moderate to severe hip pain	4%	9%	10%	16%	18%
Mild back pain	21%	34%	43%	46%	48%
Moderate to severe back pain	9%	19%	22%	28%	31%
Chronic back pain	15%	24%	31%	33%	33%
Chronic sinusitis	25%	33%	36%	37%	37%
Intense headaches	18%	22%	27%	27%	31%
Throbbing headaches	19%	25%	25%	27%	30%
Nail fungus	7%	7%	12%	13%	13%
Nasal infections	24%	31%	31%	31%	34%
Yeast infections	12%	15%	15%	15%	16%
Intense fungal infections	15%	16%	16%	18%	19%
Mild night sweats	10%	18%	22%	28%	28%
Intense night sweats	4%	10%	12%	15%	15%
Excessive body heat	1%	1%	3%	6%	10%
Aversion to cold -- chilled easily	15%	18%	19%	19%	19%
Body feels warm all the time	4%	9%	12%	16%	18%
Difficulty staying warm	16%	18%	18%	18%	18%
Palms, soles warmer	6%	6%	9%	12%	12%
Mild acid reflux	13%	19%	21%	24%	30%
Acid reflux	12%	19%	21%	24%	27%
Irritable bowel	13%	19%	21%	21%	24%
Constipation	19%	27%	27%	28%	28%
High Blood Pressure	7%	10%	12%	13%	16%
High Cholesterol	9%	18%	24%	25%	27%
Chronic fatigue	15%	21%	25%	28%	28%
Mild depression	18%	25%	31%	34%	36%
Lighter menstrual flow, etc.	22%	25%	27%	27%	
Fibroids	6%	13%	13%	15%	
Cysts	6%	12%	12%	12%	
Menstrual flow stops, etc.	9%	10%	12%	12%	
Difficulty conceiving	4%	7%	10%	10%	
Fibromyalgia	3%	6%	7%	7%	
Difficulty carrying pregnancy to term	3%	3%	4%	6%	
Endometriosis	3%	6%	6%	6%	

- Difficulty falling asleep
- Insomnia
- *— Dry Skin
- *— Chronic sinusitis
- *— Dry Eyes
- *— Nasal infections
- *— Lighter menstrual flow, etc.
- *— Mild back pain
- *— Constipation
- *— Throbbing headaches
- *— Mild depression
- *— Intense headaches
- *— Difficulty staying warm
- *— Chronic back pain
- *— Knees and back tight on exertion
- *— Chronic fatigue
- *— Aversion to cold -- chilled easily
- *— Intense fungal infections
- *— Waking with Dry Mouth
- *— Irritable bowel
- *— Mild acid reflux
- *— Acid reflux
- *— Yeast infections
- *— Mild knee pain
- *— Mild night sweats
- *— Chronic knee pain
- *— Moderate to severe back pain
- *— High Cholesterol
- *— Menstrual flow stops, etc.
- *— Moderate to severe knee pain
- *— High Blood Pressure
- *— Nail fungus
- *— Fibroids
- *— Cysts
- *— Palms, soles warmer
- *— Intense night sweats
- *— Body feels warm all the time
- *— Moderate to severe hip pain
- *— Difficulty conceiving
- *— Fibromyalgia
- *— Endometriosis
- *— Difficulty carrying pregnancy
- *— Excessive body heat

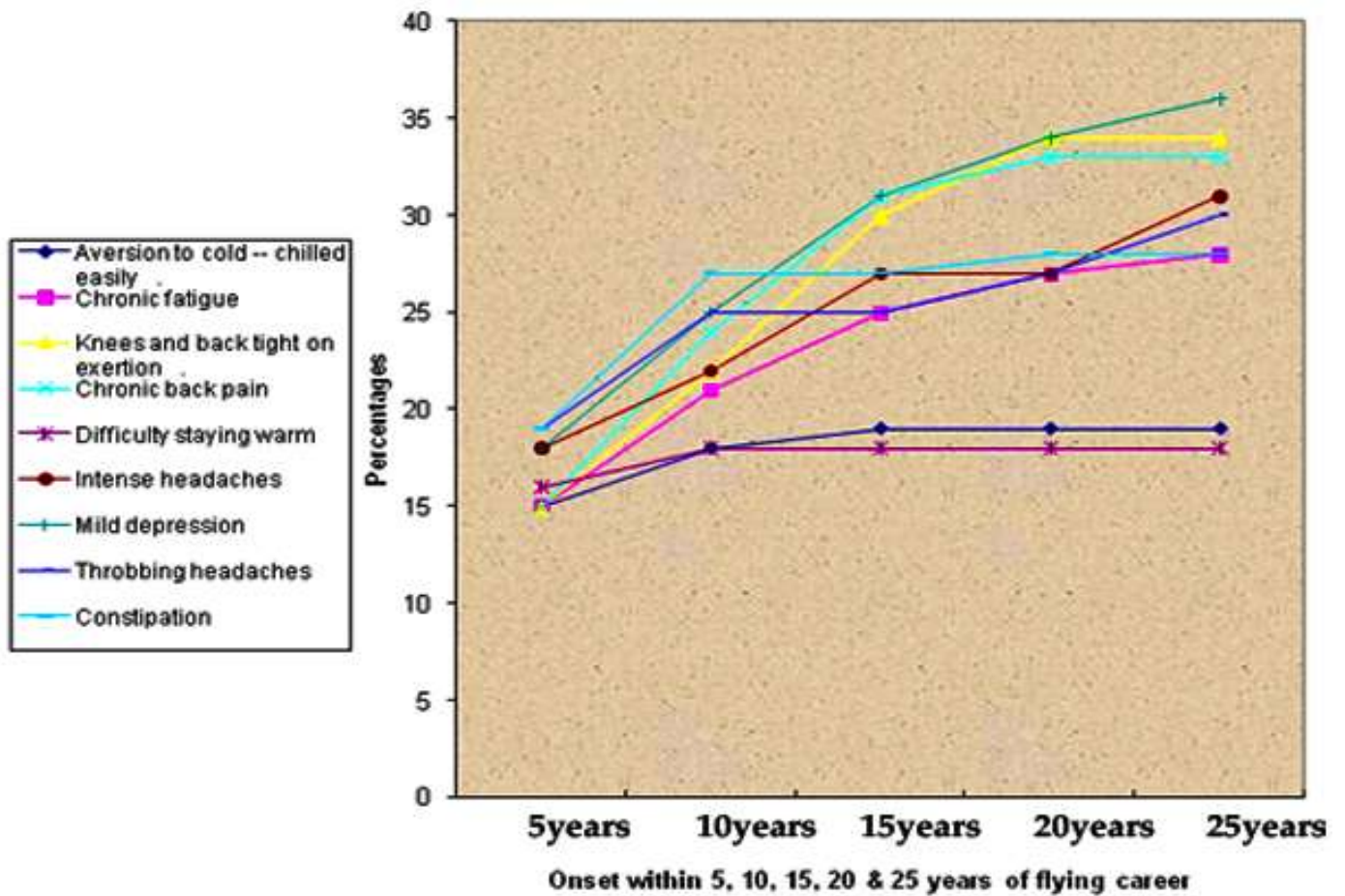
All Symptoms Graphed



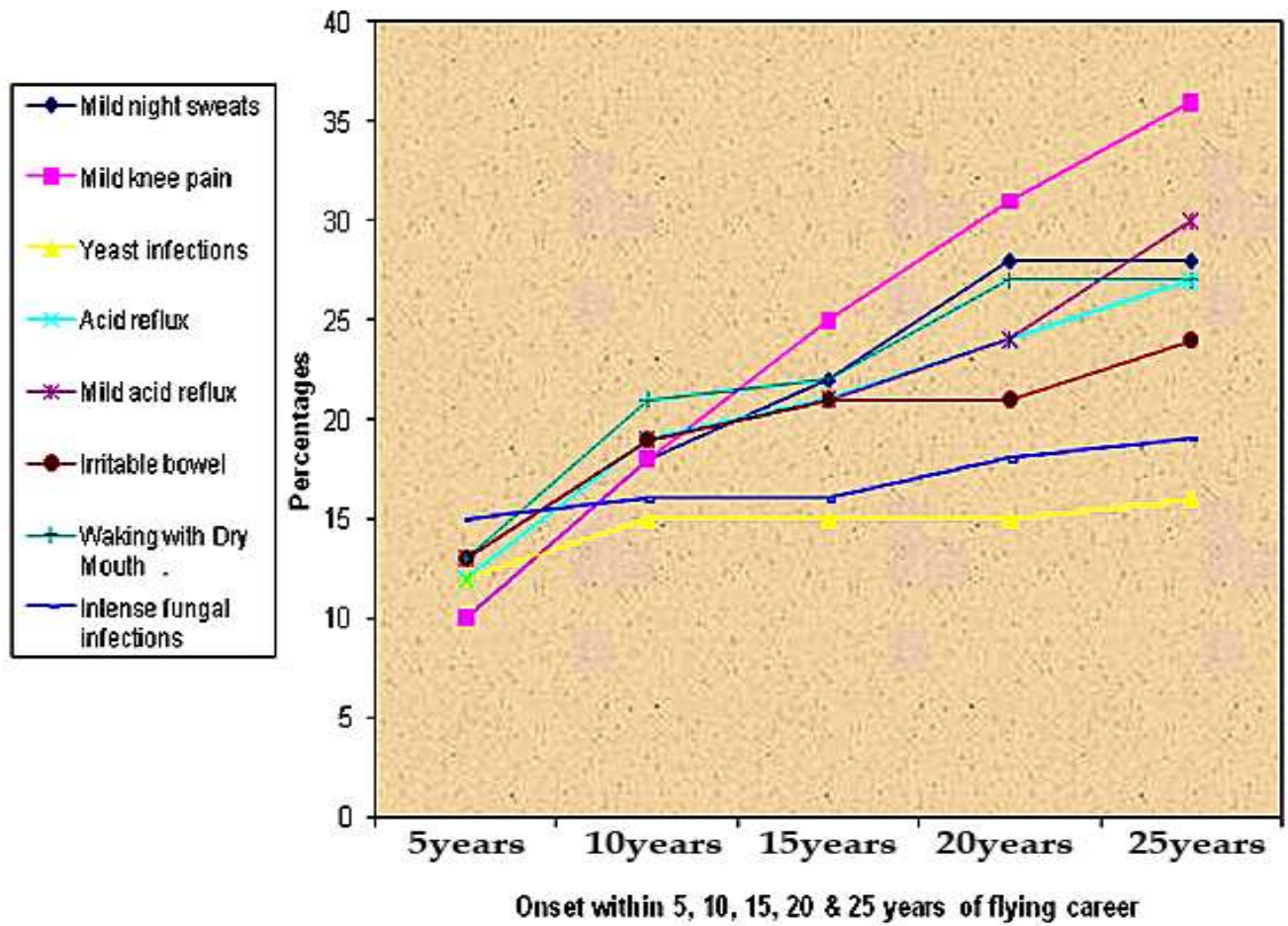
Percentage Clustering of Flight Crew Symptoms



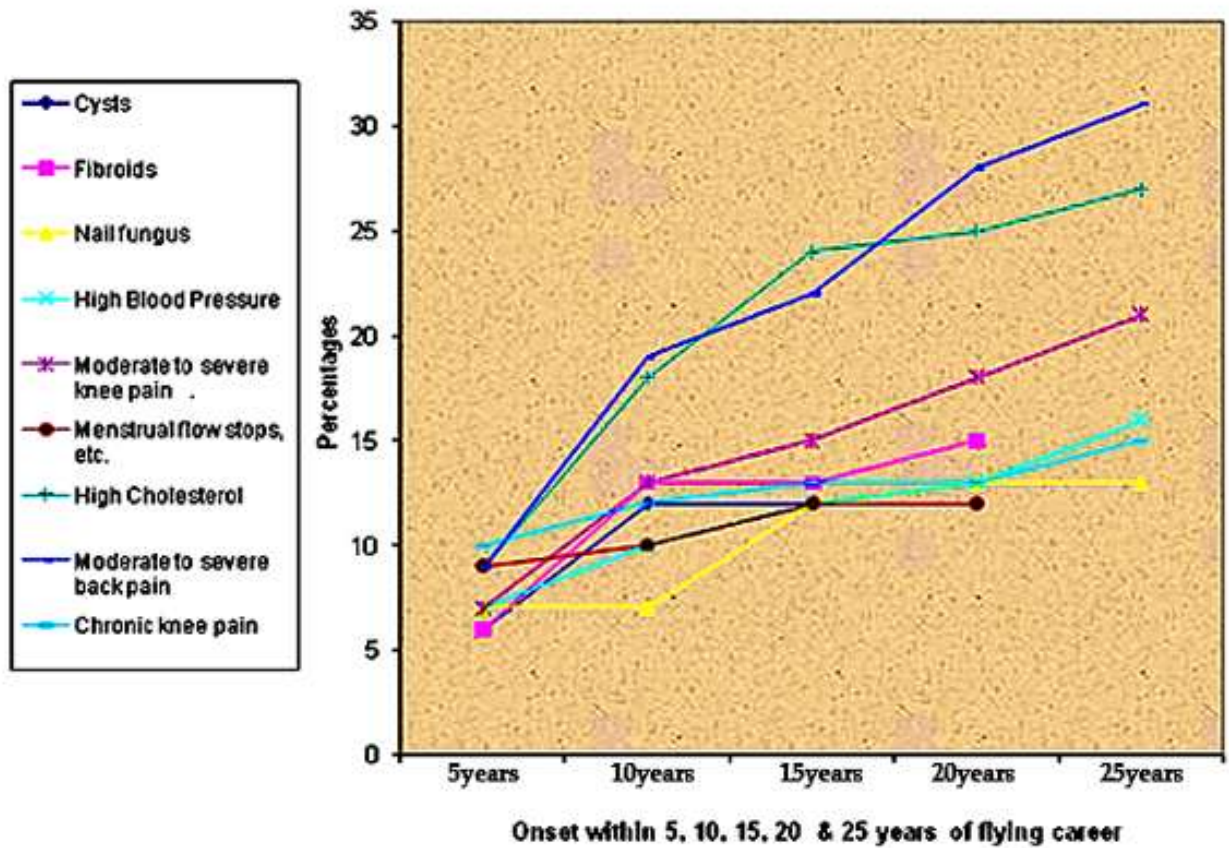
Percentage Clustering of Flight Crew Symptoms



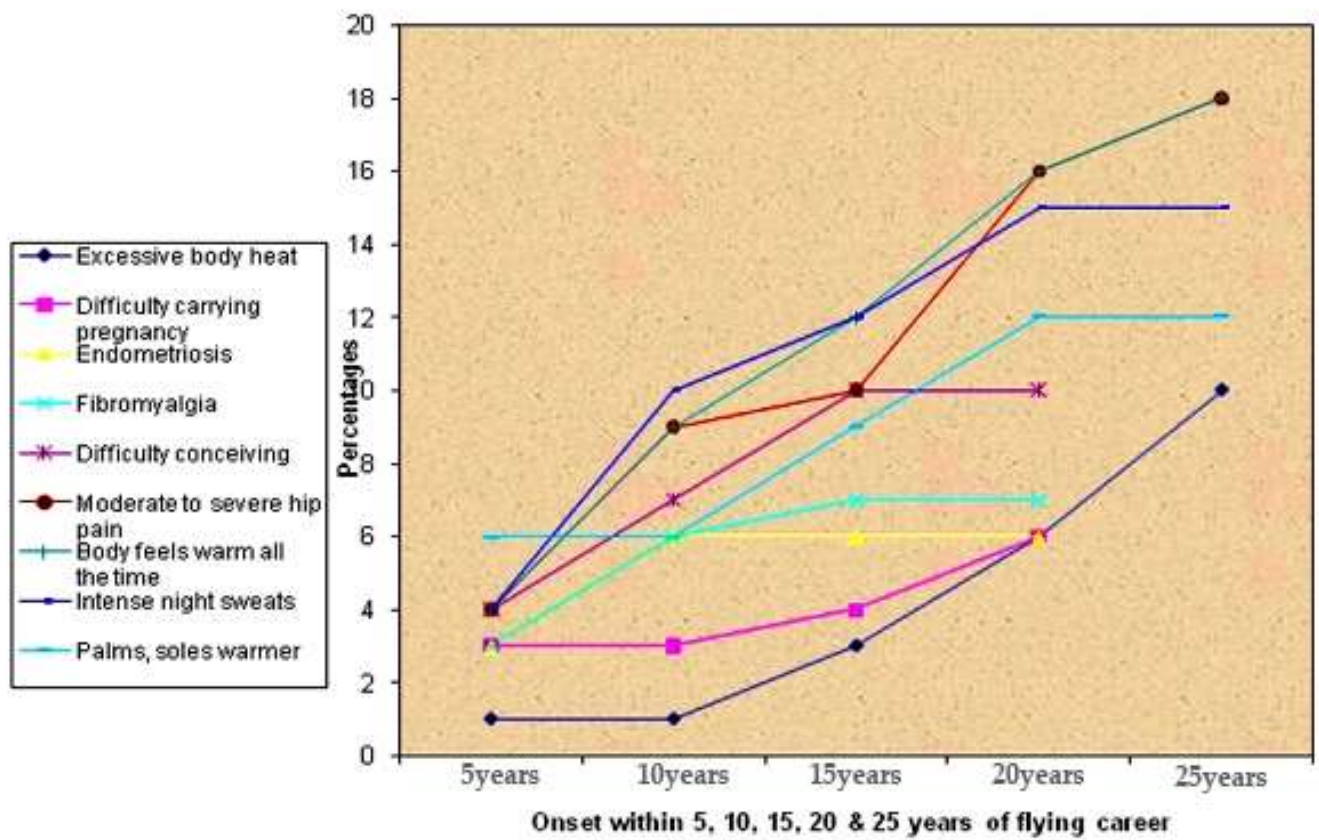
Percentage Clustering of Flight Crew Symptoms



Percentage Clustering of Flight Crew Symptoms

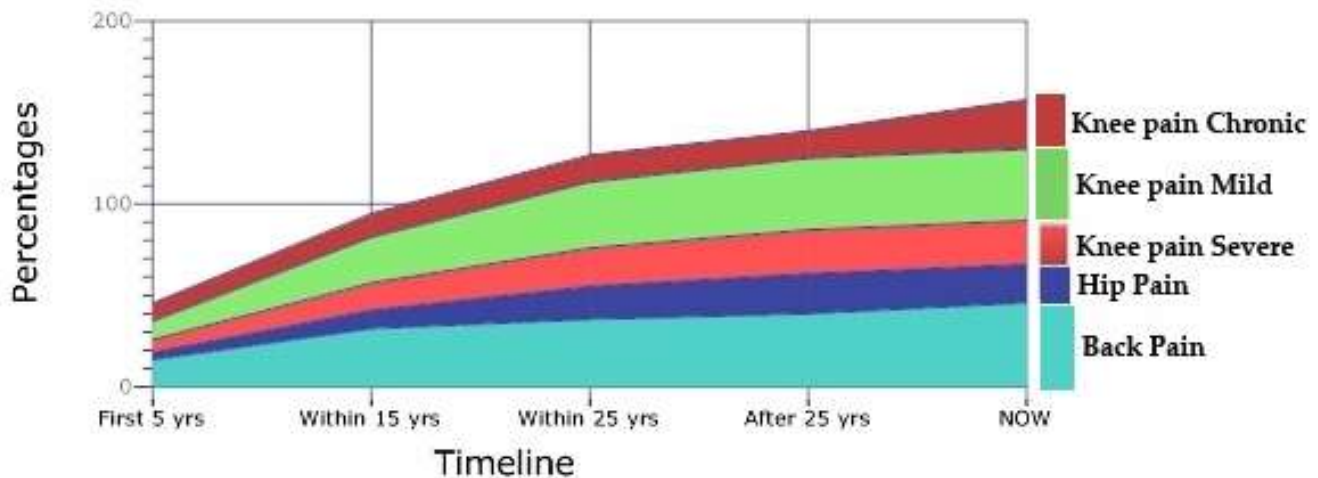


Percentage Clustering of Flight Crew Symptoms

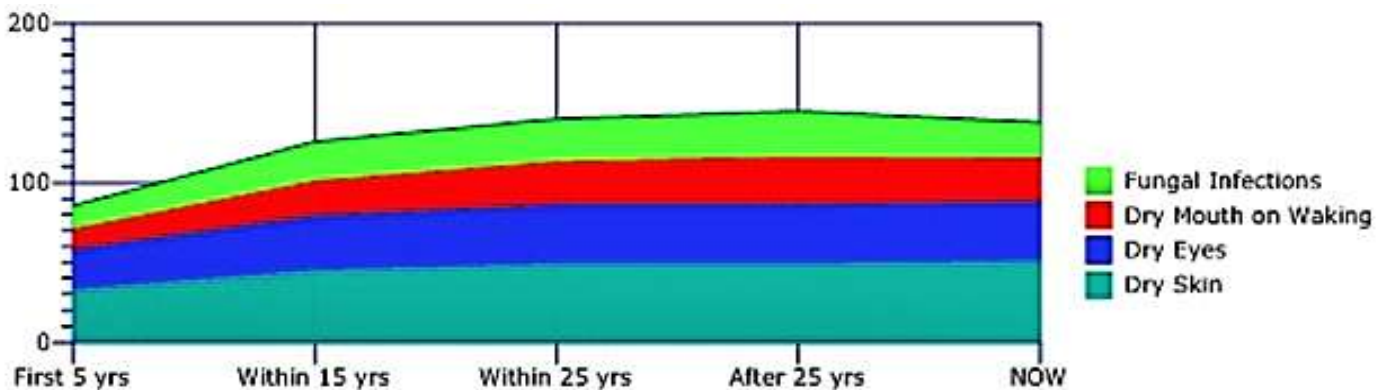


Progression of Symptoms over the course of Flying Careers

These charts illustrate the time and percentage correlations of the onset of the **pain and dryness symptoms** indicated, and compare the percentage of respondents reporting the existence of these symptoms at the survey date. Percentages shown are not cumulative, but are stacked to facilitate comparative analysis.

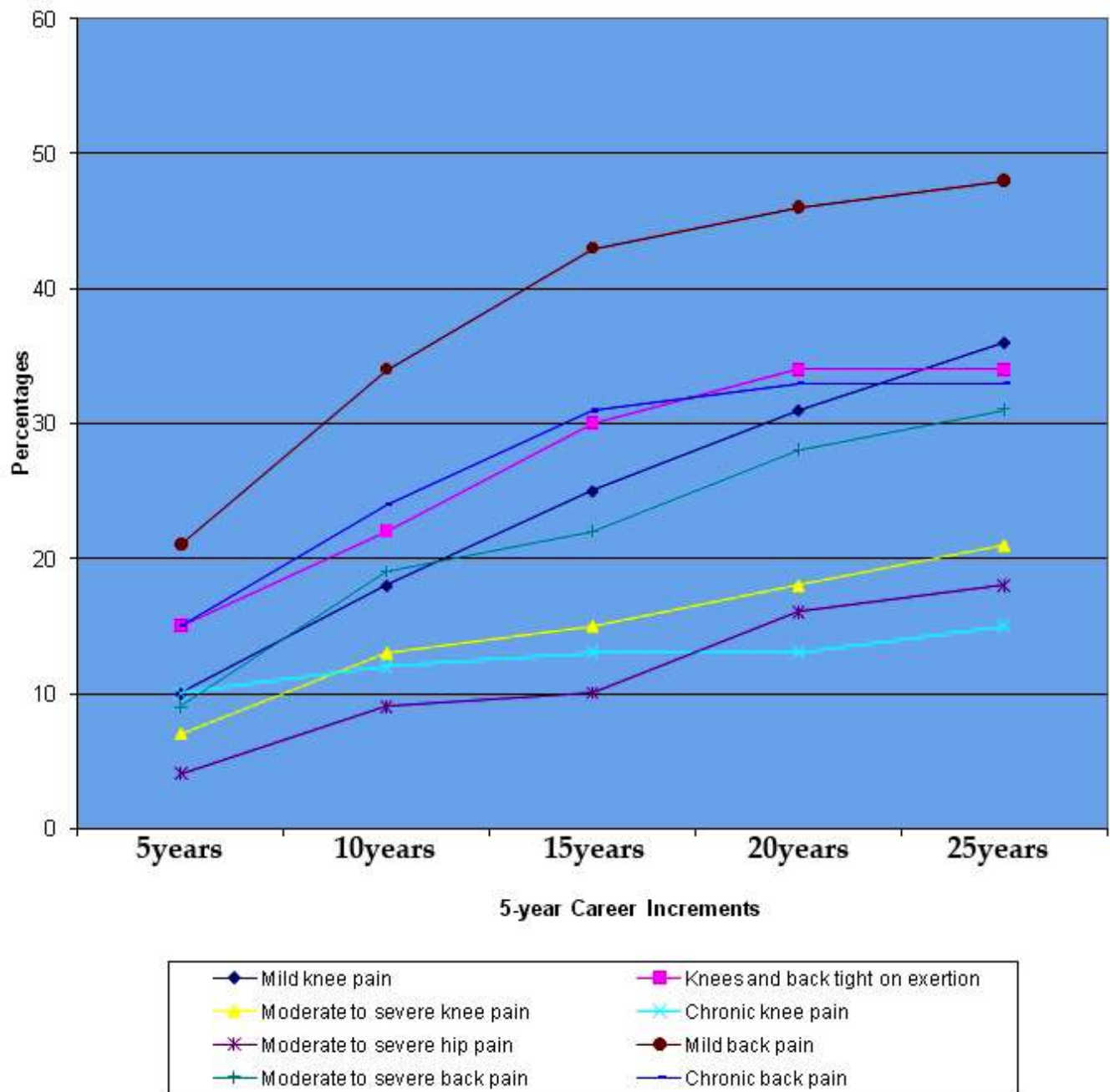


	First 5 yrs	Within 15 yrs	Within 25 yrs	After 25 yrs	NOW
Back Pain	15	32	37	40	46
Hip Pain	4	10	18	22	21
Knee Pain (Severe)	7	15	21	24	24
Knee Pain (Mild)	10	25	36	39	39
Knee Pain (Chronic)	10	13	15	15	27

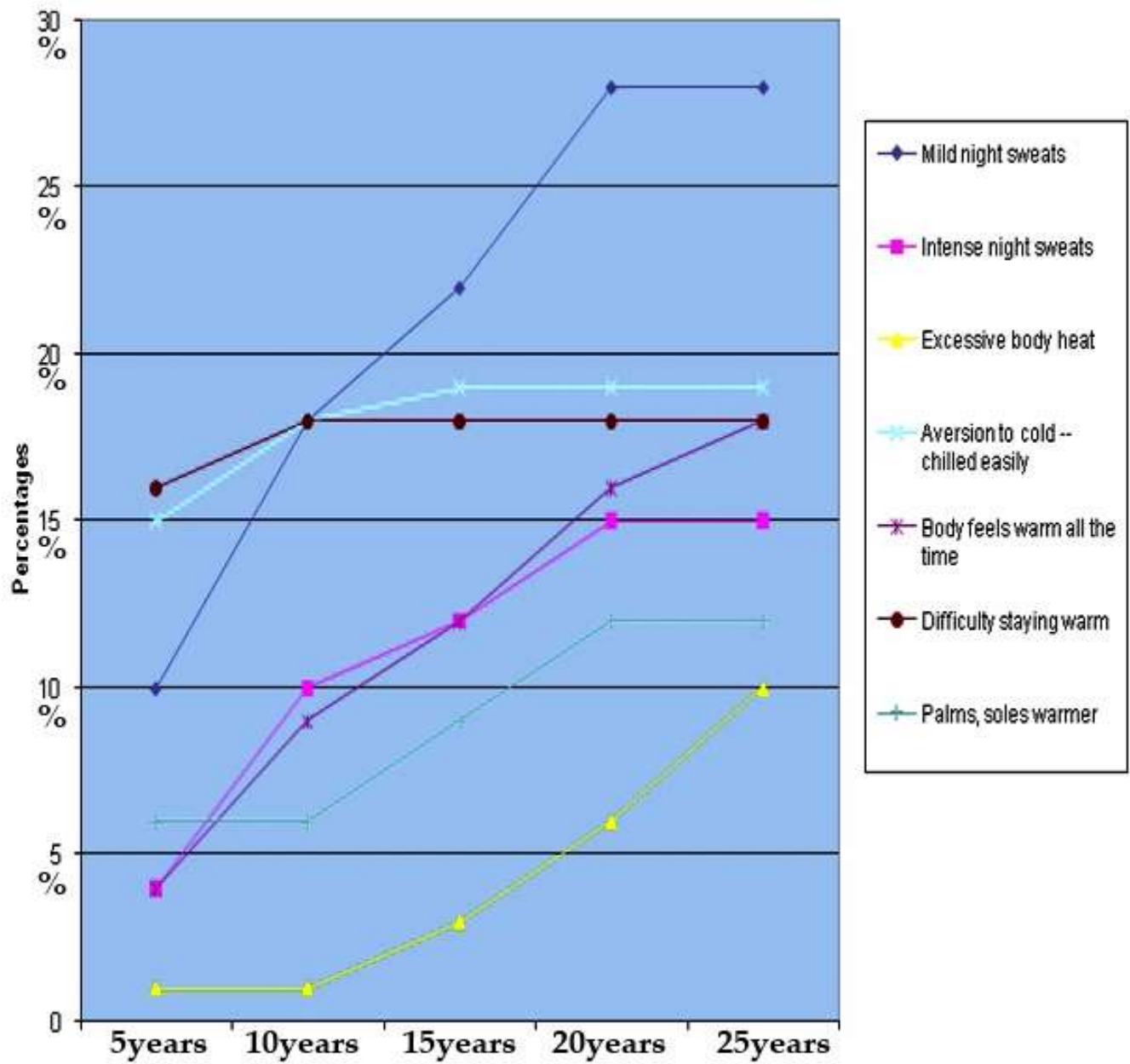


	First 5 yrs	Within 15 yrs	Within 25 yrs	After 25 yrs	NOW
Dry Skin	33	45	49	49	51
Dry Eyes	25	34	37	37	37
Dry Mouth on Waking	13	22	27	30	27
Fungal Infections	15	25	27	29	23

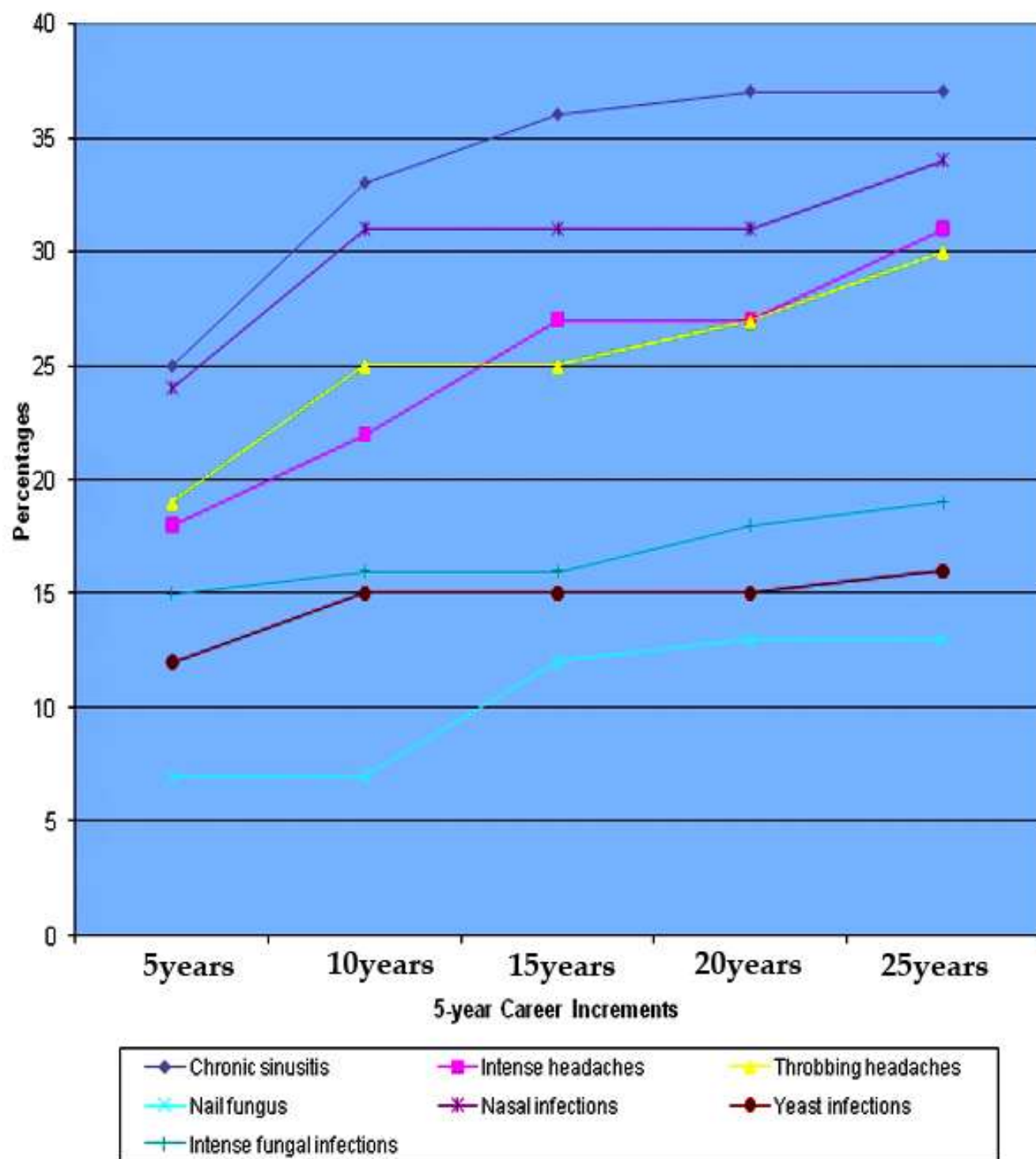
PAIN



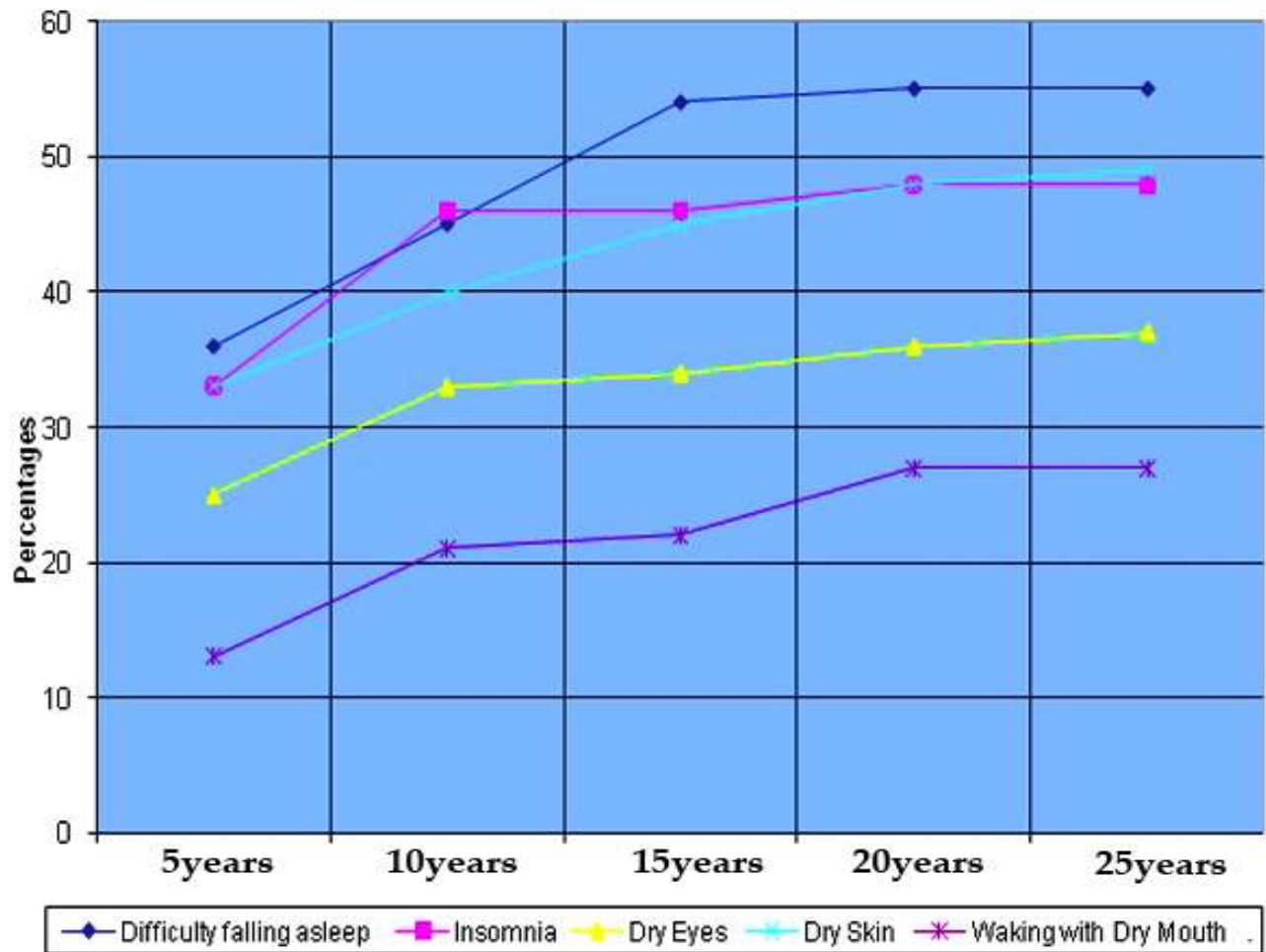
TEMPERATURE SENSITIVITY



ONSET of RESPIRATORY and FUNGAL AILMENTS



DRYNESS and SLEEP DISORDERS



Conclusions

The manifestation of Yin deficiency patterns increases exponentially in terms of the percentage of flight crew members afflicted over time:

	Within 5 yrs	Within 15 yrs	Within 25 yrs	Final Impact Ratio
Insomnia	33%	46%	48%	145%
Difficulty falling asleep	36%	54%	55%	152%
Hip Pain	4%	10%	18%	450%
Mild Knee Pain	10%	25%	36%	360%
Severe Knee Pain	7%	15%	21%	300%
Back Pain	15%	32%	37%	246%
Fungal Infections	15%	25%	27%	180%
Waking with Dry Mouth	13%	22%	27%	200%
Dry Eyes	25%	34%	37%	148%
Dry Skin	33%	45%	49%	148%

Within the first five years of their careers, the skin, sinus membrane, lungs, mouth and throat of cabin crew begin to show significant stress:

- The sinus cavity becomes more susceptible to bacteria and fungal infections – 48%.
- Lungs reveal exacerbation of symptoms when exposed to flu.

Whelan, Lawson et al (2003), report in *Prevalence of respiratory symptoms among female flight attendants and teachers*, *Journal of Occupational and Environmental Medicine* 2003; 60: 929-934.

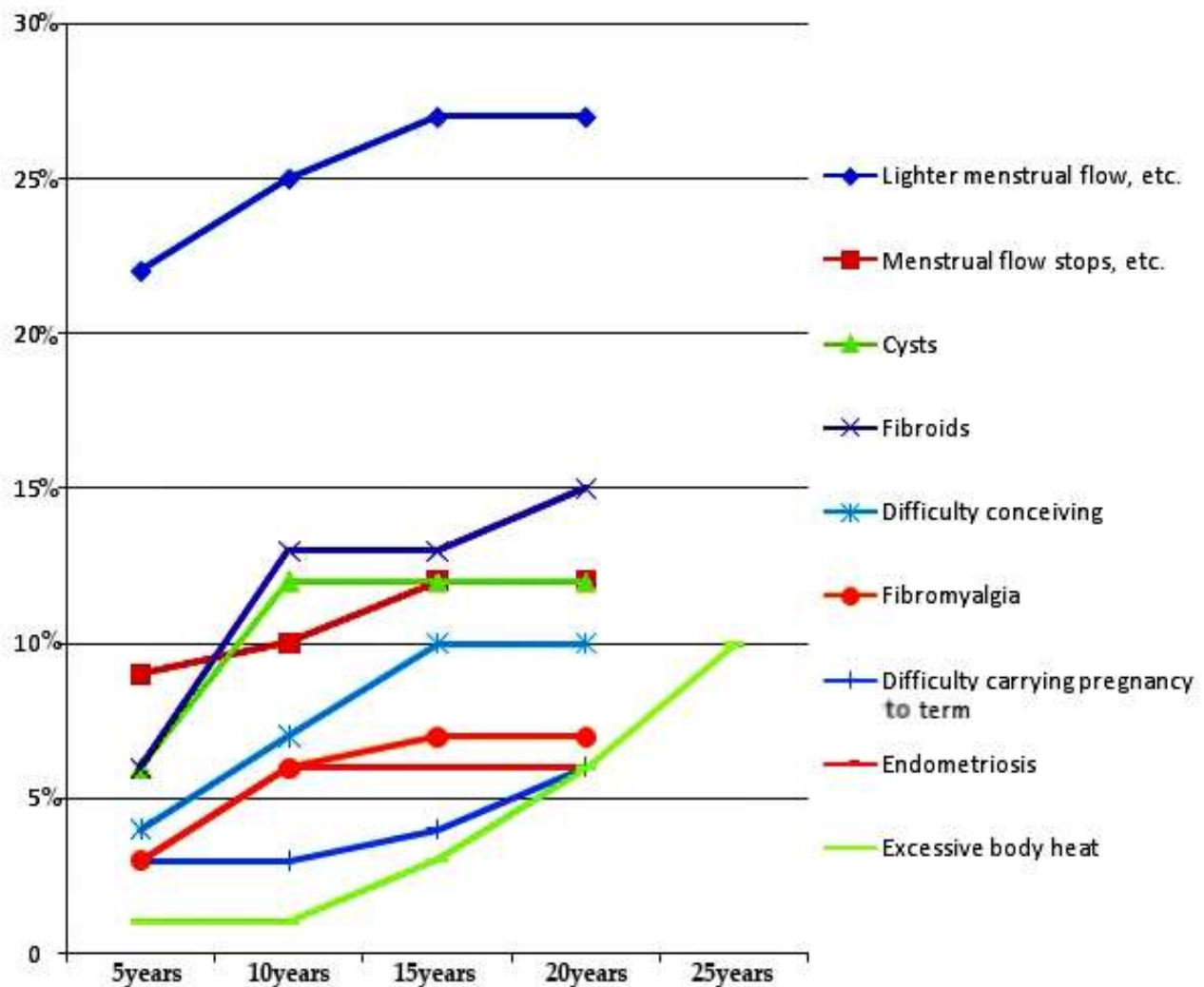
“Overall, FAs and schoolteachers report a higher prevalence of work related upper respiratory symptoms, chest illness, and cold or flu than the general working population.”

- Skin becomes dry and flaky, especially on the hands and face – 49%
- A high proportion (almost 30%) awake with dry mouth every morning.

My clinical observations indicate that the **large synovial membrane** that surrounds and supports the neck, spine and knees finds it difficult to nourish the vertebrae and the capsules that hold the knees and hips in place – since the spinal disks are 80% water, **these disks are prone to collapsing over time.**

The survey results demonstrate a high rate of increase in the progression of the prevalence of joint pain - hip (350%), knee (230%) and back (146%).

Liver Blood becomes deficient – Over 27% of female crew members report lighter, less regular menstrual flows within 15 years, and the menstrual flow turns bright red.



Discussion

A great deal of flight crew ailments can be traced back to the impact of the **aircraft cabin environment**.

During flight, the moisture content of aircraft cabin air ranges between 1% and 15%, comparing unfavorably to the average moisture content of the air in the Sahara Desert, which is about 20%. Most cockpit moisture content hovers around 1%, and pilots seem to be affected by this low humidity at a faster rate than Flight Attendants.

While we are flying the moisture is being wicked off from our lungs and skin at a rate of 2 to 4 ounces per hour. Replacing this lost water at regular intervals during flight is important for all aircraft passengers, and crucial to the good health of Flight Crews.

The effects of prolonged very slow dehydration by flight crew members can be quite varied and may sometimes even seem unrelated to their current state of health.

When we are deprived of yin fluids, disharmony develops in the body in patterns that can evolve way past what we may consider a thirst. This results in an ongoing pattern of disharmony in the affected person. These patterns of disharmony work their way deeper and deeper into the body over the years as it tries to compensate for the ever-decreasing yin fluids and the increasing disruption of vital functions that sustain good health.

As part of my clinical practice, I have interviewed thousands of Flight Crews over several years. The following list of **Flight Crew Dry Symptoms** starts with the most superficial and ends with the deeper, more severe symptoms.

Flight Crew members who have been flying in a dry environment for a number of years, typically display some of the symptoms listed. Individual Flight Crew members develop their own unique patterns of disharmony.

Knees and back may start to feel tight on exertion

Mild night sweats

Mild back or knee pain

Waking with dry mouth

Dry skin -- dry eyes

Nail fungus -- nasal infections -- yeast infections

Insomnia

Constipation

Mild acid reflux

Lighter menstrual flow, less regular, and turns bright red

Difficulty conceiving and in carrying pregnancy to term

Sleep becomes very difficult

Body feels warm all the time -- heat is exacerbated by menopause

Palms of hands and soles of feet feel warmer than the rest of the body

Moderate to severe knee, back and hip pain

Night sweats intensify

Onset of mild depression

Nail fungus, nasal infections and yeast infections intensify -- chronic sinusitis

Difficulty staying warm -- the cold feels deeper

Headache starts at the nape of neck, travels up the back of the neck then moves around the top of the ear into the eye

Aversion to cold -- chilled easily

Menstrual flow stops for months at a time, may be clotty and painful

Headaches intensify to make the eye or eyes throb (may feel like "a bolt of lightning across the eyes")

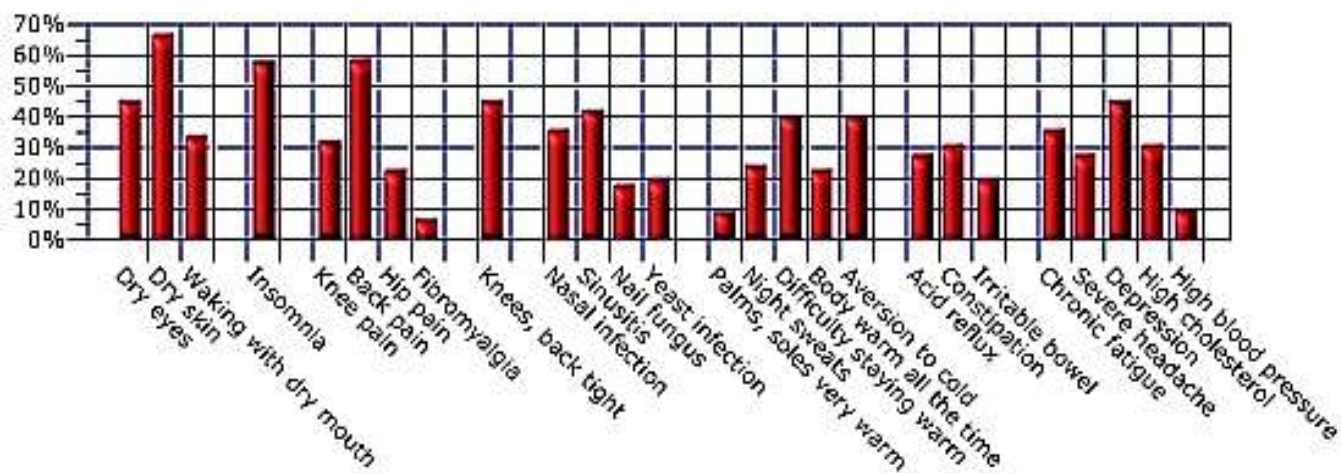
Fibroids -- endometriosis -- cysts

Irritable bowel -- acid reflux -- chronic fatigue -- fibromyalgia

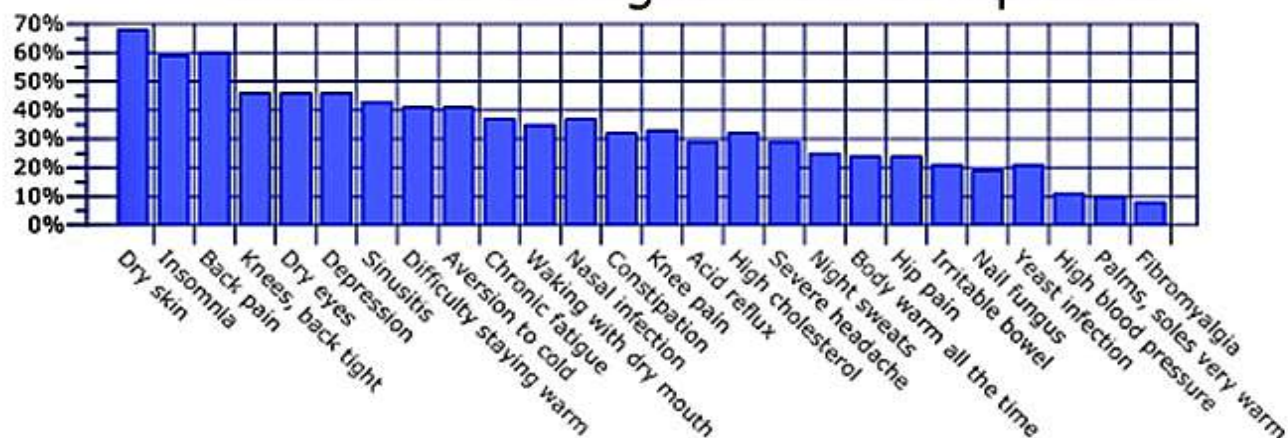
Chronic knee and back pain.

The following charts show the percentage of commercial airline flight crew members who were experiencing these symptoms at their survey date.

Health Issues (Grouped by Type)



Incidence of Flight Crew Complaints



Some suggested treatments for Yin Deficiencies

Sinusitis:

After treating hundreds of cases of sinusitis in flight crews, I have observed that typically when a flight crew member flushes his/her sinuses with a saline solution there are very fine streaks of blood in the discharge, resembling a spider web pattern.

My interpretation of this is that the main contributing factor is the exposure of the sinus membranes to dry air for prolonged periods, causing dehydration and corruption of the capillary beds in the sinus membrane. The simple act of blowing the nose or sneezing can cause these compromised capillary beds to rupture, exposing the membrane to infection.

Because of this I developed **Mucosa Gel**. This product contains Chinese herbs (*Huang Qi* to auto-immunize and help cell integrity, *Dan Shen* to increase blood circulation, *Clear Heat* to eliminate toxins, *He Sheu Wu* and *Gui Ban* to balance fluid) and iodine (to kill fungus, bacteria and viruses) in a glycerine gel.

The inside of the nose is coated with **Mucosa Gel** as often as needed to relieve congestion. Some individuals need one application of **Mucosa Gel** every hour for the first few days, tapering off to 2 or 3 times per day. The need decreases gradually over time, so that eventually the gel may need to be applied only once every 5 days.

Dry skin:

51% of the respondents stated that they were suffering from Dry Skin at the time that they took the survey. The mechanism appears to be that dehydration of the very fine capillary beds on the surface of the skin causes blood stasis, as well as the drying and sometimes flaking and scaling of the skin.

In certain cases, I recommend **Eight Flavor Tea** from Health Concerns (*Zhi Bai Di Huang Wan*), to nourish the liver, kidney, stomach and spleen yin, to clear stomach heat and heart fire, and to tonify kidney and spleen qi.

I have also developed a **moisturizing soap** called **Herbal Pearl** which uses *San Qi* to break up blood stasis, *Dan Shen* to move blood, *Bai Hua She She Cao* to absorb toxins, *Ginseng* and *Gui Ban* to balance fluid.

Blood Deficiency:

From my clinical practice with flight crews it appears that the cause of the high prevalence of blood deficiency is that the blood becomes damaged as a result of dry skin and lung yin deficiency. This prevents the lung from communicating with the kidneys, cascading the body into a systemic yin deficiency.

In general, the tongues of flight crews were observed to be shrunken, dry and pale as compared to my non-flying patients. Some have many cracks, with an almost sandpaper texture on the top of the tongue. Their pulses are usually very thin and wiry.

In his lectures at Zhejiang Chinese Medical University in Hangzhou, China, Dr. Boping Wu stressed the importance of treating any blood pathology first – or at least to incorporate this treatment in one's protocol.

I have been very successful in most cases in using **Ba Zhen Tong** - with *Gui Ban* and/or *Shi Hu* (to tonify and moisten blood) – and lately I have been using *Bai Hua She She Cao* to detox the blood.

Dry eyes:

I recommend 3 to 4 capsules of **Qi Ju Di Huang Wan**, three times daily.

Candida (yeast) infections:

These can be localized in the sinuses and vagina or may be systemic (throughout the whole body). Yeast infections – local or systemic - can return over time with more vigor and be more resistant to whatever was used to treat them in the past, especially if the previous treatments were of a short-term nature.

A **consistent multi-antifungal approach** is therefore needed over a prolonged period of time, with treatment times for local infections lasting for 6 weeks and very chronic serious Systemic Candida infections requiring up to two years of treatment.

The treatment for systemic yeast infections is beyond the scope of this paper.

Mucosa Gel Testimonials

(Doug W., Virginia)

Dr. Campbell,

I talked with you down by the pool at the Sherry last Saturday night and bought a bottle of Mucosa Gel. The stuff works great! I gave away your brochure to my first officer. Would you mind sending me a few more so I could keep one and pass them out? I especially like the insert covering supplement suggestions for crew members.

Thanks again, I enjoyed talking to you. You have a great product!
Doug

(Daisy L.)

Hope all is well. This note is to say thank you very, very much. I have not felt this good in a while. With only one acupuncture session, I was able to move my arm above my shoulder - after months of constant pain. I would say I feel about 75% better. I am looking forward to feeling 100%.

I have to add that the Mucosa Gel works great. My granddaughter and I can breathe plus wake up with no sneezing and no headache.

Thank you. God Bless.
Daisy

(Tricia A., Colorado)

I have been using your product Mucosa Gel on a daily basis since September 24. My allergies have lessened significantly. I would on a daily basis take Sudafed for allergy alleviation. I have not taken Sudafed at all in the past two weeks. I am a true believer in your product and would highly recommend it to anyone with allergies.

Thank you for your expert advice and your product.

Tricia

(Allea M., Jamaica)

The Mucosa Gel works great. I can sleep with a fan and not wake up congested. I feel much clearer, my sinuses have improved. I used to wake up congested; when it is very hot I used to suffer from sinus headaches; also when it rains.

I really feel much better, when the air is moist I am more aware of my sinuses but it does not sap my energy nor does it immobilize me.

Thank you for the product and all that you have done so far for improving my health!
Allea

(Gio F., Florida. Asthma and chronic sinusitis since childhood - over 18 years)

I have been using the Mucosa Gel for the past 3 weeks:

I feel much better with just one application until I need another at night which I apply religiously before bed.

As far as using my inhaler; I have not had the need to do so now that I am using Mucosa Gel. I still get the urge to use my fast-acting albuterol inhaler especially after I have eaten a big meal; which I usually did in the past. However, this time I do my best to control myself and simply apply the gel to my nose which allows me to breathe without any hesitation just about 15-20 minutes after I have applied it.

Thanks again for all your help.

Gio

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