Oxidative Stress Index (OSI) Condensed Questionnaire

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Abstract—The Oxidative Stress Index (OSI) has been shown to predict the onset of non-communicative disease. A condensed form of the OSI questionnaire has now been developed to enable meaningful OSI data to be obtained from answers to only eight questions, rather than from the 400+ items contained in the original detailed questionnaire.

Index Terms—Disease onset mechanism; Environmental disease cause; Oxidative stress and disease; Predicting disease onset.

I. INTRODUCTION

Elevated oxidative stress (OS) is well known to be a direct cause of disease [Kelly, 2003; Zeliger 2016; Riggs, et al., 2020] and the oxidative stress index (OSI) has been shown to be an indicator of the likelihood of non-communicable disease onset [Zeliger, 2017]. The OSI can also be used in multiple other applications, including predicting disease causing parameters for Alzheimer’s disease and other diseases [Zeliger, 2019], as a public health survey instrument [Zeliger, 2019a], predicting adverse drug reactions [Zeliger, 2019a] and as a health prescreening tool and for health screening in areas with limited medical facilities and personnel [Zeliger, 2017].

The detailed OSI is based upon responses to a detailed questionnaire that address all contributory items to a person’s OS level. In addition to being a valuable predictor of disease onset likelihood, it is also an indicator of lifestyle changes that can be made to lower OS and thereby help prevent disease. The OSI addresses genetics, age, weight, illnesses, conditions that are exacerbated by increased OS, medical symptoms, clinical laboratory results, prescription medications regularly taken, lifestyle and emotional stress.

The length of the detailed OSI questionnaire (containing more than 400 items), however, does not readily lend itself to regular use in clinical settings. Presented here and shown in table 1 is a condensed form of the OSI questionnaire, containing only eight parts, which can be readily used as a screening device to indicate the OSI level. Analysis has shown that OSI values obtained from the condensed OSI form produce scores that are nearly identical to those obtained using the detailed OSI form. As discussed below, these include all major sources of OS elevation and produce OSI values that are within 90 percent of those obtained using the detailed OSI questionnaire.

II. METHODS

The OSI condensed form is based upon health impacts of the various parameters as reported in the literature. The scoring assignments for the individual parameters in the condensed form are based upon experience with the detailed OSI form. The point values assigned to each parameter are based upon those obtained via the detailed OSI questionnaire.

III. RESULTS AND DISCUSSION

A. Age

Aging is accompanied by an increase in OS, generally starting around age 40 and continuing throughout life [Epel, et al., 2004; Hou, et al., 2015]. Accordingly, one OSI point is scored for each decade. For one aged 40-49, one OSI point is added to his or her total, 2 points are added for those aged 50-59, etc. [Zeliger, 2017].

B. Personal

Being overweight is associated with elevated OS and the onset of numerous diseases. Excessive weight is a worldwide health issue that continues to grow. In the United States, more than 70 percent of adults are overweight, more than half of whom are obese [CDC, 2018]. Diseases associated with excess weight include, but are not limited to; hypertension, dyslipidemia, type 2 diabetes, coronary heart disease, stroke, gallbladder disease, osteoarthritis, sleep apnea, breathing difficulties, anxiety, depression and several cancers (endometrial, breast, colon, kidney, liver and gallbladder [CDC, 2015]. Gender, height and weight information enables one to determine if the person is of normal weight, is heavy, or obese. The original detailed OSI addresses weight impact by number of pounds a person is overweight [Zeliger, 2017]. The condenses OSI categorizes weight into three categories; normal, overweight and obese. Normal weight is assigned a value of zero. Heavy individuals are assigned a score of 1 and obese people are assigned a score of 2.

C. Chronic Prevalent Diseases

The number of prevalent diseases at the time of OSI measurement is a critical indicator of OS. It is well established that disease increases total OS and hence the OSI [Zeliger, 2016; Zeliger 2017]. All diseases have
symptoms associated with them. These are individually addressed in the detailed OSI. The OSI condensed form does not probe individual symptoms. Rather, it has been found that assigning five points for each prevalent disease adequately incorporates elevations in OS associated with the prevalent diseases. Respondents are asked to list all diseases they currently have been diagnosed with. Multiplying the number of prevalent diseases by five yields the disease number in the condensed OSI.

D. Medications

Essentially all pharmaceutical medications raise OS [Zeliger, 2017] and all have adverse drug reactions associated with them [Zeliger, 2019b]. The detailed OSI form addresses these individually. In the condensed form, one OSI point is assigned for each medication taken.

E. Genetics

Genetics is well known to be a factor in most non-communicable diseases [Dato, et al., 2013; Jiang, et al., 2013; Guillamaet-Adkins, et al., 2017]. Indeed, many diseases such including Alzheimer’s disease, Parkinson’s disease and cancers, just to name and few, “run in families.” Recently, epigenetics, as well, has been shown to lead to heritable diseases [Cencioni, et al., 2013; Guillamaet-Adkins, et al., 2017]. Though all non-communicable diseases are more prevalent in those whose ancestors have suffered from those diseases, parental disease is most closely associated with the likelihood of disease onset in an individual [Awdheh, et al., 2006]. Both genetic traits and epigenetic effects raise OS [Cencioni, et al., 2013; Dato, et al., 2013; Jiang, et al., 2013; Guillamaet-Adkins, et al., 2017]. In the condensed OSI form, respondents are asked to check which of their prevalent diseases were also prevalent in their parents and each genetic link is assigned a value of one OSI point.

F. Education

Socioeconomic status (SES) is well established as an indicator of detrimental lifestyle choices that raise OS [Mielck, et al., 2014]. These lifestyle choices include diets high in fats, sugar, salt or processed foods, tobacco, alcohol and recreational drug abuse, radiation exposure and the need to reside or work in a toxic environment [Zeliger, 2016]. SES is also associated with an increased likelihood of having undiagnosed diseases [Bein, et al., 2012; Mielck, et al., 2014; Shaw, et al., 2016].

The detailed OSI lists numerous items that address these points. In the condensed form, all of these are factored into SES as indicated by highest educational level achieved. Educational achievement has been shown to be a valid indicator of SES, with lower SES individuals more likely more likely to lead unhealthy, OS raising life styles and to have undiagnosed diseases [Yin, et al., 2017]. In the condensed OSI form, 5 education levels are identified: some high school, high school graduate, some college, college graduate and graduate degree. These are assigned 5,4,3,2 and 1 OSI point respectively.

SES can also be obtained from annual income information, but asking income information can be considered being nosy and discourage some people from completing the questionnaire. Hence, income is not used in the condensed OSI questionnaire.

G. Residence

In the 21st century, 90 percent of the world’s people, regardless of SES, are exposed to air pollution, as air quality is the same on both sides of the tracks [Combes and Franchineau, 2019; World Health Organization, 2018]. All air pollutants are toxic, raise OS in a dose response relationship, impact the OSI, and are responsible for the onset of numerous diseases including respiratory diseases, cardiovascular diseases, several cancers and Alzheimer's disease [Combes and Franchineau, 2019; Zhou, et al., 2019; Xia, et al., 2019; Kilian J and Kitazawa M, 2018].

Recently, a method to quantify air pollution impact on disease onset, termed the Air Quality Toxicity Index (AQTI) has been reported [Zeliger, 2020]. This method, based upon the dose response relationship between toxic exposure and OS elevation [Zeliger, 2016 and the numerous references contained therein], enables the classification of air quality for individual locations to be calculated and reported as cumulative annual values.

In America, the United States Environmental Protection Agency (EPA) measures air quality in multiple locations on a daily basis and reports the data on-line daily as the Air Quality Index (AQI) [EPA, 2019]. Worldwide, the World Air Quality Project similarly reports air quality data for hundreds of cities. [World Air Quality Index Project, 2019]. On an annual basis, these indices identify the number of days in which the air quality in a given locale is classified as either good, moderate, unhealthy for sensitive groups, unhealthy, very unhealthy or hazardous. Hazard numbers ranging from 1 – 6 have been assigned to the six air quality classifications, as follows [Zeliger, 2020].

| Air Quality Classification | Hazard Number |
|---------------------------|---------------|
| Good                      | 1             |
| Moderate                  | 2             |
| Unhealthy for Sensitive Groups | 3       |
| Unhealthy                 | 4             |
| Very Unhealthy            | 5             |
| Hazardous                 | 6             |

The air pollution impact on OSI is obtained by multiplying the number of days per year for each of the six EPA classifications at the residence of the responder by the hazard number for that classification and adding the these up to yield the AQTI total as shown in table 3. Also shown in table 3. are the OSI air pollution severities (OSI – AP). These are assigned number values from 0-5, and entered into the OSI condensed form. It should also be noted that EPA publishes daily and annual air quality data for cities and counties in all U.S. states [EPA, 2019].

H. Chronic Psychological Stress

Psychological stress, anxiety and depression are associated with most diseases and are more pronounced as illnesses progress [Sahle, et al., 2020]. Psychological stress, anxiety and depression raise OS via the release of hormones that elevate OS. Chronic activation of this stress response system results in disease and triggers numerous health problems [Mayo Clinic, 2019], including: Anxiety

DOI: http://dx.doi.org/10.24018/ejmed.2020.2.1.163
Depression
Memory and concentration issues
Digestive problems
Headaches
Heart disease
Sleep problems
Weight gain

Respondents are asked to check if they often feel stressed, anxious or depressed. One point is assigned for each positive response.

The relevance of the OSI to predicting disease onset probability as well as for other applications uses has been previously established [Zeliger, 2017, 2019, 2019a, 2019b, 2019c]. When the OSI condensed form values are used as presented here an excellent correlation between standard form and condensed form OSI values obtains, with condensed form values showing less than a 10% variation from standard form values.

To sum up, the point values assigned to each of the parameters contained in the OSI condensed questionnaire are as follows:

| Age        | 1 for each decade of age starting at age 40. |
|------------|--------------------------------------------|
| Personal   | 0,1, or 2, depending upon weight status    |
| Diseases   | 5 per prevalent disease                    |
| Medications| 1 per prescribed or over-the-counter medicine regularly taken |
| Genetics   | 1 per each item checked                    |
| Education  | 5,4,3,2 or 1, depending upon highest education level achieved |
| Residence  | 0,1,2,3,4, or 5, depending upon air pollution level at residence |
| Stress     | 0,1,2 or 3, depending upon chronic psychological status |

The OSI score has been shown to be related to the likelihood of further disease onset as follows [Zeliger, 2017]:

| OSI Level  | Disease Likelihood                  |
|------------|-------------------------------------|
| 0-15       | Indicative of good health           |
| 16-30      | Disease onset predicted             |
| 31-45      | Disease onset probable              |
| 46 or higher | Disease imminent                     |

Though the OSI can predict the likelihood of disease onset, it cannot predict which disease(s) are likely to strike.

The condensed OSI form has multiple uses, including the following:

- Part of routine medical examinations to alert clinicians to potential illnesses in seemingly healthy people.
- Use as a screening aid in areas with limited medical personnel and facilities.
- Serving to identify lifestyle changes that will lower OS and likelihood of disease onset.
- Taking of public health surveys to identify disease clusters arising from exposures to chronic exposures to toxic chemicals.
- Making community medical need projections including estimating clinical staffing and resource needs.

- Serving as an indicator of the need to have a person fill out the detailed OSI form which can alert clinicians to specific potential problems.
- Researching sequences of disease onset in those with multiple diseases.
- Predicting numbers of people likely to ail with non-communicative diseases in different geographic areas.

The detailed OSI questionnaire has been modified since it was first introduced. The form currently in use to build a data base has the condensed form questions embedded in it, thus facilitating a comparison of the two forms.

The OSI condensed form does have limitations. It does not probe as yet undiagnosed diseases, conditions and symptoms that are addressed in the detailed form. Also, to date the number of OSI questionnaire responders evaluated is not yet large enough to yield statistically significant data. Work in this area is ongoing, with the understanding that the point values of the condensed form OSI can be adjusted, if necessary, and that additional parameters could be added to the eight reported here, if indicated. Despite the limitations just noted, preliminary results indicate that the condensed OSI form produces values that are 90 percent or more in agreement with that from the detailed OSI form.

IV. CONCLUSIONS

The premise of this paper is that a questionnaire consisting of eight parameters can be used to determine the OSI and that these are representative of all sources of oxidative stress elevation.

The eight parameters used to calculate the condensed form OSI all raise OS levels in dose response relationships [Zeliger, 2016]. These have all been shown to be additive in predicting disease onset likelihood, demonstrating that multiple causes of the same disease are probable, and that no single cause need be the sole one [Zeliger, 2019].

The condensed form of the OSI is a simplified version of the detailed OSI and that like the detailed OSI, can be used to predict the likelihood of disease onset.

V. REFERENCES

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Table 1. OSI condensed questionnaire.

| Date __________________ | No. ________ |
|-------------------------|-------------|

1. Age: _____

2. Personal:
   - female _____ male _____
   - height _____ weight _____

   Do you work with toxic chemicals or live near a toxic landfill
   - Yes _____ No _____

3. Diseases:
   - All diseases and diagnosed conditions you now have: _______
   - For cancer, add the stage (1, 2, 3 or 4) if known
     1. _______ 2. _______ 3. _______
     4. _______ 5. _______ 6. _______
     7. _______ 8. _______ 9. _______

   Which of these diseases were diagnosed in the last year: _______

4. Medications:
   - Number of medications regularly taken: _______

5. Family history:
   - Number of the above diseases parents had/have
     - Mother: _______
     - Father: _______

6. Education:
   - Check highest level achieved
     - some high school _____
     - high school graduate: _______
     - some college _____
     - college graduate: _______

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7. Residence: City State and County where you live. 
City ________ State ________ County ________

8. Stress: Check any that apply
Do you often feel: Stressed ______
Anxious ______
Depressed ______
Total __________

Table 2. Detailed OSI questionnaire.

OXIDATIVE STRESS INDEX (OSI) QUESTIONNAIRE

DATE _____________ NUMBER ________

GENDER Female ____ Male ____

AGE ____

EDUCATION Check highest level achieved
_____ some high school _____ high school graduate
_____ some college _____ college graduate
_____ graduate school

RESIDENCE City ________ State ________ County ________

FAMILY HISTORY

Put one check for each parent, sibling (sister or brother) or grandparent who has or had each of the diseases or conditions identified.

_____ Parent with neurological disease - Alzheimer's, Parkinson's, Lou Gehrig, ADHD or Autism
_____ Parent with diabetes
_____ Parent with heart disease, heart attack or stroke
_____ Parent with asthma or COPD
_____ Parent with allergies - hay fever, animals, food or chemicals
_____ Parent with cancer

_____ Siblings with neurological disease - Alzheimer's, Parkinson's or Lou Gehrig, ADHD or Autism
_____ Siblings with diabetes
_____ Siblings with heart disease, heart attack or stroke
_____ Siblings with asthma or COPD
_____ Siblings with allergies - hay fever, animals, food or chemicals
_____ Siblings with cancer

_____ Grandparents with neurological disease - Alzheimer's, Parkinson's or Lou Gehrig,
ADHD or Autism

____ Grandparents with diabetes
____ Grandparents with heart disease, heart attack or stroke
____ Grandparents with asthma or COPD
____ Grandparent with allergies - hay fever, animals, food or chemicals
____ Grandparent with cancer

Total Family History Checks ______

AGE

Check all age boxes that apply. If, for example, you are 55 years old check the first two boxes. If you're 82, check all 5 of these boxes

____ 40 or older
____ 50 or older
____ 60 or older
____ 70 or older
____ 80 or older

WEIGHT

Find your healthy weight, on the weight chart (see table 2.2 on page 46). Check all the weight boxes that apply. If, for example you are 40 pounds over your recommended weight, check the first three boxes and add three checks to the total. Find your recommended weight on the weight chart at the end of the OSI checklist.

____ 10 - 20 pounds overweight
____ 21 - 40 pounds overweight
____ 31 - 60 pounds overweight
____ 61 - 80 pounds overweight
____ 81 or more pounds overweight

Total age and weight checks ______

ILLNESSES and CONDITIONS

Check all illnesses or conditions that you have been diagnosed with and currently have.

____ Acne
____ ADHD (Attention Deficit Hyperactivity Disorder)
____ AIDS or HIV
____ Alcohol addiction
____ Allergic rhinitis (sinus inflammation)
____ ALS (Lou Gehrig's disease)
____ Anemia
____ Anorexia
____ Anxiety disorder
____ Arthritis
____ Asthma
____ Autism and ASD
____ Autism or autism spectrum disorder (ASD)
____ Benign prostate hyperplasia (enlargement - BPH)
____ Bipolar disorder
____ Bronchitis (chronic)
____ Bulimia
____ Bulging or herniated disc
____ Carpal tunnel syndrome
Cancer - Check all that apply. If stage three, for example, check first three

Cancer - stage 1
Cancer - stage 1 or 2
Cancer - stage 1, 2 or 3
Cancer - stage 1, 2, 3 or 4
Frequent infection
Frequent sinus infections (sinusitis)
Glaucome
Gout
Gum disease
Heart attack
Heart Disease or heart problems
Hemorrhoids
Hepatitis B (chronic)
High blood pressure (hypertension)
High cholesterol
Herpes
Inflammatory bowel disease
Irritable bowel syndrome (IBS)
Kidney disease
Leukemia
Liver cirrhosis
Liver disease
Lupus
Lyme disease
Macular degeneration
Malaria
Metabolic syndrome (pre-diabetes)
Middle ear infection (frequent)
Migraine headaches
Multiple chemical sensitivity (MCS)
Multiple sclerosis
Obesity
Osteoarthritis
Osteoporosis
Parkinson's disease
Periodontal disease (swollen or bleeding gums)
Post-traumatic stress disorder (PTSD)
Rocky Mountain spotted fever
Psoriasis
Rosacea
Schizophrenia
Sexually transmitted disease (STD)
Shingles
Sjogren's syndrome
Sleep apnea
Stroke
TB (Tuberculosis)
Thyroid disease
Tourette syndrome
Tremors
Ulcers
Varicose veins
West Nile Fever
Yellow fever
Zika

Write in the names of any other illnesses you have that were not listed above and check those.

____________________
____________________
Total Disease Checks  ____

DISEASE START

How many of the diseases checked above started in
____ The past 2 years?
____ The past 5 years?
____ The past 10 years?

SYMPTOMS

Check all the symptoms that you currently experience.
____ Abdominal pain (frequent)
____ Allergic reactions to chemicals
____ Allergic reactions to any foods
____ Allergic reactions to insects
____ Allergic reactions to medications
____ Allergic reactions to plants (Hay fever)
____ Ankle pain
____ Attention span decline
____ Anxiety often
____ Appetite loss
____ Bleeding gums
____ Blood in stool
____ Blood in urine
____ Blurred or cloudy vision
____ Bruise easily
____ Burning when urinating
____ Butterflies in your stomach often
____ Change in skin color
____ Chest pain
____ Constant chills
____ Constipation
____ Cough that is persistent
____ Coughing or spitting up blood
____ Decision making difficulties
____ Decline in learning ability
____ Decreased eye sight
____ Decreased sex drive
____ Diarrhea (frequent)
____ Difficulty completing familiar tasks
____ Difficulty concentrating
____ Difficulty getting warm
____ Difficulty maintaining balance
____ Difficulty solving problems
____ Difficulty swallowing
____ Difficulty walking
____ Difficulty concentrating or finding words
____ Dizziness
____ Drained of energy
____ Dreams that are bizarre and recurring
____ Excessive mucous production
____ Excessive thirst
____ Eye discomfort or pain
____ Eye redness
____ Fatigue
____ Feel depressed a lot
____ Feel less alert or fuzzy headed
| Symptom                                                                 |
|------------------------------------------------------------------------|
| Fever                                                                  |
| Food allergies                                                         |
| Foot pain                                                              |
| Foot swelling                                                          |
| Fungal infection such as athlete's food that persists                   |
| Frequent anxiety                                                       |
| Frequent depression                                                    |
| Frequent stress                                                        |
| Frequent headaches                                                     |
| Frequent indigestion                                                   |
| Frequent itching                                                       |
| Frequent rashes                                                        |
| Frequent urination                                                     |
| Graying of hair                                                        |
| Hair loss (not due to chemotherapy)                                    |
| Have itchy scaly skin rashes                                           |
| Headaches frequently                                                  |
| Hear voices inside you                                                 |
| Hearing loss that comes on suddenly                                   |
| Heart palpitations (throbbing)                                        |
| Heartburn                                                              |
| Hip pain                                                               |
| Hoarseness                                                            |
| Increased susceptibility to infections                                 |
| Indigestion (frequent)                                                |
| Insomnia                                                               |
| Irregular periods                                                      |
| Itchy hands                                                            |
| Itchy skin other than hands                                           |
| Jaw pain                                                               |
| Leg swelling                                                           |
| Learning new things more difficult                                     |
| Light headedness                                                       |
| Long recovery time from infections                                     |
| Losing track of time                                                   |
| Loss of coordination                                                   |
| Loss of muscle tone                                                   |
| Loss of taste                                                          |
| Lower back pain                                                        |
| Memory loss                                                            |
| Mood swings from very high to very low and vice versa                   |
| Mouth sores that don't go away quickly                                 |
| Muscle aches that last a long time                                     |
| Muscle cramps                                                          |
| Muscle spasms                                                          |
| Nasal congestion                                                       |
| Nausea                                                                 |
| Neck pain                                                              |
| Nervousness                                                            |
| Nightmares regularly                                                  |
| Nose bleeds                                                            |
| Knee pain                                                              |
| Numbness or tingling in hands or feet                                  |
| Pain in joints                                                         |
| Heart palpitations                                                    |
| Pelvic pain                                                            |
| Perspire (sweat) profusely                                             |
| Post nasal drip that lingers                                           |
| Post traumatic stress disorder (PTSD)                                  |
| Problems finding the words you want                                    |
Rapid hair loss
Rapid heartbeat
Scaly skin
Seizures
Shortness of breath
Shoulder pain that lingers
Sinus pain
Skin mole growth
Skin rashes
Sleep less than 7 hours per night
Sleep more than 9 hours a night
Slow to heal from cuts, bruises or other injuries
Slurred speech
Smaller field of vision
Sore throat that doesn't heal
Stressed out most or all of the time
Stuffy nose
Swollen eye lids
Tics (involuntary movements)
Tingling in the hands or feet
Tire easily
Tired most of the time
Tooth pain
Tremors
Twitching
Unusual vaginal bleeding or discharge
Urination difficulty
Urination pain
Varicose veins
Vomiting
Wake up more than 3 times per night
Weakness
Weight gain
Weight loss (rapid)
Wheezing
Wrinkling or loss of tone in skin
Yawning frequently

Total Symptoms Checks

TEST RESULTS

The following address results obtained from test doctors ordered done as part of annual examinations. Check all that apply to you.

High or low blood sugar
High or low BUN (blood urea nitrogen)
High or low calcium
High or low carbon dioxide (bicarbonate)
High or low chloride
High cholesterol
High or low creatinine
High glucose
High or low potassium
High PSA
High or low sodium
High triglycerides
Low blood oxygen
Low potassium
Total Test Results Checks

PRESCRIPTION MEDICINES REGULARLY TAKEN
Check each of the boxes that apply. If you regularly take five prescription drugs, for example, check all of the first 5 items, so that the total number of items checked equals the total number of prescriptions regularly taken.

- 1 prescription
- 2 prescriptions
- 3 prescriptions
- 4 prescriptions
- 5 prescriptions
- 6 prescriptions
- 7 prescriptions
- 8 prescriptions
- 9 prescriptions
- 10 or more prescriptions
- Have a heart pacemaker

Total Prescription Medicine Checks

DIET
Check each item that applies to the foods that are part of your regular eat.

- Alcoholic beverages (beer, wine, spirits) more than 1 drink per day
- Artificial sweeteners for coffee or tea
- Canned or frozen cooked foods regularly eaten (soups, pastas, meats)
- Bread and pasta made primarily from white processed flour
- Fast food frequently eaten
- Fewer than 3 fruits or vegetables a day
- Grilled, smoked or blackened meat, chicken or fish
- Food high in fat (whole milk, cheeses, foods cooked with butter and animal fat)
- Often eat processed foods (bacon, hot dogs, salami, sausages, deli meats)
- Eat red meat more than 2 times a week
- Eat foods high in sugar (sweetened drinks and desserts)
- Salty food

Total Diet Checks

LIFE STYLE
These items refer to where you live, the type of work you do and chemicals you may be exposed to.

- Are a farmer that regularly uses pesticides
- Burn wood for heat or for cooking
- Constantly use a cell phone
- Drink chlorinated water
- Drink more than one alcoholic drink per day
- Take steroids for muscle enhancement
- Exercise less than one half hour a week
- Have mold in your home
- Have new (less than 6 months old) carpet in your home
- Have pets in your home that you are allergic to
- Live down wind from a smoking industrial chimney
- Live in a city with air quality alerts
- Live or work close to a cell tower
- Live or work near high voltage electrical transmission lines
Live near a heavily traveled highway or road
Live near a landfill
Live near industrial storage tanks (chemicals, oil or asphalt)
Live with a smoker
Regularly experience allergic reactions in your home
Regularly experience allergic reactions in your work place
Regularly use room or furniture deodorants
Regularly play contact sports

Tobacco use. Check all of the items that apply. For example, if you smoke one pack of cigarettes a day, check both of the first 2 items. If you smoke two packs a day, check all of the first 4 items.

Smoke 10 cigarettes or less daily (even just one)
Smoke a pack a day (20 cigarettes)
Smoke a pack and a half a day (30 cigarettes)
Smoke two packs a day (40 cigarettes)
Smoke more than two packs a day
Smoke 1-5 cigars a day
Smoke 6 or more cigars a day
Use smokeless tobacco
Work as a toll booth collector
Work in very hot or very cold conditions regularly
Work in an adhesives or coatings manufacturing plant
Work in an agricultural chemical manufacturing plant
Work as an automobile, diesel or aircraft mechanic
Work with chemicals on the job regularly
Work in a dusty environment regularly
Work in a landfill
Work in a hair or nail salon
Work in metal refinery or mill
Work as a miner
Work in a noisy environment
Work in a paint, lacquer, stain or varnish manufacturing plant
Work as a painter
Work as a pilot or flight attendant
Work as a pesticide applicator
Work in a petroleum refinery
Work in a plastics manufacturing plant
Work in a plywood or particle board manufacturing plant
Work in a polluted environment (road paver, toll booth operator, for example)
Work in a water or sewage treatment plant
Work in wood treatment plant

Total Lifestyle Checks

OSI, Total of All Checks

Table 3. Annual air quality classification as shown by AQTI.

| AIR QUALITY CLASSIFICATION               | AQTI  | OSI-AP |
|-----------------------------------------|-------|--------|
| Good                                    | 365-450 | 0      |
| Moderate                                | 451-600 | 1      |
| Unhealthy for Sensitive Groups          | 601-750 | 2      |
| Unhealthy                               | 751-900 | 3      |
| Very Unhealthy                          | 901-1050 | 4     |
| Hazardous                               | 1051 or higher | 5     |