SOC Index and the Evidence for Lifestyle Medicine

By Desire' Dubounet, Prof. EMERITUS of IMUNE

IMUNE PRESS 2013
Hahnemann discovered that there were behaviors that could Block or Obstruct Cure like Allopathy. He said Allopathy would not let the Body cure itself but it would create dependence on chemicals and disruption of proper homeostasis. He also discovered that there were other behaviors that could Suppress Cure. So to honor Hahnemann and to start our medicine proper we developed the Suppression and or Obstruction to Cure Index. We call it the SOC index. Medicine should start with the Education of how to Improve Lifestyle and remove the causes of disease.

You must learn how to do the SOC Index to operate the SCIO properly.
Report Making with SCIO

You are able to give a client a report; there is nothing wrong with that you should have an understanding and best a waiver that specifies that you are not diagnosing or treating any disease other than stress, and the patient understands you are doing Biofeedback, Wellness, Nutrition consultation.

Giving a report from any of the items you mention the risks, causes, aggravations, and emotion charts from the report Or VARHOPE scores, Hans Seyle scale
Best is the SOC Index these are all fine if you have an agreement you are not diagnosing or treating a disease other than stress
There is a course on Report making in the 12 month IMUNE course
You should take the 12 month course and learn how to become a complete Wellness consultant.

CPT CODE
For SOC Index
90875

CPT CODE 90875 Individual psychophysiological therapy incorporating biofeedback training by any modality (face-to-face with the patient) e.g. insight oriented, behavior modifying, lifestyle education, stress reduction modalities) approximately 20-30 minutes.

The key of getting paid and for being Professional is doing the SOC Index
"This book will teach the basis of biofeedback report making. You can collect and report lifestyle, wellness, stress and symptoms as long as you do not diagnose or treat disease. You can treat people report on their lifestyle symptoms stress and catalog improvement. You have the freedom to advise people on being healthy."
You can build your report around

1. The SOC Index of Lifestyle changes to be made
2. Stress inventory of the patient
3. Symptom profiles of the patient as long as you do not imply disease states just observe symptoms
4. Reactivity profiles
5. Always use a disclaimer when writing a report
6. Provide proof of security of confidentiality of the data

SUPPRESSION AND OBSTRUCTION TO CURE

SOC Index:

The SCIO interview opens with a behavioral medicine interview. This is called the SOC Index. Named after the work of Samuel Hahneman the father of homeopathy, he said that the body heals itself with its innate knowledge. But the patient can suppress or obstruct the healing process with some behavior. Hahneman said that the worst way to interfere with the healing natural process was allopathy or synthetic drugs. Theses upset the natural healing process by unnatural intervention and regulation disturbance. Other ways to Suppress or Obstruct the Cure are smoking, mercury amalgams, stress, lack of water, exercise and many others. This behavioral survey then gives an index of SOC.

The scores relate to the risk of Suppression and Obstruction to the natural Cure. The higher the scores the more the Suppression and or Obstruction. The scores of 100 or lower are ideal. The SOC index questions are: mostly based on a canine (0-10) answer. Some answers can be more.

These questions include:

1. Number of organs removed:
2. Number of Synthetic drugs taken currently:
3. Number of cigarettes you smoke a day
4. Number of metal or amalgam fillings in the teeth during the last year:

5. Number of street drugs used per month:

6. Number of known allergies:

7. Number of unresolved mental factors:

8. Are you responsible for your body and the diseases you have:

9. Amount of fat in diet as a percent:

10. Personal stress 0-10 10 being max. Numbers can be larger than 10.

11. Number of sugar servings per day:

12. Number of exercise sessions 20 min or more per week:

13. Number of alcoholic drinks per day average:

14. Number of cups of coffee or any caffeine product:

15. Number of extreme toxic exposures last year:

16. Number of major injuries in past:

17. Number of major infections in past:

18. Number of glasses of water or natural fruit juice per day:

19. Number of pounds overweight:

20. Interpersonal stress 0-10 10 being max. Numbers can be larger than 10.

21. Job-school stress 0-10 10 being max. Numbers can be larger than 10.

22. Money stress 0-10 10 being max. Numbers can be larger than 10.

23. Sickness stress 0-10 10 being max. Numbers can be larger than 10.

24. Family stress 0-10 10 being max. Numbers can be larger than 10.

25. Desire stress 0-10 10 being max. Numbers can be larger than 10.

26. Bowel detox stress 0-10 10 being max. Numbers can be larger than 10.

27. Sweat detox stress 0-10 10 being max. Numbers can be larger than 10.

28. Urine detox stress 0-10 10 being max. Numbers can be larger than 10.
29. Mucous detox stress 0-10 10 being max. Numbers can be larger than 10.

30. Skin detox stress 0-10 10 being max. Numbers can be larger than 10.

31. Sleep stress 0-10 10 being max. Numbers can be larger than 10.

32. Number of Root canals:

   Each of these questions relates a behavioral burden on the body that can create a suppression or obstruction to the curative process. Scores below 50 are very good and show little risk of suppression or obstruction. Scores above 50 and below 100 are good and show some chance of suppression or obstruction to cure. Numbers above 100 are of risk.
Eductor

The word Doctor comes from the Latin word ‘Eductor’ which means ‘to teach’. Thomas Edison said that the doctor of the future will teach the patient how to live and how to eat, exercise and meditate. The Eductor is a Biofeedback Teacher.
Stress management versus lifestyle modification on systolic hypertension and medication elimination: a randomized trial.

Dusek JA, Hibberd PL, Buczynski B, Chang BH, Dusek KC, Johnston JM, Wohlhueter AL, Benson H, Zusman RM.

Benson-Henry Institute for Mind Body Medicine at Massachusetts General Hospital, Boston, MA 02114, USA.

Isolated systolic hypertension is common in the elderly, but decreasing systolic blood pressure (SBP) without lowering diastolic blood pressure (DBP) remains a therapeutic challenge. Although stress management training, in particular eliciting the relaxation response, reduces essential hypertension its efficacy in treating isolated systolic hypertension has not been evaluated. We conducted a double-blind, randomized trial comparing 8 weeks of stress management, specifically relaxation response training (61 patients), versus lifestyle modification (control, 61 patients). Inclusion criteria were ≥55 years, SBP 140-159 mm Hg, DBP <90 mm Hg, and at least two antihypertensive medications. The primary outcome measure was change in SBP after 8 weeks. Patients who achieved SBP <140 mm Hg and ≥5 mm Hg reduction in SBP were eligible for 8 additional weeks of training with supervised medication elimination. SBP decreased 9.4 (standard deviation [SD] 11.4) and 8.8 (SD 13.0) mm Hg in relaxation response and control groups, respectively (both ps <0.0001) without group difference (p=0.75). DBP decreased 1.5 (SD 6.2) and 2.4 (SD 6.9) mm Hg (p=0.05 and 0.01, respectively) without group difference (p=0.48). Forty-four (44) in the relaxation response group and 36 in the control group were eligible for supervised antihypertensive medication elimination. After controlling for differences in characteristics at the start of medication elimination, patients in the relaxation response group were more likely to successfully eliminate an antihypertensive medication (odds ratio 4.3, 95% confidence interval 1.2-15.9, p=0.03). Although both groups had similar reductions in SBP, significantly more participants in the relaxation response group eliminated an antihypertensive medication while maintaining adequate blood pressure control.

PMID: 18... [PubMed - indexed for MEDLINE]
Social Stress Inventory Form

DETERMINING THE SOURCES AND EXTENT OF STRESS IN YOUR LIFE THE SOURCES OF STRESS IN YOUR LIFE

Stress that is not handled properly can affect you in many ways. It can impair your ability to function mentally at home and at work. You can experience a variety of physical symptoms that can range from headaches to gastrointestinal upsets. Everyone experiences the negative effects of stress at various points in their lives. The danger lies in chronic stress overload. When your body is constantly in the fight or flight mode, you are bound to blow a fuse at your body’s weakest point. For some people the end result is a serious mental or physical illness.

This survey is designed to help you determine:

1) Your general level of stress.
2) Your level of stress at work.
3) Your physical symptoms of stress.
4) Your level of stress in interpersonal situations.

Take a look at the checklists that follow to see how stressed you are.

How Stressed Are You?

Directions: Indicate how often your feelings agree with the statements below. Scoring for each item is based on the following scale:

1 = Never feel that way
2 = Seldom feel that way
3 = Sometimes feel that way
4 = Frequently feel that way
5 = Always feel that way

How Stressed Are You? (General Feelings)

1. I worry a lot.
2. I feel unhappy.
3. All kinds of worrisome thoughts run through my mind.
4. There are times when I feel like crying for no reason.
5. I don’t know what’s the matter with me. I’m so irritable.
6. I have lost my ability just to sit around and do nothing.
7. I feel like I’m living inside a pressure cooker and about to explode.
8. Lately I’m bored with my life, job, friends and even my loved ones.
9. Deep inside, I’m dissatisfied and I don’t know why.
10. I forget things.

**Total Score =**

**How Stressed Are You? (Work Performance)**

1. I have trouble concentrating on my work.
2. It takes me forever to make decisions.
3. I can’t seem to stick to a job.
4. From the time I get there until I leave, I’m plain fidgety.
5. I overreact to things at work.
6. I let minor things get to me.
7. I procrastinate.
8. I can’t seem to get organized.
9. I’m unclear about my role at work.
10. I do a lot of paper shuffling.

**Total Score =**

**How Stressed Are you? (Physical Symptoms)**

1. My heart races or pounds.
2. I have trouble catching my breath.
3. I get diarrhea.
4. I have headaches.
5. I have to urinate frequently.
6. I get dizzy for no reason.
7. I spend my nights awake, or it takes forever to fall asleep.
8. I’m tired.
9. My throat and/or mouth is often dry.
10. My stomach is tense.
11. I have no energy.
12. I’m chilly.
13. My neck (or shoulders, eye, chest, lower back, throat, hands) is sore, stiff or painful.
14. Lately I seem to have one bug or cold after another.
15. In the afternoon I run out of steam.
16. My posture is terrible.

Total Score =

How Stressed Are You? (Interpersonal Relations)
1. I startle easily when people come up on me.
2. Around people, I can’t speak correctly.
3. I can’t stand to be around a particular person (or group).
4. I can’t stand to be around people when they are emotional.
5. I can’t tell anyone how I feel.
6. I don’t feel anything.
7. I can’t laugh at myself.
8. Down deep, I’m not happy with my sex life.
9. I don’t trust anybody.
10. I need help (food or drink) to be social.

Total Score =
### SCORING

<table>
<thead>
<tr>
<th>Category</th>
<th>No.</th>
<th>Total Score</th>
<th>Average Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Items</td>
<td></td>
<td>(Add Up)</td>
<td>(Divide Total Score by Number of Items)</td>
</tr>
<tr>
<td>General</td>
<td>10</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Work</td>
<td>10</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Physical</td>
<td>16</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Interpersonal</td>
<td>10</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ALL SCALES</td>
<td>46</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

To compute overall average score, add up your total scores for each scale and divide by 46. 5 is the highest score, 1 the lowest.

---

**Pharmacology Fact:**

To Use a SYNTHETIC anything is an Insult to the Body
Four Unhealthy Behaviors Linked to Premature Death
People who smoke, drink, rarely exercise, and skimp on fruits and veggies die earlier than usual, study finds

MONDAY, April 26 2010 (HealthDay News) -- A combination of four unhealthy behaviors -- smoking, lack of exercise, poor diet and substantial alcohol consumption -- greatly increases the risk of cancer and premature death, a new study has found.

The study, published in the April 26 issue of Archives of Internal Medicine, included 4,886 people, aged 18 or older, who were interviewed in 1984-1985.

"A health behavior score was calculated, allocating one point for each poor behavior: smoking; fruits and vegetables consumed less than three times daily; less than two hours of physical activity per week; and weekly consumption of more than 14 units [one unit equals 8 grams, or about 0.3 ounces] of alcohol (in women) and more than 21 units in men," wrote Elisabeth Kvaavik, of the University of Oslo, and colleagues.

Over an average follow-up period of 20 years, there were 1,080 reported deaths among study participants: 431 due to cardiovascular disease, 318 due to cancer and 331 due to other causes. Compared to those with no bad health habits, those with all four unhealthy behaviors were about three times more likely to die of cardiovascular disease or cancer, four times more likely to die from all other causes, and had an overall death risk equivalent to being 12 years older.

"Modest but achievable adjustments to lifestyle behaviors are likely to have a considerable impact at both the individual and population level," the researchers concluded. "Developing more efficacious methods by which to promote healthy diets and lifestyles across the population should be an important priority of public health policy."

This study shows what we all know to be true, there are certain behaviors that make us die early of degenerative disease. There have been many many MANY studies that show these same truths. It is a lack of education about these behaviors and also a lack of caring. These behaviors are easy to change.
Here are some simple things that won’t change your life. These are simple changes and you can have all the flavor, freedom and health for a better life.

1. Smoking first don’t start, resist peer pressure and don’t start.
You can quit the nicotine addiction is the most powerful addiction but it last only a few days. And after that you only have a mental addiction and with help you can beat it, if you care to. I have written a book on how to beat addictions if you need help. It is simple.

2. Diet. It is as simple as switching from dextrose sugars to levulose sugars, avoid all white sugar cane and eat fruit sugars. Do not eat food with trans-fatty acids, and switch from boiling foods in oil, to boil in water and add oil for flavor when it is cooled, but still warm. You will not miss a thing. The flavor will be there and you will be healthy. It just takes a little education and a little care.

3. Eat more fruits and vegetables less meat. This is good for you and the environment. The simple trick is using good spices and cooking to make the vegetables more appealing.

4. Over Cooking. Smoke in cooking also is a carcinogen. Smoke in any way is cancer causing. Foods over cooked and exposed to direct flame are more carcinogenic. Stir fry, low temp, sushi, Carpaccio, rare not well done, are just some ways to improve health. Eat more fresh and raw foods. And cook less, the more you cook a food the less nutrient’s it has.

5. Exercise. Exercise is a nutrient. We are designed to chop wood and carry water. Our bodies require exercise like we require air, water and food. Just a little walk, a little stretch, a little calisthenics, or even isometrics can make a big difference.

6. Alcohol. A little bit of alcohol is good for you. It is only over dosing that is bad. The relaxing, euphoric joyful effect of alcohol comes only from the first and second drink. Two drinks are all it takes to feel good. After that alcohol only makes your thinking disturbed. After two drinks switch to alcohol free, virgin drinks or just water and you will not miss any of the fun. It is often only peer pressure that makes you drink on and on, or just stupidity. The third and more drinks will not make you feel better; they will maybe make you feel worse. When I switched to non alcohol drinks in the night club after the first two I found no change in my level of fun and I could dance mare and sex was better. Alcohol is dangerous in excess.

7. Ignorance, obstinacy, hard headed stupidity. To ignore these things and say well my Uncle Sam lived to be 80 and he smoked and drank and never ate a vegetable. Well first the question is
how did Uncle Sam truly die? And next the undeniable evidence is that your supposed uncle would have lived 12 more years if he was not as ignorant as you are. Please resist the urge to rationalize, twist, distort, deny, and ignorantly contradict the truth. You look really stupid and not caring of anybody when you do. And yes any of you can change, these changes are simple.

8. Lack of CARE. If you don’t care for your children, your spouse, your friends, your family or for yourself then just let yourself die. But if there is some small thing that you care for then show some compassion and make these small changes.

Some simple changes that not only make you live longer but might help you avoid an ugly painful death of lying in a puddle of your own piss and shit from cancer. These simple changes are the beginning of a true Health Care.

---

**UCSF Scientists Declare WAR on Sugar in Food**

By_alilay, Chronicle Staff Writer

02/09/13

Like alcohol and tobacco, sugar is a toxic, addictive substance that should be highly regulated with taxes, laws on where and to whom it can be advertised, and age-restricted sales, says a team of UCSF scientists. (University of California San Francisco)

In a paper published in Nature on Wednesday, they argue that increased global consumption of sugars is primarily responsible for a whole range of chronic diseases that are reaching epidemic levels around the world. The health care expense of sugar caused diseases is massive.

Sugar is so heavily entrenched in the food culture in the United States and other countries that getting people to kick the habit will require much more than simple education and awareness.
Deaths due to Preventable Diseases:
UNNECESSARY DEATHS

- If U.S. did have the best health care in the world and was in top 3
  - 101,000 lives saved by preventing diseases

- If U.S. was average
  - 75,000 lives saved by preventing diseases

Current U.S. Performance

Accidental Deaths in the U.S.

An estimated one million people are injured by errors during hospital treatment each year and 120,000 people die as a result of those injuries, according to a study led by Lucian Leape of the Harvard School of Public Health. Here’s how that number compares with other causes of accidental death in the United States.*

*SOURCE (for accidental deaths shown in blue): National Safety Council. Data are for 1996.
KEVIN BURKETT / Inquirer Staff Artist

- 120,000 deaths from medical error
- 43,649 motor vehicle deaths
- 14,986 deaths from falls
- 3,959 drowning deaths
- 329 commercial aviation deaths
Deaths among children aged 28 days to five years
6.6 million/year

The shaded area shows the % of deaths from this infection that are due to the presence of undernutrition
Salt
White Sugar
Pork Fat (the other white meat)
White Flour

4 White Deaths

Number of Child Deaths Per Day Due to Child Abuse and Neglect


3 3.19 3.26 3.23 3.13

3.26 3.16 3.08 3.11 3.82 3.72 3.08 4.19 4.82

2000 2001 2002 2003 2004 2005 2006 2007
IGNORANT

Only 1 percent of the estimated 2.2 million cases of adverse drug reactions in hospitals are reported to the FDA each year.

Synthetic drugs No 1 Killer
There are several OTC (over the Counter) simple diseases like STRESS that unlicensed Therapists can treat and advise about.
Tobacco is the Number one Killer

Anyone allowing Children to Smoke is guilty of Reckless Endangerment
The doctor of the future will give no medicine, but will interest his patients in the human frame, in diet, and in the cause and prevention of disease.

-Thomas A. Edison
Dextrose enters the Cells directly and thus makes the pancreas put out twice as much insulin as Levulose. Levulose (aka Fructose) must go to the liver for conversion and thus is more Healthy in delivery.
Stress produces excess Cortisol, weakens adrenals, produces excess blood sugar, excess insulin, this makes you crave foods and eat more which increases blood sugar and insulin, which increase cortisol make you irritable and more sensitive to the next stressor.
Like alcohol and tobacco, sugar is a toxic, addictive substance that should be highly regulated with taxes, laws on where and to whom it can be advertised, and even age-restricted sales, says a team of UCSF scientists. (University of California San Francisco)

In a paper published in Nature on Wednesday, they argue that increased global consumption of sugar is primarily responsible for a whole range of chronic diseases that are reaching epidemic levels around the world. The health care expense of sugar caused diseases is massive.

Sugar is so heavily entrenched in the food culture in the United States and other countries that getting people to kick the habit will require much more than simple education and awareness.
Extra high levels of dextrose in the blood will diminish white blood cells and thus weaken immunity, irritate nerves, weaken cell membranes, lessen healing repair, and over-all decrease health.
Eat at least Five servings of fruits and Vegetables a day, use Vegetables as the Center of the Meal. Remember: do not eat foods boiled in oil, get good cold processed vegetable oils and thus good Fatty acids, not trans or cooked or animal oils. Eat only Levulose (fructose fruit sugars) not Dextrose (Cane, Corn, Potatoe, Grape sugar). Wellness is your Reward. Remember to chew your food, Fruits alone, Fluids alone, and Melons alone. Make Vegetable and Fruit juice part of your daily Wellness Healthy Regime.
Nelson Medicine
What the Biofeedback device can do for you
OUR CONTRACT FOR HEALTH

There are many key philosophies behind Nelson medicine. The first is responsibility. The patient is encouraged to accept responsibility for their body and any disease or discomfort. The disease might have been caused by someone else or some outside imposition, but healing can only take place inside the body. Obsessing on someone else or blaming someone else is unproductive and sometimes damaging. Separation from a cause of disease is the responsibility of the diseased patient. If there is a cause of disease in your environment you can choose to change or reduce the cause, move to a new environment, or accept the conditions. Responsibility for healing is with the patient.

Many of the causes of disease that approach us are beneath our conscious awareness. Our unconscious is much more aware of the disease causing factors that come at us. Our unconscious reacts with subtle energetic changes in electrical bodies. The biofeedback device is the first energetic medicine device to test reactions where the patient and doctor both do not know what is being tested. Thus the unconscious of the patient causes the reactions. The reactions are not picked by the computer but are picked by the unconscious of the patient. So we have a device that can make us aware of the unconscious. Some patients are more aware of their unconscious. These patients are likely to feel the biofeedback device and recognize the reaction patterns more easily. Others will take more time, but after several visits they will become more aware of their unconscious and feel the effects more.

WHAT IS HEALTH

Health is ease of flow.

Health is a flow of items into and out of the body. We intake nutrients, air, water, minerals, amino acids, fats, carbohydrates, thoughts, ideas, friendship, love, respect, mental stimulation, spiritual stimulation, and a host of other nutrients. We detox and excrete urine, breath exhale, stool, mucus, sweat, menses, bad feelings, fixations, addictions, Coercions, intimidations, fetish, manias, compulsions, spiritual doubts and a host of excretions. Life is a cycle of intake, chew absorb or reject, assimilate, produce toxins, detox, and start anew. This is the need to survive. Add to this the need to reproduce and now enters our sexual needs. All of this results in a very complex flow of energies in and out, in cycles.

The levels of the person are the body, mind, spirit, social, and environmental. It is impossible to separate these or to know where one starts and another stops. Thus these parts cannot be reduced or analyzed separately. When there is ease of flow of things in these levels the person is in health. Health is ease of flow.
FLOW OF DISEASE

Disease starts when a stressor or intrusion causes a disruption in the flow. The ease is now dis-ease. Hans Selye outlined a medical system where disease comes into the body as some sort of stressor. This produces an ALARM reaction phase as that the body is trying to deal with the incoming stress. Thus the symptom is a sign of the ALARM reaction. If we fight the symptom not the cause we stop healing. So when our child is exposed to a stress (like a bacteria from another child) a symptom presents, such as a sore throat. The symptom is sign of a disease in flow. The immune system needs help. To fight the symptom is what allopathy does. The allopathic medical doctor fights the symptom by trying to block some other flow. He uses an anti-pyretic for fever, MAO inhibitors for depression, Serotonin uptake blockers for despair, calcium blockers for heart problems, etc.

So our child with the sore throat might have a toxin or nutritional deficiency as the deeper cause of the sore throat. The body is attempting to detox and stimulate the immune system with the symptom. The body is trying to cure itself and everything would be alright but via a unfortunate twist of fate, this child is taken to an allopath. He spots the symptom right off, and prescribes an antibiotic and an anti-inflammatory. The body own attempts for healing and detox are thwarted. The disease is driven deeper. The symptom goes away but the cause lingers and another disease, more insidious than the first continues to develop.

As the stress continues the body acclimates and goes into the ADAPTATION phase. Here the symptom goes away from familiarization. But the disease progresses deeper. We now come to an ultra important conclusion that must change medicine forever. **BEING SYMPTOM FREE IS NOT A SIGN OF HEALTH.** In fact you can be symptom free and quite sick. Allopathy is for crisis intervention only.

If the stressor continues the body now progresses from the ADAPTATION phase to the EXHAUSTION phase. Here organs weaken. The first form is the FUNCTIONAL phase where organs dysfunction. They make less or excess hormones, enzymes, or others. After a while they slip into the ORGANIC phase, where here the organs or organ will shrink (atrophy) or grow(hypertrophy). There now is a physical disease. If the stressor continues the last phase results which is DEATH. Cellular death, organ death, organ system death, organism death. The next diagram relates the flow of disease.

<table>
<thead>
<tr>
<th>HEALTH</th>
</tr>
</thead>
<tbody>
<tr>
<td>ADAPTATION</td>
</tr>
<tr>
<td>EXHAUSTION</td>
</tr>
<tr>
<td>FUNCTIONAL</td>
</tr>
<tr>
<td>ORGANIC</td>
</tr>
<tr>
<td>DEATH</td>
</tr>
</tbody>
</table>

STRESSOR (TOXIN ETC)----->>>-------->>>
The causes of disease or possible stressors are:

- Lack of awareness
- Toxicity
- Stress
- Trauma
- Injury
- Heredity
- Pathogens
- Allergy
- Deficiency or excess of nutrients
- Mental factors
- Perverse energy

When these enter the body they disrupt the ease of flow. This produces the Alarm symptom. Then the body adapts, symptoms go away, but if the cause continues the disease continues. **Being symptom free is not a sign of health.** The ability to restore or heal the body is based on how much life force the body has. This has an electrical component. The life force can be suppressed or obstructed. This is the SOC index in the Biofeedback device software.

The Biofeedback device and Nelson medicine is based on a different treatment from allopathy. In Nelson medicine the flow of treatment is as follows:

1. Reduce or remove the cause of disease reduce the SOC index
2. Try to repair the damaged organs resulting from the disease
3. Unblock the blockages to flow of energy in the body. Chiropractic, Acupuncture, and other medical arts are dedicated to unblocking unbalances of flow.
4. Reduce the symptoms with natural methods and naturopathy
5. Deal with the constitutional make up or tendencies of the patient

The Biofeedback medical device is a Biofeedback / TENS device. Thus it is designed to stimulate conscious awareness of our unconscious processes. Our unconscious is aware of the initial interference in flow. And as such we all need to start our healing process with an interface with our unconscious awareness. This is the reason for the design of the Biofeedback device.

Then with the TENS capacity of the Biofeedback device we can use a cybernetic link to deal with the causes of disease. The device can zap pathogens, make aware nutritional problems, stimulate repair of injury, stimulate detox, desensitize allergies, reduce stress, and more.

But the best use of the device is its use for unblocking the blocks in flow. The Biofeedback device can detect faults in the acupuncture meridian flow and correct them. It can find faults in the energetic make up and correct them. It can find faults in the brain wave and correct them as well.

Finally the system can help in finding ways to reduce symptoms thru other naturopathic means.

So the primary goal of our system is to stimulate the body to heal itself. Symptom reduction is the third priority. We try to prevent the disease from slipping further. We want true healing and long term symptom reduction.

Some patients are more aware of their unconscious. These patients are likely to feel the Biofeedback device and recognize the reaction patterns more easily. Others will take more time, but after several visits they will become more aware of their unconscious and feel the effects more.

Perhaps you are intrigued by our new form of medicine, perhaps you are involved with this kind of path already. Let me now propose a contract. Let us agree that...
if you will acknowledge your own responsibility for your healing of your body, and make changes on your SOC index by reducing the blockages to disease, we at QX ltd will make every effort to try to make our device as safe, subtle, and effective a healing device as possible.

If you and your therapist will agree on a series of visits and a path of recovery that realizes that you did not get sick in a day, but over a long period of time. Gentle long term healing and health can be yours as you and your unconscious merge to one force of healing working for your well-being.

If you will work on your health and be patient with your unconscious, we will work together for wellness.

Responsibility changes for the patient.

____________________________________________________________
____________________________________________________________
____________________________________________________________
____________________________________________________________
____________________________________________________________
____________________________________________________________
____________________________________________________________
____________________________________________________________

Patient_______________________                      Prof. William Nelson

William Nelson
LIFESTYLE diseases are likely to kill increasing numbers of Pacific Islanders in the next ten years, the World Health Organization says.

WHO South Pacific Representative Doctor Ken Chen said there would be many deaths if efforts are not made to change lifestyles.

He made the comments while announcing that the Pacific Food Summit would be held in Vanuatu from April 21 to 23.

Dr Ken said the message was simple - eat locally produced foods and reduce salt and sugar intake.

Figures show that more than 50 per cent of adults in most Pacific countries were overweight and the percentage in some of these countries were the highest in the world.

The rate of diabetes is as high as 40 per cent and less than 20 per cent of adults in the Pacific consumed five or more serves of fruits and vegetables daily.

Dr Ken said the Pacific had moved away from traditional diets of root crops to rice and noodles.

This was caused by urbanization and economic factors.

Meanwhile, Fiji will be the first regional country to conduct the second National Non-communicable Disease STEPS survey this year. The first was in 2002.

The survey will help re-determine the NCD status of the population between the ages of 25 and 65.
Worrying about the surging problems related to poor diets and physical sluggishness, the World Health Organization put forwards to design new policies for the north Pacific.

“Delegates will discuss how to develop national nutrition policies dealing with the marketing of food and non-alcoholic drinks, the consumption of salt and tobacco use”, said Dr. Chen Ken, a WHO representative from the South Pacific.

He added that after framing a policy, they would seek assistance from the Governments and would also contemplate over how to apply the action publicly in different countries.

Moving ahead with its efforts, WHO is going to arrange a workshop in Guam this week from September 20-24 that aims at creating awareness among the inhabitants of Pacific island countries to check their health lifestyles.

As per WHO, the Pacific countries are threatened with disorders like cardiovascular disease, diabetes, cancer and chronic respiratory disease and these all are associated with unhealthy diet, physical idleness, tobacco use and consumption of alcohol.

The region has as many as 2.4 million people, who are facing the severe of the diseases and around 75% in this area are caused due to unhealthy lifestyle.

Around 73% of the people of Federated States of Micronesia aged 25 to 64 are overweight and nearly 42% are obese, as surveyed by WHO.
Drugs

Iatrogenic Disease

The history of medicine starts with the history of natural medicine. For eons medicine was natural. Over two hundred years ago medicines were mostly natural. Then came the synthetic revolution. Patents were available only for synthetic medicines. Patents allowed for control of the market to recoup the early investment in research and for the originality of an idea’s form. The history of the drug companies is of greed and side effects.

The greed of people drove all to use patented medicines and the press looked for each new wonder drug story. But as time went by each wonder drug had more negative side effects than positive remedies. Thousands of patented medicines are withdrawn from the market when the negative effects are brought out. But greed drives on. Profits from patents accelerate.

There is an average of over a trillion dollars of synthetic drugs sold each year, and an average of over 500 billion sought in damages from their sale in law suits directed at the drug company manufacturers. These synthetic drugs are insults to the body and they produce side effects. As greed drives up the sale of synthetic drugs, the iatrogenic disease they cause goes up.
Major Causes of Death 1955

Cancer
Heart
Medicine

Major Death Categories 1985

Cancer
Heart
Iatrogenic
Conventional Medicine
Our Society has All Learned to Avoid Synthetic Foods

- ADD
- Hives
- Eczema
- Autism
- Headaches
- PDD
- Ear Infections
- Irritability
- Asthma
- Dyslexia

Deaths from:
- Cancer
- Heart Disease
- Conventional Medicine

Cancer mostly from Tobacco
Conventional Medicine No 1 Killer
Heart Disease from Bad Diet and Big Sugar

2009
The Patent Medicine is Only SINthetic

You Can't Patent Nature
An enormous number of drugs have been made available by scientific research. They make a substantial contribution to our well-being. We can treat the majority of diseases, sometimes fully healing, sometimes alleviating their symptoms and their progress. Drugs enable to abolish physical pain and undergo surgical procedures, to replace missing or defective body functions and restore a normal life for people that would otherwise live a short and uncomfortable time.

The great number of easily available drugs puts, however, a definite risk of drug abuse. Even when properly used under careful medical guidance, drugs entail some risks anyway: contraindications, side effects, unexpected reactions. We must be aware that, whenever we take a drug, we are taking a chance for risk, which is balanced by the expected benefits. Summing up costs and benefits, drugs are an extraordinary resource we cannot do without.

The role of chemists is central in discovery and development of new drugs.
There are **natural drugs** and **synthetic drugs**. As seen in the figure, 41% of all new drugs that have been cleared for use from 1983 to 1994, are related in some way to natural sources.
If We See SYNTHETIC foods on the Menu, We Won't order them
Table Of Iatrogenic Deaths In The United States
(Deaths induced inadvertently by a physician or surgeon or by medical treatment or diagnostic procedures)

<table>
<thead>
<tr>
<th>Condition</th>
<th>Deaths</th>
<th>Cost</th>
<th>Author</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adverse Drug Reactions</td>
<td>106,000</td>
<td>$12 billion</td>
<td>Lazarou (1), Suh (43)</td>
</tr>
<tr>
<td>Medical error</td>
<td>96,000</td>
<td>$2 billion</td>
<td>IOM (3)</td>
</tr>
<tr>
<td>Bedsores</td>
<td>115,000</td>
<td>$55 billion</td>
<td>Xekeliss (7), Barczak (6)</td>
</tr>
<tr>
<td>Infection</td>
<td>88,000</td>
<td>$5 billion</td>
<td>Weinstein (9), MMWR (10)</td>
</tr>
<tr>
<td>Malnutrition</td>
<td>108,800</td>
<td>—</td>
<td>Nurses Coalition (11)</td>
</tr>
<tr>
<td>Outpatients</td>
<td>199,000</td>
<td>$77 billion</td>
<td>Starfield (12), Weingart (1, 12)</td>
</tr>
<tr>
<td>Unnecessary Procedures</td>
<td>37,136</td>
<td>$122 billion</td>
<td>HCUP (2), (12)</td>
</tr>
<tr>
<td>Surgery-Related</td>
<td>32,000</td>
<td>$9 billion</td>
<td>AHRO(13)</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td>783,936</td>
<td>$282 billion</td>
<td></td>
</tr>
</tbody>
</table>

We could have an even higher death rate by using Dr. Lucien Leape’s 1997 medical and drug error rate of 3 million (14). Multiplied by the fatality rate of 14 percent (that Leape used in 1994 (15) we arrive at an annual death rate of 420,000 for drug errors and medical errors combined. If we put this number in place of Lazarou’s 106,000 drug errors and the Institute of Medicine’s (IOM) 90,000 medical errors, we could add another 216,000 deaths making a total of 969,936 deaths annually.

Projected Ten-Year Death Rates For Medical Intervention

<table>
<thead>
<tr>
<th>Condition</th>
<th>10-Year Deaths</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adverse Drug Reaction</td>
<td>1.06 million</td>
</tr>
<tr>
<td>Medical error</td>
<td>0.98 million</td>
</tr>
<tr>
<td>Bedsores</td>
<td>1.15 million</td>
</tr>
<tr>
<td>Nosocomial Infection</td>
<td>0.88 million</td>
</tr>
<tr>
<td>Malnutrition</td>
<td>1.09 million</td>
</tr>
<tr>
<td>Outpatients</td>
<td>1.99 million</td>
</tr>
<tr>
<td>Unnecessary Procedures</td>
<td>371,360</td>
</tr>
<tr>
<td>Surgery-related</td>
<td>320,000</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td>7,841,360 (7.8 million)</td>
</tr>
</tbody>
</table>
IATROGENIC DEATHS:
(Med Doctor Caused)
America's Dark Secret -
Leading Cause of Death
In USA is Not Auto, Not
Heart Or Not Cancer

"No Dr. Kevorkian did not make out the menu
the SINthetic food people did"

We Must Stop Prescription
Drug Addiction
But the Hospital Menu does not Offer a choice You must Choose SINthetic
People Should be free to Chose Natural Medicine

NATURAL MEDICINE
SAFE & EFFECTIVE

Large Natural Pharmacy • Health & Nutrition Store
Botanical Medicine • Homeopathy • Acupuncture
Food Sensitivity Testing • Bowen Treatments
Weight Loss • B12 Injections • Onsite Lab
Walk in Clinic with Naturopathic Doctors on Staff
SATURDAY, Sept. 25 (HealthDay News) -- Children in the United States are not drinking as much water as they should, and the deficiency can have far-reaching implications, a new study suggests.

"Even mild dehydration can affect physiological function, and cause fatigue, muscle weakness, headaches and dry mouth," said Samantha Heller, clinical nutrition coordinator at the Center for Cancer Care at Griffin Hospital in Derby, Conn., who was not involved in the study.

Impaired cognitive and mental performance are also linked to inadequate hydration, said Heller.

According to the study, published in the October issue of the *American Journal of Clinical Nutrition*, only 15 to 60 percent of boys and 10 to 54 percent of girls, depending on age, drink the minimum amount of water recommended by the U.S. Institute of Medicine.

Children obtain much of their water from sweetened beverages rather than plain old H2O, the researchers found. And those who drink the most plain water consume fewer sweetened beverages and eat fewer high-calorie foods.

For the study, Ashima K. Kant from Queens College of the City University of New York and Barry I. Graubard of the U.S. National Cancer Institute looked at the water intake of 3,978 boys and girls, aged 2 to 19 years, who had been included in a national nutrition study from 2005 to 2006.

Included in their analysis was water itself, water in moist foods, and moisture in all beverages and nutritious drinks such as milk and juice.

The investigators found that water intake from all sources varied by age: 2- to 5-year-olds drank 5.9 cups a day; 6- to 11-year-olds got 6.8 cups, and 12- to 19-year-olds consumed 10.1 cups daily. Girls generally drank less than boys, Kant and Graubard noted.

Kids of all ages are more likely to drink beverages than water at mealtime, the findings suggest. More than two-thirds of water consumption was derived from beverages with main meals, while only one-third of the plain water was consumed with meals, the researchers found.

"Our results suggest age differences in the extent of water contributed by different sources to the diets of American children," the study authors wrote. "The quality of food selections reported in association with plain water intake was better than that reported with increasing beverage moisture, and the strength of these associations varied with age," they added.

"Efforts to moderate the consumption of sweetened beverages and promote plain water intake should not only continue to promote plain water for snacks but also should recognize the importance of replacing nonnutritive beverages at meal time with plain water," Kant and Graubard concluded.

As the children got older, consumption of plain water increased while intake of nutritive beverages, such as milk, decreased, the researchers found.

Water makes up 55 to 75 percent of total body weight, said Heller. "We cannot live without water for more than a few days because our bodies cannot store water. Thus, it is essential we replace the water our bodies lose every day."

Heller, a nutritionist and dietitian, advises starting children on water early.

"Give them water instead of sweetened beverages during the day and between meals," she said. To make it more appealing, put sliced cucumbers, oranges, lemons or strawberries in ice water, she suggested.

And if your child is hooked on sodas, she advised transitioning to seltzer or flavored seltzers instead.
Our world is awash in a rising tide of obesity, high blood pressure, heart disease and associated metabolic diseases such as diabetes. These chronic conditions place a heavy emotional toll on individuals and a financial burden on national healthcare systems across the globe. But how did this happen? How did diseases, which were hardly known 200 years ago, come to afflict nearly every family?

Science tells us that human genetics have not significantly changed over the last 200 years, but our ‘lifestyles’ have. By lifestyle we mean basic personal behaviors that influence health—diet, exercise, sleeping habits and substance use (including nicotine, alcohol), and our stress-management styles among others. Our personal choices are powerful ‘medicine’. To understand how lifestyle can influence our health, let’s examine a few common health problems.

Obesity: a gross concern

We start with obesity, since it often precedes other common medical problems. Fit to fat Two generations ago, most people were struggling just to get enough food to survive. They burned thousands of calories toiling for long hours in their farms or in physically demanding conditions as miners, loggers. However, the industrialisation of farming and mechanisation of industry has made food plentiful and physical labour less of a daily necessity. Now, we eat more and move less.

As a result, we continue to grow around the waistline. Over the last 50 years, in America alone, the consumption of sugar has increased by 39 per cent, salt by 100 per cent, meat by 70 per cent, and dairy by 400 per cent for an average of 3,700 more calories per person per week. As a result, the average American is much heavier now than he was in the 1900s. And this phenomenon is not restricted to America alone; more than 1 billion people worldwide are now overweight.

Problem with fat

Now the problem with extra weight or fat is not that it sits and jiggles, but rather that it remains metabolically active. This means that fat cells—in particular belly fat or visceral fat cells—release hormones. These hormones

Your Lifestyle
Your best medicine

The lifestyle choices we make are the root cause of our physical and emotional problems. They are also the solution to them.
In turn, a more plant-based diet, and improved mental/emotional poise, aid digestion, promote cellular health and reduce excess acid build-up.

By living a moderate life, we can eliminate many of the associated health risks.

There are also many treatments both medical and ayurvedic, which can help if simple changes are insufficient.

Listen to your body and make a plan to be your best!
and the avoidance of addictive and/or toxic substances. There are many other sub-categories, which could be addressed, but these are foundational in our model of lifestyle medicine.

**The food we eat**

Diet is a hotly debated lifestyle modality. It’s easy to see why. Most of us eat 2 – 10 times per day. And during that time, we make hundreds of choices about our foods including what to eat, how much to eat, when to eat it, when to stop and so on.

People have a very personal connection to food on many levels including nutritional, emotional and cultural. We believe that a healthy diet can have several variations but the central theme is the same.

A large percentage of our daily calories should come from whole grains, nuts, beans, fruits and vegetables and a smaller proportion from refined flour, sugar and animal products. Studies across the globe have shown that individuals, who consume such a diet, reduce their burden of disease and improve their quality of life.

**How well we sleep**

Disordered sleep can play havoc with your health. During a healthy sleep cycle, our body releases hormones to accelerate healing. These include melatonin, certain steroid hormones and growth hormone. Our body also reduces inflammation, and oxidation at the cellular level while double checking any and all new cells formed during that time. The chemical and cellular shift, which occurs at night, is crucial to keeping our cells healthy.

During rest, the body is able to focus its energy on healing damaged tissue and compensating for the wear and tear of daily life. In fact, recent studies report that insufficient sleep increases the risk of several common cancers including breast cancer. So to stay healthy, a restful night of sleep is imperative.

**The exercise we get**

Physical activity is another key component of a healthy lifestyle. Research shows that moving our bodies regularly has all kinds of benefits; from lowering the risk of diabetes and heart disease to improving mood and enhancing libido.

Check with your doctors before starting an exercise routine. Once cleared, we recommend that you try to get 150 minutes per week of moderate intensity physical activity [such as a brisk walk] and add a couple of sessions of resistance strength training.

No one is the same, and while some people love running, going to the gym or yoga, others hate it. In recognition of the social, cultural and personal norms of each person, we encourage you to find something you enjoy doing that is feasible in your life. We believe a little activity is better than none and daily is better than weekly.

It is also never too late to “get off the couch and into the game” as we say in America. Exercise has dramatic benefits for the teenager, the busy executive and the mature grandparent equally.

**The stress we take**

Do you feel stressed? Perhaps we should re-state that ...who doesn’t feel stressed? Stress is an age-old response to perceived threat. It is tightly linked to our sympathetic nervous system, which helps trigger appropriate fear in ‘fight or flight’ situations. In the past, if a tiger was about to pounce on you, the increased heart rate, wide open eyes, chill of fear down your back, helped you move faster and possibly survive. Unfortunately, we have a similar fight or flight response to daily stress in our families, our jobs, on the roads, or in many other common experiences.

This leaves us in a chronically stimulated and stressed state, which in turn slows down digestion, disturbs metabolism, increases fat storage, promotes...
lifestyle we have discussed either support or undermine our emotional health. In turn, our emotions can influence our personal behaviours. Let’s look at some examples.

When we are feeling depressed or anxious, we are more likely to reach for ‘comfort foods’ with lots of fats, sugars and excess calories. These foods increase the release of the ‘happy hormone,’ dopamine in the brain for a short time, which encourages us to eat more unhealthy foods. If we don’t break the cycle quickly, our unhealthy habits make us feel fatigued and unhealthy. We have less energy, put on more weight and then we reach for more unhealthy foods because we feel depressed or anxious. And so the cycle continues.

Likewise, when we are emotionally unbalanced we are less likely to exercise. Yet, exercise is exactly what we need. Exercise has been shown to be as effective as anti-depressants for mild depression and anxiety, with even longer-lasting effects. Our diet is also powerful. Eating a diet rich in micronutrients, and healthy proteins provides our cells with the building blocks to make plenty of neurotransmitters including dopamine, serotonin and norepinephrine, which help keep us balanced and happy.

The relationships we build

Now, very few of us can sustain great habits on our own. For this reason, surrounding ourselves with friends and family members who support our healthy behaviours is important. Healthy relationships in which we feel loved, supported, respected and appreciated are integral to our health. Get out of bad relationships and avoid negativity whenever possible. The ‘happy heart’ complements and inspires the healthy body. We have more power in being happy than we realise. How you set up your day, negotiate your relationships, hyperacidity, accelerates ageing, increases cancer risk and leads to other unwanted disease patterns.

Since our world doesn’t show signs of becoming less stressed, it’s up to us to develop strategies to cope and balance the stress. Spending time developing supportive relationships, engaging in calming behaviours, and developing healthy responses and resilience to stress is key. For example, if you know you might have a long work day, you can schedule short meditation breaks instead of coffee breaks; schedule a mid-day walk, or perhaps a few minutes of laughter yoga with friends around the lunch hour. Perhaps you can learn some breathing exercises to complete at your desk, or if traffic always stresses you, can you choose a different time or route to travel? Simple, thoughtful changes can help reduce stress and promote health. Start today.

The emotions we feel

Effectively managing your stress levels is key to promoting healthy emotions. In fact, the elements of a healthy lifestyle we have discussed either support or undermine our emotional health. When we are feeling depressed or anxious, we are more likely to reach for ‘comfort foods’ with lots of fats, sugars and excess calories.

The foods increase the release of the ‘happy hormone,’ dopamine in the brain for a short time, which encourages us to eat more unhealthy foods. If we don’t break the cycle quickly, our unhealthy habits make us feel fatigued and unhealthy. We have less energy, put on more weight and then we reach for more unhealthy foods because we feel depressed or anxious. And so the cycle continues.

Likewise, when we are emotionally unbalanced we are less likely to exercise. Yet, exercise is exactly what we need. Exercise has been shown to be as effective as anti-depressants for mild depression and anxiety, with even longer-lasting effects. Our diet is also powerful. Eating a diet rich in micronutrients, and healthy proteins provides our cells with the building blocks to make plenty of neurotransmitters including dopamine, serotonin and norepinephrine, which help keep us balanced and happy.

The relationships we build

Now, very few of us can sustain great habits on our own. For this reason, surrounding ourselves with friends and family members who support our healthy behaviours is important. Healthy relationships in which we feel loved, supported, respected and appreciated are integral to our health. Get out of bad relationships and avoid negativity whenever possible. The ‘happy heart’ complements and inspires the healthy body. We have more power in being happy than we realise. How you set up your day, negotiate your relationships,
Our personal choices are powerful ‘medicine’

The World Health Organization estimates that, “by 2020 two-thirds of the global burden of disease will be attributable to chronic non-communicable diseases, most of them strongly associated with lifestyle.” To know more about Lifestyle Medicine, visit www.harvardlifestylemedicine.org

The stuff we cling to

Finally, the non-food substances we eat, smoke or inject can have very powerful effect on our body and mind.

Nicotine is a potent vaso-constrictor, which means it makes blood vessels small and reduces blood flow to the skin and other important organs. By doing so, it slows healing and accelerates aging.

Most commercial nicotine products also have toxic chemicals added during processing, which cause problems of their own. Other addictive drugs such as cocaine, marijuana and heroin are even worse for your body and mind on many levels. Some drug-like substances such as alcohol and caffeine can have both good and bad effects depending on how much you use. We encourage limiting their consumption to small amounts and only occasionally, as they can easily lead to abuse and dependence.

Putting the pieces together

So how do you put all the pieces of a healthy lifestyle together? First ask yourself: Am I happy with my health today? Am I creating good health for the future? Are there ways I could be healthier? Next go through the list. Are you eating: nutrient dense/fibre-rich foods or processed, high calorie, low nutrient foods? Are you getting regular physical activity? Do you get sufficient sleep and awaken rested and restored? Do you let stress run your life or are you able to manage your stressors? Do you use any toxic substances like: nicotine, betel nuts, heroin, marijuana, cocaine, or use excess alcohol or caffeine?

Once you have determined where you can improve, then it’s time to set goals and make a plan. We encourage you to make SMART goals. SMART stands for goals that are specific, measurable, attainable, realistic and timely. This means your goal shouldn’t be, “I will get more exercise.” Instead, it should be “I am going to walk for 30 minutes during lunch with my co-worker on Mondays, Wednesdays and Fridays.”

With the second approach you know exactly what you are going to do, so you can monitor your progress and change your plan if it is not effective. Use the SMART approach when planning all your lifestyle changes.

You can do it!

The best part about lifestyle medicine is that anyone can apply it to his/her life, anytime and anywhere. No matter how old or how young you are, where you live or what work you do, simple intentional changes can have a dramatic effect on your health today and in the years to come. So we invite you to embrace change, advance your health, experience a healthier, happier tomorrow and lead a vibrant life!
LIFESTYLE MEDICINE – EVIDENCE REVIEW

I Definitions and differentiation of LM and related disciplines 2
II Reimbursement trends 6
III The Current Status of Lifestyle Medicine 8
IV Evidence for Lifestyle Interventions – Treating Chronic Disease 14
V Practice Patterns Related to Lifestyle Medicine 43
VI The Need for Competence in Lifestyle Medicine 44
VII Organizations and Initiatives 46
VIII References 49

Appendix: Evidence Chart 70

June 30, 2009
American College of Preventive Medicine
LIFESTYLE MEDICINE – EVIDENCE REVIEW

I. DEFINITIONS AND DIFFERENTIATION

A. DEFINITIONS OF LIFESTYLE MEDICINE
There doesn’t seem to be a standard definition, but the available definitions are really saying basically the same thing: The use of lifestyle interventions within conventional medicine to lower the risk for a number of lifestyle-related chronic diseases or, if such conditions are already present, to serve as an adjunct to the management plan.

Current definitions include:
Egger, 2008:
- The therapeutic use of lifestyle interventions in the management of disease at all levels to help manage the growing number of cases presenting to doctors now with a lifestyle-based cause of disease such as obesity and type 2 diabetes.
- The application of environmental, behavioral, medical and motivational principles to the management of lifestyle related health problems in a clinical setting.

ACLM:
- The use of lifestyle interventions in the treatment and management of disease.

ALMA:
- The therapeutic use of lifestyle interventions in the management of disease caused primarily by lifestyle.

Rippe, 1999:
- The integration of lifestyle practices into conventional medicine to lower the risk for chronic disease and, if disease is already present, to serve as an adjunct to therapy.

Rippe Health:
- The study and practice of how to help individuals understand that their daily habits and practices have a profound impact on their short and long term health and quality of life.

ACPM, Johnson, Barry, 2008:
- A defined scientific approach to decreasing disease risk and illness burden by utilizing lifestyle interventions such as nutrition, physical activity, stress reduction, smoking cessation, avoidance of alcohol abuse, and rest.

Greenstone, 2007:
- The study and practice of how simple lifestyle measures such as proper diet, proper exercise, and stress reduction are thoughtfully and comprehensively integrated into conventional Western medicine practices; includes promoting health through prevention and therapeutic strategies.

Additional descriptions:
- Bridges the gap between health promotion and conventional medicine. [ALMA]
- Includes primary prevention, secondary prevention and tertiary prevention. [Egger, ALMA]
- An essential component of the treatment of most chronic diseases; incorporated in many national disease management guidelines. [Rippe, 1999]
- A clinical discipline which involves general practitioners working with a team of allied health professionals to develop a patient specific intervention. [Egger]
- Involves a range of health professionals working as a team to prevent, manage and treat the ~70% of modern health problems which have a lifestyle-based cause. [ALMA]
- Brings together sound scientific evidence from diverse health related fields to assist clinicians in the process of not only treating disease, but also promoting good health. [Rippe, 1999]
- Requires patients to change high risk health behaviors to behaviors that will help to reverse the pathology and or reduce the likelihood of disease progression. [Egger]
- Changes the emphasis to an approach in which the patient becomes increasingly involved in his or her care. [ALMA]
- Isn’t simply about prolonging life, it’s about ensuring people can enjoy their later years with less pain and disease. [Rippe Health]
Interventions included:

- Nutrition, physical activity, stress management, sleep management, smoking cessation, personal hygiene and a variety of other non-drug modalities [Egger, 2008]
- Diet (nutrition), exercise, stress management, smoking cessation, and a variety of other non-drug modalities. [ACLM]
- Coaching patients to improve personal lifestyle choices regarding weight, physical activity/exercise, nutrition, smoking, stress management, and depression management. [Harvard ILM]
- Protocols and advice about physical activity, diet and nutrition, stress management, smoking cessation and other modalities related to lifestyle decisions and habits. [Rippe, 1999]

Trends:

- Becoming the preferred modality for not only prevention but also treatment of most chronic diseases, including type 2 diabetes, CHD, hypertension, obesity, insulin resistance syndrome, osteoporosis, and many types of cancer. [ACLM]
- Is often prescribed in conjunction with pharmacotherapy, e.g., diabetic patients on medication to control the blood glucose levels prescribed a diet and exercise intervention to assist in the long term management. [Egger]

ACLM [American College of Lifestyle Medicine]  [http://www.lifestylemedicine.org
ALMA [Australian Lifestyle Medicine Association]  [http://www.lifestylemedicine.net.au]
http://www.lifestylemedicineinitiative.com/what_is_lifestyle_medicine.php
Harvard Institute of Lifestyle Medicine  [http://www.institutelifestylemedicine.net/home.html
Rippe Health, James Rippe: in press release dated 12-5-08 about Orlando Health partnering with the University of Central Florida (UCF) Center for Lifestyle Medicine and renowned cardiologist, James M. Rippe, MD to become the first hospital in America to create a lifestyle medicine department and integrate it into patient care and resident education.
ACPM, Johnson M, Barry M. ACPM Lifestyle Medicine Initiative description, Sept 2008

B. COMPARISON WITH OTHER NONTRADITIONAL TYPES OF MEDICINE

Lifestyle Medicine is based on the recognition of the central role of lifestyle in many chronic disease conditions; the use of lifestyle change interventions within conventional medicine to lower the risk for chronic disease or, if disease is already present, to serve as an adjunct to the management plan.

- Includes exercise, eating habits, stress management, tobacco and alcohol use

Complementary Alternative Medicine (CAM) is a group of diverse medical and health care systems, practices, and products that are not presently considered to be part of conventional medicine. [NCCAM]

- These practices are not typically taught in medical school, not used in hospitals and not reimbursed by medical insurance
- The list of what is considered to be CAM changes continually, as those therapies that are proven to be safe and effective become adopted into conventional health care and as new approaches to health care emerge.

Complementary Medicine is used with conventional medicine. [NCCAM]

- An example of a complementary therapy is using aromatherapy - a therapy in which the scent of essential oils from flowers, herbs, and trees is inhaled to promote health and well-being to help lessen a patient's discomfort following surgery.

Alternative Medicine is used in place of conventional medicine. [NCCAM]

- An example of an alternative therapy is using a special diet to treat cancer instead of undergoing surgery, radiation, or chemotherapy that has been recommended by a conventional doctor.
Types of alternative medicine include: 1) Alternative medical systems (e.g., traditional Chinese medicine, acupuncture, homeopathy, naturopathy, ayurveda), 2) Mind/Body techniques (e.g., meditation, biofeedback, relaxation, hypnotherapy), 3) Biologically based therapies (e.g., herbal therapies), 4) Body based therapies (e.g., chiropractic, massage, reflexology), and 5) Energy therapies (e.g., reiki, therapeutic touch).

**Mind Body Medicine** focuses on the interactions among the brain, mind, body, and behavior, and on the powerful ways in which emotional, mental, social, spiritual, and behavioral factors can directly affect health. [NCCAM]

- It regards as fundamental an approach that respects and enhances each person's capacity for self-knowledge and self-care, and it emphasizes techniques that are grounded in this approach.
- Includes relaxation, hypnosis, visual imagery, meditation, yoga, biofeedback, tai chi, spirituality, etc

**Integrative Medicine** combines treatments from conventional medicine and CAM for which there is some high-quality evidence of safety and effectiveness. It is also called integrated medicine. [NCCAM]

- Many health care institutions have begun integrating therapies that aren't part of mainstream medicine into their treatment programs. A number of medical schools now include education on nontraditional techniques. As complementary and alternative therapies prove effective, they're being combined more often with conventional care. This is known as integrative medicine.

References:
NCCAM: http://nccam.nih.gov/health/whatiscam/overview.htm
Mayo Clinic: http://www.mayoclinic.com/print/alternative-medicine/PN00001/METHOD=print

**Preventive Medicine** includes all aspects of medical care aimed at preventing health problems; includes:
- Maintaining good health habits: daily exercise, weight control, proper nutrition, avoidance of smoking and drug abuse, abstinence from, or moderation of, alcohol use
- Proper control of any diseases or disorders, such as high blood pressure, diabetes, elevated cholesterol, e.g., monitoring, self-management skills, etc
- Periodic screening to prevent or at least minimize disease.
- Immunizations
- Early detection and intervention of disease processes

**Functional Medicine** is a patient-centered approach that goes beyond a typical holistic model to balance core functional processes in the body such as cellular metabolism, digestive function, detoxification, and control of oxidative stress. A combination of elements comes together in the functional medicine model:
- A thorough understanding of physiological and biochemical function, from cellular to organ levels;
- Knowledge of well-established interventions for altering gene expression; and
- An intensive study of the fundamental biological processes that can cut across organ systems and medical specialties.
- Produces a unique approach to health care that focuses on achieving health through optimizing physiological function.
http://www.carolinacenter.com/services.html

C. LIFESTYLE MEDICINE – COMPARE AND CONTRAST

Similarities to others:
- Similar to Complementary in that it is used with conventional medicine.
Similar to Alternative in that it can be an alternative treatment – as in the Ornish program for CAD, or a lifestyle approach to treating low back pain, hypertension, dyslipidemia, etc

Similar to Integrative in that there is evidence to support its use with conventional medicine for many conditions, and it is integrated into conventional medicine

Similar to Preventive in the attention to good health habits, the role of lifestyle behaviors in controlling disease, and the application to every person

Differences between LM approach and the others:

- Seems to fit between alternative medicine and conventional medicine
- It is more specific (i.e., prescriptive) in its use of lifestyle interventions
- Stronger evidence base than most alternative therapies
- Includes fewer treatment options; does not include the vast array of therapies that are used in alternative therapy
- It is not used in place of conventional medicine as is alternative medicine
- Some aspect of LM is almost always appropriate with conventional treatment
- LM does not include the screening, immunizations, and preventive medical therapies that are part of preventive medicine
- Better defined than integrative or functional medicine; the interventions that make up these approaches are not specified; these approaches seem more nebulous

Unique role of Lifestyle Medicine:

- Strict focus on lifestyle behaviors
- Success depends on patient motivation – must include “coaching”
- Name describes the approach better than any other type of non-conventional medicine
- Applies to every practice, every patient
- Emphasizes the use of a collaborative care model because of incorporation of allied health care professionals to provide much of the direct counseling
- Limited number of intervention approaches – more conducive to staff training
- Involves more prescriptive lifestyle interventions for specific diseases or risk conditions
- Recommended in many national guidelines for use in both prevention and treatment
- The inclusion of cognitive behavioral therapies in lifestyle change, motivational counseling, coaching patients to become more involved and responsible for their own outcomes

Questions:

- Application to primary prevention
- If not, where do you draw the line, as “pre-diabetes” or “pre-hypertension” or other high risk conditions?

D. DIFFERENCES BETWEEN CONVENTIONAL AND LIFESTYLE MEDICINE

<table>
<thead>
<tr>
<th>Conventional</th>
<th>Lifestyle</th>
</tr>
</thead>
<tbody>
<tr>
<td>Treats individual risk factors</td>
<td>Treats lifestyle causes</td>
</tr>
<tr>
<td>Patient is often passive recipient of care</td>
<td>Patient is active partner in care</td>
</tr>
<tr>
<td>Patient is not required to make big changes</td>
<td>Patient is required to make big changes</td>
</tr>
<tr>
<td>Treatment is often short term</td>
<td>Treatment is always long term</td>
</tr>
<tr>
<td>Responsibility falls mostly on the clinician</td>
<td>Responsibility falls mostly on the patient</td>
</tr>
<tr>
<td>Medication is often the “end” treatment</td>
<td>Medication may be needed but as an adjunct to lifestyle change</td>
</tr>
<tr>
<td>Emphasis is on diagnosis and prescription</td>
<td>Emphasis is on motivation and compliance</td>
</tr>
<tr>
<td>Goal is disease management</td>
<td>Goal is primary, secondary and tertiary disease prevention</td>
</tr>
<tr>
<td>Little consideration of the environment</td>
<td>Consideration of the environment</td>
</tr>
<tr>
<td>Side effects are balanced by the benefits</td>
<td>Side effects are seen as part of the outcome</td>
</tr>
<tr>
<td>Referral to other medical specialties</td>
<td>Referral to allied health professionals as well</td>
</tr>
<tr>
<td>Doctor generally operates independently on a one-to-one basis</td>
<td>Doctor is coordinator of a team of health professionals</td>
</tr>
</tbody>
</table>


American College of Preventive Medicine
II. REIMBURSEMENT TRENDS

A. THE BIG QUESTION – HOW TO MAKE IT REIMBURSEABLE?

CPT codes are already available for tobacco and alcohol counseling.

- Some CPT codes are available for physical activity, such as:
  - Pulmonary rehab exercise (4033F), therapeutic exercise for osteoarthritis (4018F), exercise counseling for osteoporosis (4019F), and cardiac rehab (93797).
  - Generally don’t include non-physician services.
- According to the AMA, codes are available for diet change and preventive counseling, but are seldom used and not reimbursed; can bill these services as part of extended visit for chronic disease
- No CPT codes for diet or stress management

The case needs to be made for specific lifestyle interventions (i.e., prescriptions for exercise, diet, stress, etc) for specific medical conditions (i.e., diagnoses) – so coverage can be defined.

- AMA is actively advocating for adequate compensation for health behavior counseling.


Use smoking as an example: Build the evidence base to make the case

Indisputable evidence has had an effect on coverage, has led to a greater frequency of identifying and discussing tobacco use, and providing interventions. [1]

- Smoking rates have dropped from about 44% in the 1960s to about 21% today. [2,3] Today, there are more former smokers than current smokers. [4]

In the dozen years since the publication of the first Guideline, impressive changes have occurred. [1]

- In 1997, only 25% of managed health care plans covered any tobacco dependence treatment – By 2003, this figure approached 90%. [5]
- Numerous states added Medicaid coverage for tobacco dependence treatment since the publication of the first Guideline so that, by 2005, 72% offered coverage for at least one Guideline-recommended treatment. [5–7]
- Finally, Medicare, the Veterans Health Administration, and the U.S. Military now provide coverage for tobacco dependence treatment. Such policies and systems changes are paying off in terms of increased rates of assessment and treatment of tobacco use.
- The rate at which smokers report being advised to quit smoking has approximately doubled since the early 1990s. [8–11]
- Recent data also suggest a substantial increase in the proportion of smokers receiving more intensive cessation interventions.[12,13]
- The National Committee for Quality Assurance (NCQA) reports steady increases for both commercial insurers and Medicaid in the discussion of both medications and strategies for smoking cessation.[14]
- Finally, since the first Guideline was published in 1996, smoking prevalence among adults in the United States has declined from about 25% to about 21%. [15]

The 2008 Guideline update emphasizes that clinicians and health care delivery systems consistently identify and document tobacco use status and treat every tobacco user seen in a health care setting.

- It also documents the considerable progress made in tobacco research over the brief period separating these two works.
- A key recommendation of the updated Guideline is that health care systems, insurers, and purchasers assist clinicians in making the established effective treatments available.
- Making tobacco dependence a benefit covered by insurance plans increases the likelihood that a tobacco user will receive treatment and quit successfully.

The fifth chapter of the updated guidelines (Systems Interventions), targets health care administrators, insurers, and purchasers, and offers a blueprint to changes in health care delivery and coverage such that tobacco assessment and intervention become a standard of care in health care delivery.

- The authors explain that changes in health policy make a difference in curbing smoking. Some helpful policy steps include:
Providing tobacco dependence treatment as a covered insurance benefit
Offering training to physicians and nurses to encourage them to counsel patients
Improving the ability of physicians to document and receive reimbursement for tobacco interventions.

The same thing needs to be done for: 1) exercise interventions, 2) diet interventions, and 3) stress management interventions.

- May need to break down evidence to specific evidence-based practices for diagnosed conditions, such as:
  - Exercise: Reduce time in sedentary activity, Walking 3x/week for 30 minutes,
  - Diet: Increase fiber consumption to 20 g/day, Reduce saturated fats to 10% of kcals
  - Stress: Use relaxation response for anxiety attacks

B. MEDICARE COVERAGE
http://www.medicare.gov/Coverage/Home.asp

Lifestyle Medicine covered:
It is a quite narrow range of indications:
- Cardiac rehab following an MI, heart surgery, or diagnosed stable angina for 3-4 mos
- Diabetes self management -- 10 hrs of self management training following the diagnosis
- Medical nutrition therapy for people with diabetes, kidney disease (not on dialysis), or have a kidney transplant.
- Smoking cessation if diagnosed with a smoking-related disease -- 8 visits over a 12-month period.
- Individual has to pay 20% of covered amount.

Medicare covers screening tests for cholesterol, lipid, and triglyceride levels every five years, BUT does not cover health and wellness education, OR alternative therapies.

CARDIAC REHAB
Effective March 22, 2006, Medicare covers comprehensive cardiac rehabilitation programs that include exercise, education, and counseling for patients referred by their doctor who meet one of the following conditions:
1. had a heart attack in the last 12 months,
2. had coronary bypass surgery,
3. have stable angina,
4. had heart valve repair/replacement,
5. had angioplasty or coronary stenting, or
6. had a heart or heart-lung transplant.

Program Requirements
- Duration: 2 to 3 sessions per week for 12 to 18 weeks.
- Components: Programs must be comprehensive, including a medical evaluation, a program to modify cardiac risk factors (e.g., nutritional counseling), prescribed exercise, education, and counseling.
- Facility: Must have the necessary cardio-pulmonary, emergency, diagnostic, and therapeutic life-saving equipment accepted by the medical community as medically necessary, e.g., oxygen, cardiopulmonary resuscitation equipment, or defibrillator.
- Staff: Must be under the direct supervision of a physician; personnel trained in both basic and advanced life support techniques and in exercise therapy for coronary disease.

DIABETES SELF MGMT
Includes education about self-monitoring of blood glucose, diet, exercise, and insulin.
- 10 hours of initial diabetes self-management training; may qualify for 2 hours of follow-up training each year if
  - it is provided in a group of 2 to 20 people,
  - it lasts for at least 30 minutes,
  - it takes place in a calendar year following the year you got your initial training, and
your doctor or a qualified non-physician practitioner ordered it as part of your plan of care.

MENTAL HEALTH
Medicare covers mental health services on an outpatient basis by a doctor, clinical psychologist, clinical social worker, clinical nurse specialist, or physician assistant in an office setting, clinic, or hospital outpatient department.

- Medicare covers substance abuse treatment in an outpatient treatment center if they have agreed to participate in the Medicare program; patients usually pay 50% of the Medicare-approved amount.

MEDICAL NUTRITION THERAPY
Medicare covers medical nutrition therapy services when it is ordered by a doctor for people:

- with kidney disease who are not on dialysis or
- who have a kidney transplant or
- who have diabetes.

Services can be given by a registered dietician or Medicare-approved nutrition professional and include nutritional assessment and counseling.

- Dietary foods, drinks and vitamins are not covered.

SMOKING CESSATION
People with Medicare who are diagnosed with a smoking-related disease, including heart disease, cerebrovascular disease (stroke), multiple cancers, lung disease, weak bones, blood clots, and cataracts can get coverage for smoking and tobacco use cessation counseling.

- Medicare will cover 8 face-to-face visits during a 12-month period. These visits must be ordered by your doctor and provided by a qualified doctor or other Medicare-recognized practitioner.

NOT COVERED
Medicare generally does not cover health and wellness education, OR alternative therapies.

III. CURRENT STATUS OF LIFESTYLE MEDICINE

An enormous body of evidence supports the effectiveness of lifestyle interventions for lowering the risk of developing chronic disease, as well as for assisting in the management of existing disease. As a result of the accumulating evidence, national guidelines emphasize lifestyle interventions for general health, as well as most disease or high risk conditions. [1-10]

The general consensus of these recommendations includes:

- Get about 30 minutes of moderately intense physical activity at least 5 days a week, preferably every day,
- Quit smoking, if a smoker,
- Use alcohol only in moderation, if at all - limit to 2 servings/day for men, 1 for women,
- Lose 5% to 10% of body weight, if overweight or obese,
- Achieve weight loss by reducing kcal intake by about 500 kcal per day and gradually increase physical activity to 60 minutes per day,
- Consume a diet rich in vegetables and fruits, at least 2 fruits, 3 vegetables per day,
- Choose whole-grain, high-fiber foods (at least half of grains as whole grains),
- Limit intake of saturated fat to <10% of energy, trans fat to <1% of energy, and cholesterol to <300 mg/day by choosing lean meats and vegetable alternatives, fat-free (skim) or low-fat (1% fat) dairy products and minimize intake of partially hydrogenated fats,
- Consume fish, especially oily fish, at least twice a week,
- Minimize intake of beverages and foods with added sugars.

Other recommendations, or some variations of these, are made for specific medical conditions, but there are two key points:
1) Healthy lifestyle behaviors are included in virtually every practice guideline for chronic disease prevention or management, and
2) Relatively small lifestyle improvements (e.g., 30 min of moderate exercise a day, 100 kcal reduction in daily intake, a weight loss of 5%) if maintained over time can reduce the risk of developing, as well as the progression of, chronic disease. [see evidence section]

The USPSTF recommends that clinicians screen all adult patients for obesity, tobacco use and alcohol use, and offer cessation interventions for smokers, and intensive counseling and behavioral interventions to promote sustained weight loss for obese, reduced alcohol consumption in excessive users, and diet changes for all who have hyperlipidemia or other known risk factors for cardiovascular and diet-related chronic disease. http://www.ahrq.gov/clinic/pocketgd08/pocketgd08.pdf
- USPSTF recommendations are notable in their lack of endorsement of behavioral counseling in primary care for physical activity or for dietary improvements in otherwise healthy people.
- They note the benefits of activity and a healthy diet, but the lack of RCT evidence precludes recommendations.

The Challenge
According to Greenstone, the challenge is no longer proving that lifestyle interventions work, but rather in enhancing clinicians’ and the health care system's commitment to learning how to incorporate the interventions into their practices and to deliver specific and compelling messages and strategies to patients. The risks of not changing must be clearly articulated, and a specific plan outlined. [11]

Physician Responsibility
According to the AMA Council on Scientific Affairs, health professionals have a key responsibility to:
- promote preventive measures and encourage positive lifestyle behaviors relating to obesity,
- counsel patients about safe and effective weight loss and weight maintenance programs, and
- identify and treat obesity-related co-morbidities. [12]

Several studies have demonstrated the enormous potential of physician recommendations to influence patients’ lifestyle behaviors, such as stopping smoking and improving diet. [13-18]

The primary care setting is a natural fit for lifestyle medicine. [19-21]
- PCPs manage the majority of patients with chronic conditions; see 3 out of 4 adults at least once a year; average is 2-3 times per year. [22]
- The public perceives physicians as extremely credible and reliable sources of information regarding health behaviors. [23,24]

Advice from a physician has consistently been shown to lead to attempts to improve lifestyle. [25-31]
- Powerful motivator to increase physical activity [33,41], or make a serious attempt to lose weight. [34-40]

Furthermore, some evidence suggests an association between physicians’ personal health behaviors and their counseling of lifestyle interventions
- Women Physicians’ Health Study was a Cross-sectional survey of 4501 female doctors
  • An early publication showed correlations between a physician’s personal health behaviors and her likelihood of counseling patients on lifestyle interventions related to that behavior. This held true, when controlling for other variables, for low fat consumption and cholesterol counseling, physical activity and exercise counseling, alcohol moderation and alcohol counseling and not smoking and smoking cessation counseling. Authors did not report odds ratios. [116]
  • It revealed an association between women physicians placing a high priority on exercising more and counseling patients on exercise at least once a year (OR 1.7). [117]
• It also revealed an association between a physician vegetarian diet and her counseling patients on weight loss and nutrition (OR 2.0 and 2.1, respectively) at least once a year. [118].
  - A cross sectional survey of 298 primary care physicians showed that doctors who exercised were more likely to counsel their patients to exercise. [119]
  - A cross section survey of 1349 internists showed that among men internists, personal health practices were associated with counseling patients for each behavior except alcohol use. Among women, high physical activity was associated with counseling more patients about exercise and alcohol use [120]

A particularly important time to encourage lifestyle change is after a cardiovascular event or upon the discovery of existing CVD or diagnosis of some other chronic disease. [42]
  - Unfortunately, physicians often underestimate the importance and power of their role as health behavior change counselors. [42]

A. PREVALENCE OF LIFESTYLE-RELATED CONDITIONS

The predominant lifestyle-related medical conditions seen in primary care include obesity, hypertension, dyslipidemia, diabetes, metabolic syndrome, cardiovascular disease, arthritis and osteoporosis.

- 2 out of 3 overweight or obese (1 in 3 obese) [43]
- 1 out of 2 with abdominal obesity (waist circumference ≥ 40" in men or ≥ 35" in women) [44]
- 1 in 3 with one or more types of CVD [45]
- 1 in 14 with CHD [7], 1 in 17 with PVD [46]
- 1 in 3 with hypertension (half over age 55, 2 in 3 over age 65); another 1 in 3 with pre-hypertension [47-49,49a]
- 1 in 4 with high “bad” cholesterol [50]
- 1 in 3 with low “good” cholesterol [51]
- 1 in 8 with diabetes (another 1 in 3 with pre-diabetes) [52]
- 1 in 3 with metabolic syndrome; approaching half over age 60 [53-55]
- 1 in 5 with arthritis; approaching half over age 55 [56-58]
- 1 in 5 women over 50 with osteoporosis [59]

Patient awareness and control are inadequate:
  - Fewer than half of women aware of healthy levels of risk factors for CVD. [60]
  - Nearly 1 in 3 hypertensives unaware, 2 in 5 not actively treated, and nearly 2 in 3 not adequately controlled. [49,61]
  - Between 1988-1994 and 1999-2004, awareness of high cholesterol increased from 39% to 63%, use of lipid-lowering drugs increased from 12% to 41%, LDL control among hyperlipidemics increased from 4% to 25% [62].
  - Less than half who should be treated for high LDL are being treated, only 1 in 3 of treated achieving goal level (1 in 5 with CHD) [63]
  - Pre-diabetes is seldom identified – only 1 in 100 told they have pre- or borderline diabetes [64]
  - Less than half with diagnosed diabetes achieving adequate control [65-67]
  - Fewer than 1 in 7 aware of the metabolic syndrome [68]

B. PREVALENCE OF LIFESTYLE-RELATED BEHAVIORS

Summary of adult lifestyle behaviors:
  - 1 in 5 smokes [69]
  - 2 in 5 exposed to second-hand smoke [70]
  - 3 in 4 do not get enough physical activity [71,72]
  - 4 in 5 need to significantly improve their diet [73-76]
  - 2 in 3 need to lose weight [77]
  - < 1 in 4 uses the recommended combination of caloric restriction and physical activity to lose weight. [78]
  - 1 in 3 exceeds the daily or weekly alcohol recommendation, 1 in 5 binge drinks at least occasionally. [79]
1 in 33 are at healthy weight, non-smoking, physically active and consume ≥ 5 fruits and vegetables per day [80].
1 in 3 adults 30 to 64 years old averages ≤ 6 hours of sleep per day. [81]

Few with multiple healthy behaviors:
In the 2000 BRFSS, only 1 in 33 (3%) had healthy levels of all 4 lifestyle behaviors (non smoking, healthy weight, 5 fruits and vegetables per day, and regular physical activity. [80]

Many with multiple CVD risk factors:
Greater than 1 in 3 adults had at least 2 major CVD risk factors in the 2003 BRFSS (36% of women, 38% of men, nearly half of blacks and American Indians/Alaska Natives). [82,83]

Diet Behaviors:
Between 1971 and 2002 caloric intake increased by 200 kcals in men, 330 in women; energy density of foods and energy intake per meal increased, frequency of breakfast declined. [84]
- Americans average 16 grams of fiber per day vs. the recommended 20-35 grams per day. [85]
- Few meet the guidelines for fruit (≥ 2 servings) and vegetable (≥ 3 servings) consumption; < 1 in 3 adults achieves the fruit recommendation and < 1 in 4 meets the vegetable standard. [86,87]
- Even fewer (1-2 in 10) achieves both standards on a regular basis. [86,88,89]
- Intake of added sugars (sucrose, corn syrup, and high-fructose corn syrup) increased from 13% of energy in 1978 to 17% in 2002. [90,91]
- Nearly 2 in 3 adults consumes sugar-sweetened beverages (SSB); per capita consumption has increased by 46 kcal/day (6 oz) from 1994-2004 [92].
- Only 1 in 6 adults 19-50, and 1 in 10 over 50, consume the recommended dairy servings per day. [93]
- 1 in 3 adults average < 1 whole-grain serving per day and only 1 in 12 consumes 3 or more. [94]
- From 1977 to 1996, food eaten away from home increased from 18% to 32% of calories. [95]
- Fewer than 1 in 5 older adults (≥ 60 yrs) consumed a “good” quality diet, based on intakes of fruit, vegetables, low fat dairy, total and saturated fat, whole grains, and lean protein. [96]
- Fewer than 1 in 5 hypertensive patients who were advised to follow the DASH diet were following it. [97]
- Only 1 in 2 people with diabetes were adhering to the ADA dietary recommendations for saturated fat and fiber. [98]

Physical Activity Behaviors
- About half are somewhat active but not enough to lower health risks, and 1 in 4 are completely sedentary. [72]
- 2 in 5 spend most of their working day sitting. [72]
- Total inactivity increases with age -- over 60% at age 75. [72]
- Over half over age 60 report no leisure time physical activity. [99]
- Only 1 in 6 adults have a high level of physical activity. [72]
- Data obtained with accelerometers (NHANES 2003-2004) showed even fewer adults (1 in 20) were actually achieving 30 min/day of physical activity. [100]

Even CVD patients are not taking advantage of lifestyle interventions:
Data from the Medical Expenditure Panel Survey (MEPS) 2004 showed that:
- Half (54%) not engaging in moderate physical activity 3 times per week,
- 2 out of 3 (66%) overweight,
- Nearly 1 in 5 (18%) continuing to smoke,
- Fewer than 1 in 5 (18%) engage in all 3 positive behaviors (active, non-smoking, at a healthy weight), and 1 in 15 (6.5%) are not engaging in any of the recommended behaviors.

C. IMPACT OF HEALTHY LIFESTYLE AND LOW RISK FACTOR LEVELS

Four main causes – excess weight, poor diet, physical inactivity, and smoking – account for most of the mortality and morbidity of the major diseases of modern society, including heart disease and stroke, diabetes, osteoarthritis, osteoporosis, colorectal cancer, depression, and kidney disease. [Egger, 2008, p 13]

- A number of studies have shown the benefits of a healthy lifestyle and lower CVD risk factor burden on CVD outcomes and longevity.

The Interheart Study, which analyzed more than 11,000 myocardial infarctions, showed that 8 factors -- abnormal lipids, smoking, hypertension, diabetes, abdominal obesity, inactivity, lack of consumption of fruits and vegetables, and alcohol -- accounted for more than 80% of the risk for an MI. [101]

The Chicago Heart Association Detection Project in Industry has followed people from a young age (18-39 yrs) for over 30 years. Key findings include:

- Incidence of CHD and CVD was rare in those with favorable levels of 5 major risk factors (BP, cholesterol, BMI, diabetes, and smoking) at a young age. [102]
- Mortality rates were much higher in those who had elevated risk factors in early adulthood. [103]
- Compared with participants with ≥ 3 risk factors, those with favorable profiles had substantially lower lifetime risks for CVD death (20% vs. 35% in men, 7% vs. 32% in women) and markedly longer median survival at middle age (>35 vs. 26 years in men, >35 vs. 28 years in women). [104]
- After age 60, the impact of the risk factor burden increases rapidly both men and women. [104]
- Lower risk factor burden in middle age was associated with better QOL at older ages, along with lower Medicare costs. [105]
- Having more risk factors at middle age was associated with poorer social functioning, mental health, walking ability, and health perception at older ages. [106]
- A key finding was that the CVD risk factor burden was an important prognostic indicator for other major diseases besides CVD; remaining lifetime risk for non-CVD death increased dramatically with increasing risk factor burden. [107]

The Framingham Heart Study has also shown that the lifetime risk for CVD, as well as longevity, is highly associated with risk factor burden at age 50. [108]

- Remaining lifetime risk for atherosclerotic CVD events was 5% in men and 8% in women with optimal risk factors at age 50, compared with 69% in men and 50% in women with ≥2 major risk factors at age 50. [108]
- Men and women with optimal risk factors had a median life expectancy 10 years longer than those with ≥2 major risk factors at age 50. [108]
- 36% of the cohort survived to age 85, 22% survived to that age free of major morbidities. [109]
- But, with adverse levels of 4 risk factors at middle age, fewer than 5% of men and 15% of women survived to 85 years of age. [109]

The Atherosclerosis Risk in Communities Study showed that >90% of CVD events in black subjects, and > 70% in white subjects, were explained by elevated risk factors. [110]

The Multiple Risk Factor Intervention Trial (MRFIT) Study and Chicago Heart Association Detection Project cohorts found that those with low risk factor status had a 73- 85% lower risk for CVD mortality, a 40-60% lower total mortality rate, and 6 to 10 years’ greater life expectancy than those who were not low risk status. [111]
The Nurses’ Health Study showed that with 3 of 5 healthy lifestyle factors, risk for CHD over a 14-year period was reduced by 57%; with 4, risk was reduced 66%; and with all 5 factors, risk was reduced by 83%. [112]

In the Health Professionals Follow-up Study, low risk was defined as (1) absence of smoking, (2) BMI <25 kg/m², (3) physical activity ≥30 min/d, (4) moderate alcohol consumption (5 to 30 g/d), and (5) top 40% of a healthy diet score.
- Over 16 years, men who met all 5 lifestyle factors had only 87% lower risk for CHD as men whose lifestyle achieved no lifestyle factors.
- 62% of coronary events in this cohort may have been prevented with better adherence to these 5 healthy lifestyle practices.
- Among men taking medication for hypertension or hypercholesterolemia, 57% of all coronary events may have been prevented with a low-risk lifestyle.
- Compared with men who did not make lifestyle changes during follow-up, those who adopted ≥2 additional low-risk lifestyle factors had a 27% lower risk of CHD.
- A majority of CHD events among US men may be preventable through adherence to healthy lifestyle practices, even among those taking medications for hypertension or hypercholesterolemia.

Among individuals 70-90 years of age, adherence to a Mediterranean-style diet and greater PA have been associated with 65% to 73% lower rates of all-cause mortality, as well as lower mortality rates due to CHD, CVD, and cancer. [113]

The NHANES II Mortality Follow-Up Study showed that, over 17 years, the risk for CHD mortality was 51% lower for men and 71% lower for women with none of 3 major risk factors (hypertension, smoking, and elevated total cholesterol) than for those with 1 or more risk factors. [114]
- They estimated that 64% of all CHD deaths among women and 45% of CHD deaths in men could have been avoided if these 3 risk factors were not present.

The need for early lifestyle intervention:
- Individuals with a low 10-year risk for CHD, but a high lifetime risk, have a greater subclinical disease burden and a greater rate of atherosclerotic progression than individuals with low 10-year and low lifetime risk, even at younger ages. [115]

D. BEHAVIORAL SCIENCE METHODS TO CHANGE RISK FACTORS

Physician discussion of healthy behaviors can be associated with behavior change.
- For instance, a cross sectional study revealed that patients whose doctors asked about diet were more likely to have changed fat or fiber intake (64% vs 48%). [121]

Improving patient care will likely require better patient education and use of behavioral science methods to influence patient behavior. [122]

Behavioral methods for lifestyle interventions may involve: patient assessment, setting goals, raising awareness, confronting barriers, managing stress, cognitive restructuring, Preventing relapse, providing support, contracting, and adding pharmacotherapy as appropriate. The 5A protocol is one such counseling framework: [123]
1. **Assess** current practices and related risk factors.
2. **Advise** what to change.
3. **Agree** on individual change goals.
4. **Assist** change strategies and motivational barriers.
5. **Arrange** regular follow-up and support or refer to specialists if needed.

Because patients could be in different stages of readiness [124], these counseling frameworks can help the clinician assess their readiness and adjust the counseling appropriately.
IV. EVIDENCE FOR LIFESTYLE INTERVENTIONS – TREATING CHRONIC DISEASE

Lifestyle interventions have the potential to improve the entire risk factor profile and most underlying causes of chronic conditions. For many, the diagnosed condition is only the tip of the iceberg. This is the great advantage of lifestyle medicine over conventional medical therapy.

Exercise and increasing physical activity are the foundation of lifestyle medicine based on supporting evidence.

- A systematic review of the benefits of exercise therapy in the treatment/rehabilitation of specific chronic disease found the most consistent finding to be that aerobic capacity and muscular strength can be improved without causing detrimental effects on disease progression. Severe complications are rare. [1]
- Unfortunately, treatment periods and follow-up times are often not long enough to document group differences in disease progression. However, exercise reduces disease-related symptoms in many diseases, such as osteoarthritis, asthma and chronic obstructive pulmonary disorder.
- Also, RCTs of patients with coronary heart disease and heart failure show that all-cause mortality is lower in exercisers than in controls.
- Quality of life and physical performance can be improved for many conditions.

The following diseases are addressed in this review:
A. Obesity
B. Hypertension
C. Dyslipidemia
D. Impaired Glucose Tolerance/Metabolic Syndrome
E. Type 2 Diabetes
F. Cardiovascular Disease
G. Stroke
H. Heart Failure
I. Peripheral Artery Disease
J. Chronic Obstructive Pulmonary Disease
K. Osteoarthritis
L. Rheumatoid arthritis
M. Cancer – All
N. Breast Cancer
O. Osteoporosis
P. Depression
Q. Fibromyalgia
R. Chronic Fatigue Syndrome
S. Type 1 diabetes
T. Non-alcoholic fatty liver disease
U. Multiple Sclerosis
V. Parkinson’s
W. Cognitive Impairment/Dementia
X. Chronic Low Back Pain

A. OBESITY
It is well established that obesity results from a chronic imbalance between caloric intake and expenditure. Reducing stored energy in fat cells requires creating a deficit by cutting calories consumed and increasing calories expended. Consumption is the key because it is much easier to cut calories than to expend calories.

Lifestyle Modification
A review of the evidence base of weight loss strategies showed that treatments with good evidence include counseling and behavioral approaches, exercise based programs, pre-prepared low energy
meals, meal replacement, and bariatric surgery (the most effective for long term weight loss in morbid obesity). [2]
- Limited data supports commercial diets and self help strategies.
- Over-the-counter medications or treatments (with the exception of orlistat) have no convincing evidence of efficacy.
- All successful strategies include some form of lifestyle change resulting in a reduction in energy consumed versus energy expended. The most effective treatments involve combining and matching strategies to the characteristics of the patient.

**Lifestyle Modification – All**
Intensive counseling can promote modest sustained weight loss.
- A Cochrane review of 32 longitudinal analyses and 17 RCTs showed that intensive counseling strategies incorporating behavioral, dietary, and exercise components resulted in a weight loss of 3 to 4 kg over 1 to 3.3 years. [3]
- The loss was linked with improved glucose tolerance, improved physical functioning, reduced incidence of diabetes, hypertension and CVD, and reduced bone density.

Another systematic review of the long-term effects of obesity treatments showed that low-fat diets were associated with continuing weight loss for 3 years and improvements in risk factors, as well as prevention of type 2 diabetes and improved control of hypertension. [4]
- The addition of an exercise or behavior program to diet was associated with improved weight loss and risk factors for at least 1 year.
- The combination of low-fat diets, exercise and behavior therapy reduced the risk of developing hypertension and CVD.

A third systematic review of RCTs of interventions for weight loss in obese found that adding exercise to diet, or to diet and behavior therapy, was associated with improved weight loss for up to 36 months and improvements in HDL, TGs and blood pressure. [5]
- Adding behavior therapy to diet, or to diet and sibutramine together, was associated with improved weight loss for up to 18 months.
- Adding drugs, exercise or behavior therapy to dietary advice was each associated with similar weight change.

**Lifestyle Modification – Women**
A 6-month lifestyle change intervention in obese, sedentary, postmenopausal women showed that women significantly increased their physical activity (+39.6%) and cardiorespiratory fitness (+13.5%) and reduced their body weight (-6.5%), fat mass (-7.4%), body fat (-2.4%), BP (SBP -6.2%, DBP -9.2%), total cholesterol (-7.4%), triglycerides (-16.5%), and low-density lipoprotein (LDL) cholesterol (9.1%) and improved their diet (p < 0.05). [6]

**Diet:**
A meta-analysis of 32 RCTs involving obese patients showed that moderate and well-balanced calorie restriction is more effective than any other diet, resulting in an average weight loss of about 5 kg after one year. [7]
- A caloric deficit of about 500 kcals per day is the optimal goal for most. [8]

**Strategies to reduce energy intake:**
- Reduce Portion Sizes: Several well-controlled, laboratory-based studies have shown that larger food portions leads to increases in energy intake. Large portion sizes have been shown to override hunger and satiety signals. [9]
- A Lower Energy Density Diet: Studies show that we eat a fairly consistent volume of food day-to-day, rather than a consistent number of calories; the number of calories in a particular volume or weight of food is its energy density; a higher energy density means more calories consumed. [10]
- Several studies have demonstrated that eating low-energy-dense foods (e.g., fruits, vegetables, and soups) maintains satiety while reducing energy intake. [9]
A meta-analysis of 46 trials of dietary counseling for long-term weight loss in overweight adults revealed a maximum net treatment effect of -1.9 BMI units (approximately -6%) at 12 months. [11]

Providing calorie recommendations, frequency of support meetings, and inclusion of exercise were independent predictors of weight change.

Compared with usual care, dietary counseling interventions produce modest weight losses that diminish over time.

Mediterranean Diet:
A 3-year prospective study showed that the adoption of a Mediterranean diet pattern reduced the likelihood of overweight people becoming obese. [12]
- Adherence to this pattern is inversely associated with BMI and obesity, and the risk for becoming obese. [13,14]

Whole Grains:
A significant inverse relation between whole grain intake and BMI has been consistently observed in NHANES outcomes. [15]
- There is strong evidence that replacing refined grains with whole grains helps reduce weight gain and can lead to significant weight loss. [16]
- Weight gain has been inversely associated with the intake of high-fiber, whole-grain foods and positively related to the intake of refined-grain foods. [17]
- The Nurses' Health Study showed that women in the highest quintile of dietary fiber intake had a 49% lower risk of major weight gain than women in the lowest quintile.

Fruit and Vegetables:
- The Nurses' Health Study also showed that those with highest fruit and vegetable intake had a 24% lower risk of becoming obese than those with lowest intake, after controlling for other dietary factors. [18]

Legumes:
NHANES 1999-2002 data showed that greater consumption of legumes (beans) led to higher intakes of dietary fiber, potassium, magnesium, iron, and copper, and a lower body weight and a smaller waist circumference relative to those who did not consume legumes. [19]
- It also led to a 22% reduced risk of being obese, along with a lower systolic blood pressure.

Low Glycemic Load:
A Cochrane review of 6 RCTs that compared a low glycemic index or load diet (LGI) with higher glycemic index or load diets or other diets (Cdiet) in overweight or obese people showed that those on LGI diets lost more weight and had more improvement in lipid profiles than those on other diets. [20]
- Body mass, total fat mass, BMI, total cholesterol and LDL-cholesterol all decreased significantly more in the LGI group.
- Lowering the glycemic load of the diet appears to be more effective in promoting weight loss and improving lipid profiles in obese than nonobese.

Fat intake:
Diet high in fat have been proposed as a cause of obesity, primarily because fat is more energy-dense than other macronutrients. In the Prostate Cancer Prevention Trial, BMI increased by 0.53 for every 500 kcal of fat consumed daily. [21]
- Many studies suggest that the capacity of the body to oxidize dietary fat is a major risk factor for a positive energy balance. Most fat consumed is stored before oxidized. [22]

Exercise/Physical Activity:
Exercise is important when trying to lose weight, but is even more important when it comes to maintaining weight loss.
- Most relevant RCTs show only modest weight loss with exercise alone, and slight increases in weight loss when exercise is added to dietary restriction. [23]
A meta-analysis of 43 studies (3476 participants) found that, compared with no treatment, exercise resulted in small weight losses across studies, but was associated with improved CVD risk factors, even when no weight was lost. [24]

Increasing exercise intensity increased the magnitude of weight loss (WMD -1.5 kg).

Exercise as a sole weight loss intervention resulted in significant reductions in diastolic blood pressure (WMD -2 mmHg), triglycerides (WMD -0.2 mmol/L) and fasting glucose (WMD -0.2 mmol/L). Higher intensity exercise resulted in greater reduction in fasting serum glucose than lower intensity exercise (WMD -0.3 mmol/L).

The energy deficit produced by exercise is far smaller than that produced by dietary restriction. But, studies consistently show the essential role of physical activity in maintaining weight-loss; prospective trials show a clear dose-response relationship between physical activity and weight maintenance. [23]

- Weight regain following weight loss is clearly associated with not getting the recommended physical activity, and having a more sedentary lifestyle, especially more screen time (i.e., TV and computer). [23]

Exercise prevents the loss of muscle tissue with weight loss and increases visceral fat loss. [25]

- The amount of training is more important than training intensity for reducing fat.
- A systematic review of 9 RCTs and 7 non-RCTs of the dose-response relationship between aerobic exercise and visceral fat reduction found that at least 10 METs of aerobic exercise, such as brisk walking, light jogging or stationary cycling, is required for visceral fat reduction; there is a dose-response relationship between aerobic exercise and visceral fat reduction in obese subjects without metabolic-related disorders, but not in those with such disorders. [26]

The specific amount of physical activity needed to lose weight differs from person to person, but in general the more activity, the greater the weight loss. [27]

- When 3 doses of exercise were compared the dose response relation of weight loss was apparent:
  - < 150 min/wk at 6 mos – 7 lbs at 18 mos – 3 lbs
  - 150-200 min/wk at 6 mos – 11 lbs at 18 mos – 9 lbs
  - 200+ min/wk at 6 mos – 13 lbs at 18 mos – 14 lbs

28. Jakicic et al., JAMA 1999

The preferred form of activity for most obese patients is walking, if they can do it, with 30-60 minutes on most, if not all, days the recommended goal to work up to. [29]

- 60 minutes per day is recommended for weight loss. But, health benefits occur with only 30 minutes of daily moderate activity. [30]
- Adding some resistance training does not help with fat loss, but does increase muscle mass.
- Cross-sectional studies show that individuals who walk more are thinner than those who walk less. Pedometer-based walking programs result in a modest amount of weight loss. Longer programs lead to more weight loss than shorter programs. [31]

**Diet Plus Exercise:**

Many studies have shown that the best approach involves changes in both eating and activity behaviors to shift the balance in favor of expenditure.

- A Cochrane review concluded that diet combined with exercise produced a 20% greater initial weight loss than diet alone, and a greater likelihood that the weight loss would be sustained. [32]
- Numerous studies have shown that regular exercise in conjunction with diet results in an average weight loss of 5% to 10%. [33]
- Exercise with no change in diet results in a consistent small weight loss across studies, but must be combined with diet to yield satisfactory results. [34,35]

Another systematic review of 80 RCTs with ≥1-year follow-up showed that weight-loss interventions utilizing a reduced-energy diet with exercise are associated with moderate weight loss of 5 to 8.5 kg (5% to 9%) at 6 months. [36]

- In studies extending to 4 years, a mean 3 to 6 kg (3% to 6%) of weight loss was maintained.
Advice-only and exercise-alone groups experienced minimal weight loss at any time point.

A meta-analysis of 35 RCTs showed that a combination of dieting and increased exercise is more effective than either measure alone. Increasing physical activity was also shown to help maintain weight loss. [7]

Behavior Therapy

Behavior therapy is essential for treating obesity because eating and activity habits are behaviors that need to be changed. [10]

The most effective behavioral interventions combine nutrition education with diet and exercise counseling involving behavioral strategies to help patients build the skills needed to change eating and activity patterns.
- USPSTF recommends high-intensity counseling and behavioral interventions with at least 2 individual or group sessions per month for at least the first 3 months. [37]
- The 5-A framework (Assess, Advise, Agree, Assist, and Arrange) may be useful in helping clinicians guide interventions for weight loss. [37]

A meta-analysis of 19 RCTs showed that the addition of active support, such as behavioral therapy, increases the effectiveness of weight loss in obese patients. [7]
- Having spouses involved increases the likelihood of success; half of participants lost about 7 kg after one year.
- Interventions that do not involve assistance from healthcare professionals have been shown to be no more effective than dieting alone.

A Cochrane review of 32 longitudinal analyses and 17 RCTs showed that intensive counseling strategies incorporating behavioral, dietary, and exercise components promote a weight loss of 3 to 4 kg over 1 to 3.3 years. [38]

A meta-analysis of 19 RCTs showed that the addition of active support makes dietary weight loss measures more effective in obese. [7]
- Behavioral therapy has been shown to be more effective when spouses are involved; half of trial participants lost about 7 kg after one year.
- Assistance from a healthcare professional was also shown to increase the likelihood of success.

The National Weight Control Registry has shown that the following are keys to long-term weight loss success in obese patients: [39,40]
1) A serious, long-term commitment to changes in eating habits and exercise,
2) A low fat diet (around 24% of calories, compared to the generally recommended 30%),
3) Eat breakfast regularly, and eat 5 smaller meals a day, on average
4) Be dedicated to exercise, such as walking 60-90 minutes per day,
5) Do not rely on weight loss drugs,
6) View past failures as learning experiences,
7) Focus on doable, process oriented goals,
8) Monitor body weight regularly (at least weekly) to catch weight gain quickly,
9) Monitor food intake if begin to gain.

A Primary Care Lifestyle Intervention:

- The Counterweight Program is an obesity management program based on the model of Evidence-Based Quality Assessment. It consists of four phases: (1) practice audit and needs assessment, (2) practice support and training, (3) practice nurse-led patient intervention, and (4) evaluation. [41]
- Patient intervention consisted of screening and treatment pathways incorporating evidence-based approaches, including patient-centered goal setting, prescribed eating plans, a group program, physical activity and behavioral approaches, anti-obesity medication and weight maintenance strategies.
- Eighty practices were recruited of which 18 practices were randomized to act as controls and receive deferred intervention 2 years after the initial audit.
Lifestyle Medicine Review

- At 12 month follow-up, 34% overall achieved a clinical meaningful weight loss of 5% or more. Full compliance to the program increased the success rate to 43%.
- The Counterweight Program is an evidence-based weight management model which is feasible to implement in primary care.

B. HYPERTENSION

The relationship of BP to CVD risk is continuous, consistent, and independent of other risk factors. Each increase of 20/10 mmHg doubles risk of CVD across the entire BP range starting from 115/75 mmHg. [42]

- Prehypertension signals the need for increased education to reduce BP to prevent hypertension.

The Blood Pressure Lowering Treatment Trialists Collaboration meta-analysis of 29 RCTs showed that lowering BP reduces risk of cardiovascular events and death by around 20%. [43]

- Larger reductions in BP produce larger reductions in risk

Lifestyle Approach:
The JNC-7 recommends as the first line treatment for hypertension the following: weight loss in overweight, the DASH diet with limited salt intake, regular physical activity, quitting smoking and moderate, if any, alcohol consumption. [44]

The 2008 Canadian Hypertension Education Program Evidence-Based Recommendations Task Force assessed RCTs and systematic reviews of the impact of lifestyle interventions on blood pressure (BP) lowering and concluded that lifestyle modifications to prevent and/or treat hypertension include the following: [45]

- Restrict dietary sodium intake to 65 mmol/day to 100 mmol/day;
- 30 to 60 min of aerobic exercise 4-7 days per week;
- Maintain a healthy body weight (BMI of 18.5 - 24.9 kg/m2) and waist circumference (< 102 cm for men and < 88 cm for women);
- Limit alcohol consumption to ≤14 units per week in men or ≤ 9 units per week in women;
- Follow a diet reduced in saturated fat and cholesterol, that emphasizes fruits, vegetables and low-fat dairy products, dietary and soluble fiber, whole grains and protein from plant sources;

Lifestyle interventions:
A substantial body of evidence supports the effectiveness of lifestyle modifications for lowering BP [46].

- Increasing physical activity, reducing sodium intake, losing weight if overweight, moderating alcohol intake, and following the Dietary Approaches to Stop Hypertension (DASH) diet, can lower BP at least as well as pharmacologic monotherapy.

A meta-analysis 105 RCTs (6805 participants) of lifestyle interventions for hypertension found robust statistically significant effects for: diet (-5.0 mmHg), aerobic exercise (-4.6 mmHg), alcohol restriction (-3.8 mmHg), sodium restriction (- 3.6 mmHg), and fish oil supplements (-2.3 mmHg). [47]

- The reductions were similar for systolic and diastolic pressure.
- Relaxation significantly reduced blood pressure only when compared with non-intervention controls.
- No robust evidence for potassium, magnesium or calcium supplements.

A multifactorial lifestyle modification in treated hypertensive patients over 4 months resulted in a mean 24-h ABP reduction of -4.1/-2.1 mmHg. At 4 months, drug withdrawal improved in men (control 44%; program 66%) but was no different in women (65 and 64%). [48]

Lifestyle Modification – The PREMIER Trial
The NHLBI PREMIER trial investigated the effects of multiple lifestyle changes in adults with stage 1 hypertension. [49,50]
Three groups were compared: 1) Established recommendations group (EST) - weight loss if overweight, increased physical activity, limited alcohol intake, and reduced sodium, 2) Same lifestyle recommendations plus the DASH diet (EST + DASH), and 3) Advice only control (CON).

PREMIER demonstrated that people with above-optimal BP and stage 1 hypertension can gain better control of BP with simple lifestyle changes.

At 6 months, SBP was reduced by 3.7 mm Hg and 4.3 mm Hg more in the two intervention groups than the advice only group.

At 6 months, the prevalence of optimal BP (< 120/80) was 19% with advice only, 30% and 35% with the two interventions.

At 18-month follow-up, relative to the advice only group, the OR for hypertension was 0.83 for the EST group and 0.77 for the EST + DASH group. [51]

- The EST + DASH intervention lowered BP in both younger and older groups, but significantly more so in older individuals. Changes were consistently greater the higher the baseline pressure. [52]
- Both EST and EST+DASH reduced systolic blood pressure, but in patients with the metabolic syndrome only those on the DASH diet were able to lower their BP. [53]

Lifestyle – The Diet, Exercise, and Weight Loss Intervention Trial (DEW-IT)

- A comprehensive lifestyle intervention substantially lowered blood pressure in hypertensive overweight adults already on antihypertensive medication. At the end of the intervention, mean weight loss in the lifestyle group, net of control, was 4.9 kg. Net reductions in 24-hour ambulatory systolic and diastolic blood pressures were 9.5 mm Hg and 5.3 mm Hg, respectively. Corresponding changes in daytime systolic and diastolic blood pressures were 12.1 mm Hg and 6.6 mm Hg. [54]
- The lifestyle group also experienced mean net reductions in total cholesterol (-25 mg/dL), LDL cholesterol (-18 mg/dL), high-density lipoprotein cholesterol (-5 mg/dL).

Weight Loss:

Weight loss in overweight hypertensives is a reliable way to lower BP, and reduce antihypertensive medication dosage requirements. [55].

- Most studies show about a 1 mm/Hg drop in both systolic and diastolic pressure with each 2-3 pounds of weight loss. More weight loss, greater drop in BP. [56]
- A meta-analysis of 25 RCTs showed that a weight loss of 11 pounds (5 kg) reduced systolic blood pressure by 4.4 mmHg and diastolic pressure by 3.6 mmHg or about 1 mmHg per kg of weight loss. [57]

Diet:

The DASH eating plan has been shown to be an effective first-line therapy for stage 1 hypertension. It contains < 2 mg of sodium per day, and an overall pattern that is lower in total and saturated fat and higher in fiber. [58] It includes:

- lots of fruits and vegetables (4-5 servings each),
- 2-3 servings of low fat dairy,
- 7-8 servings of mostly whole grains,
- 1 serving of nuts, seeds, and legumes, and
- limiting meats, poultry and fish to 2 or fewer servings per day.

Diet - The Dietary Approaches to Stop Hypertension Trial

The Dietary Approaches to Stop Hypertension multicenter trial showed that a diet that emphasized fruits, vegetables, and low-fat dairy products with body weight, sodium intake, and physical activity held constant could reduce blood pressure by a net of 11.4 and 5.5 mm Hg systolic and diastolic, respectively in patients with hypertension. [59]

- In another 8-week RCT, blood pressure fell from 146/85 to 134/82 mm Hg in the DASH group; 18 of 23 participants (78%) reduced their systolic blood pressure to <140 mm Hg, compared with 24% with the control (typical) diet and 50% with a diet high in fruits/vegetables groups. [60]
- A key to the DASH diet is that it is made up of regular foods that are available at most grocery stores. Additionally, the DASH diet is consistent with many of the recommendations made by
organizations in the United States: the Dietary Guidelines for Americans, the National Cholesterol Education Program’s Step 2 Diet, and the National Cancer Institute. [61]

Most DASH studies have been tightly controlled, with food provided to participants. The only large-scale study in which patients bought and prepared their own food is the PREMIER study. [62]
- The blood pressure changes observed were smaller, largely explained by participants rarely achieving their food intake goals. It points out the challenge of dietary interventions – they work but can people do them on their own.
- However, a surprising finding in this study was that the “Advice Only” group showed almost as big a blood pressure drop as the group that received intensive counseling on the diet.
- Blacks are especially sensitive to the BP-lowering effects of reduced salt intake, increased potassium intake, and the DASH diet.

Diet - Sodium Intake
- An extensive analysis of the effects on blood pressure (BP) of changes in sodium intake found that a sodium reduction from 100 to 50 mmol/2,100 kcal generally had twice the effect on BP as reduction from 150 to 100 mmol/2,100 kcal. [63]
- Age had a strong and graded influence on the effect of sodium within the typical and DASH diets, respectively:
  - -4.8 and -1.0 mm Hg systolic for 23 to 41 years,
  - -5.9 and -1.8 mm Hg for 42 to 47 years,
  - -7.5 and -4.3 mm Hg for 48 to 54 years, and
  - -8.1 and -6.0 mm Hg for 55 to 76 years.
- The benefits of reduced sodium intake and the DASH diet strengthen as subjects enter middle age, when the rate of cardiovascular disease increases sharply.

An analysis of the effects of sodium restriction and DASH diet showed that both improve BP control. Among subjects with stage 1 hypertension at baseline: [64]
- At a higher sodium intake, the DASH diet increased BP control two-fold over controls (63% vs. 32%).
- Reducing sodium intake alone increased BP control 2.3-fold (74% vs. 32%).
- Combining lower sodium with DASH resulted in the maximum BP control rate (84%).
- BP became normal or optimal in 71% of persons consuming the control diet with lower sodium and 77% of persons consuming the DASH/lower sodium diet.

Another study analyzed the separate effects of the diet and the effects of reducing sodium intake.
- DASH was compared with a control (typical) diet at 3 levels of sodium intake (high, which was U.S. average, intermediate and low). [58]
- The DASH diet significantly lowered systolic pressure at every sodium level and diastolic pressure at the high and intermediate sodium levels.
- Reducing sodium from the high to low level also reduced systolic pressure with either diet.
- The greatest effect occurred when the DASH diet was combined with the lowest sodium intake (-12 mm Hg in SBP in those with hypertension).

Increased potassium intake has also emerged as a strategy to lower BP. [65]
- Other dietary factors, such as a greater intake of protein or monounsaturated fatty acids, may also reduce BP but evidence is inconsistent.

Exercise/Physical activity:
Moderate intensity endurance type physical activity for 30-45 minutes per day on most days of the week can lower BP in people with hypertension by an average of about 5-10 mm/Hg over several months. [66]
- A meta-analyses of RCTs involving either dynamic aerobic endurance training or resistance training showed that in 30 hypertensive study groups, aerobic training resulted in a net reduction of BP of 7/5 mmHg. [67]
- Endurance training also reduced vascular resistance by 7%, plasma noradrenaline by 29% and plasma renin activity by 20%. Bodyweight decreased by 1.2 kg, waist circumference by 2.8 cm, body fat by 1.4% and insulin resistance by 0.31 units.
Lifestyle Medicine Review

- Meta-analysis of 9 resistance training studies (mostly dynamic resistance training) showed a net reduction in BP of 3/4.

**Exercise – Tai Chi and Qigong**
- A systematic review of the effect of tai chi exercise on blood pressure (BP) yielded 26 studies, of which 22 reported reductions in BP with tai chi (3-32 mm Hg systolic and 2-18 mm Hg diastolic BP reductions). [68]
- A systematic review of the evidence of qigong for hypertension found 12 RCTs, of which 7 tested qigong combined with drug therapy compared with drug therapy alone. The quality of studies was low, but some encouraging evidence of qigong for lowering SBP. [69]
- A meta-analysis of two trials with adequate data suggested beneficial effects of qigong [WMD, SBP -12.1 mmHg; DBP -8.5 mmHg]; 5 other RCTs reported positive results in some outcomes.

**Moderation of alcohol consumption:**
Reducing alcohol intake can significantly lower BP in those with hypertension who drink excessively. [70]
- A meta-analysis of 15 RCTs showed that systolic and diastolic blood pressures can be reduced by an average of 3.3 mm Hg and 2.0 mm Hg, respectively, by reducing excessive alcohol intake to a moderate level. [71]
- A dose-response relationship was observed between alcohol reduction and blood pressure reduction in this analysis; greater reductions were seen in those with higher baseline blood pressure.

**Smoking Cessation:**
Smoking has been consistently shown to increase BP; quitting can help lower it. [72,73]

**Stress Reduction:**
Can play an important role if excessive stress and poor response to it are a problem. [74]

A Cochrane review evaluated the effects of relaxation therapies on blood pressure in people with hypertension. [75]
- Relaxation resulted in small, but statistically significant reductions in SBP (-5.5 mmHg) and DBP (-3.5 mmHg) compared to control groups, but most studies were of relatively poor quality.

**C. DYSLIPIDEMIA**

**Lifestyle Interventions:**
Lipid profiles improve when:
* saturated fat and cholesterol intake are reduced,
* weight loss occurs in overweight,
* dietary fiber is increased, and
* physical activity is increased. [76,77]

The ATP III has an extensive section on non-pharmacologic therapy for abnormal blood lipids. [78]
- ATP III cites the high-saturated fat atherogenic diet, obesity, and sedentary lifestyle as the underlying issues to address in a lifestyle approach
- Recommends a program of therapeutic lifestyle change (TLC) including:
  o keeping trans fatty acid intake as low as possible,
  o increasing viscous fiber and plant stanol/sterol esters to reduce LDL-C
  o de-emphasizing total fat and focusing on the kinds of fat
  o increasing physical activity,
  o weight loss in overweight,
  o increasing fish and omega-3 fatty acids,
  o referral to RD or other qualified nutritionist for medical nutrition therapy.

In the Women's Health Study, lower levels of physical activity and higher levels of BMI were independently associated with adverse levels of nearly all lipid and inflammatory biomarkers. A high
BMI was more strongly related to adverse cardiovascular biomarker levels than physical inactivity. However, within BMI categories, physical activity was generally associated with more favorable cardiovascular biomarker levels than inactivity. [79]

**Lifestyle Interventions:**
A Cochrane review of 31 RCTs of treatments targeting HDL cholesterol showed that currently available therapeutic and lifestyle strategies, when optimized, can increase HDL-C levels by 20% to 30%. [80]

**Diet:**
Saturated and trans fatty acid intakes are directly related to LDL cholesterol levels. [81,82]
- Replacing saturated fat intake with good fats such as omega-3 fatty acids and monounsaturated fatty acids can lower LDL while raising HDL levels. [82]

The DASH diet, developed for blood pressure control, also improves lipid levels. [83]
- An 8 week RCT of patients with elevated cholesterol levels, reduced total cholesterol relative to controls by 13.7 mg/dL, LDL by 10.7 mg/dL, and HDL by 3.7 mg/dL (all P < 0.0001), with no change in triglycerides. Weight was maintained.
- Changes were greater in men than women, no differences by race.

A RCT of the ATP-III recommended diet (low saturated fat with plant sterols and viscous fibers) against a statin drug and control group in hyperlipidemic adults showed that LDL was reduced by 29% in the diet group vs. 31% with drug therapy and 8% in control. [84]

Plant stanols/sterol intakes of ≥2 g per day can lower LDL cholesterol levels by up to 15% in addition to diet and lifestyle modification. [85]
- Soluble or viscous fibers (notably β-glucan and pectin) modestly reduce LDL cholesterol levels beyond those achieved by a diet low in saturated and trans fatty acids and cholesterol alone. [86]

Whole-grain intake has been shown to be inversely associated with total and LDL cholesterol in the Framingham Offspring Study. [87]

For High Triglycerides:
A meta-analysis showed that low-carbohydrate diets resulted in greater improvements in triglyceride and HDL cholesterol concentrations than low-fat diets; however, LDL cholesterol was significantly higher on the low-carbohydrate diets [88].
- Reducing simple and refined sugars and alcohol can also reduce triglycerides.

**Weight loss:**
A meta-analysis of 65 RCTs showed that weight loss resulted in an average reduction in LDL cholesterol level of 15 mg/dL and triglyceride level of 26 mg/dL. [89]
- A meta-analysis of 47 RCTs showed that weight loss resulted in an average increase in HDL cholesterol of 1 mg/dL.
- For every 7 pounds of weight loss in overweight, an increase in HDL of 1 mg/dL has been shown. [90,91]

**Exercise -- All**
Dose-response relationships between exercise volume and blood lipid changes suggest that exercise can favorably alter blood lipids at training volumes of 15 to 20 miles per week of brisk walking or jogging that expend between 1200 to 2200 kcal/wk. This range of weekly energy expenditure is associated with 2 to 3 mg/dl increases in HDL-C and triglyceride reductions of 8 to 20 mg/dl. [92]
- Evidence from cross-sectional studies indicates that greater changes in HDL-C levels can be expected with additional increases in exercise training volume.
- Exercise training has little effect on total or LDL cholesterol.

**Exercise - Type 2 diabetes**
A meta-analysis of RCTs that examined the effects of 8 weeks or more of aerobic exercise on lipids and lipoproteins in adults with Type 2 diabetes yielded 7 studies. [93]

- A statistically significant reduction of about 5% was found for LDL-C, whereas no statistically significant improvements were found for TC, HDL-C, TC/HDL-C or TG.

**Exercise – Metabolic Syndrome**

Systematic review and meta-analysis evidence indicates that long-term, moderate to moderately vigorous intensity exercise training, even in the absence of weight loss, improves the dyslipidemic profile by raising HDL-cholesterol and lowering triglycerides in overweight and obese adults with characteristics of the metabolic syndrome. [94]

**Exercise – CVD**

A meta-analysis to examine the effects of aerobic exercise on lipids and lipoproteins in adults with cardiovascular disease (CVD) included 10 studies representing 1,260 subjects (580 exercise, 680 control). [95]

- There was a statistically significant increase of 9% in HDL-C (+3.7 mg/dL) and a statistically significant decrease of 11% in TG (-19.3 mg/dL), but no significant decreases in TC or LDL-C (TC, -8.8 mg/dL; LDL-C, -7.7 mg/dL).

**Exercise – Women**

A meta-analysis of the effects of aerobic exercise on lipids and lipoproteins in women showed significant improvements in all lipids and lipoproteins (TC, -4.3 mg/dl; HDL-C, +1.8 mg/d; LDL-C, -4.4 mg/dL, TG, -4.2 mg/dl). [96]

- Reductions of approximately 2%, 3%, and 5%, respectively, were observed for TC, LDL-C, and TG, whereas an increase of 3% was observed for HDL-C. Aerobic exercise is efficacious for increasing HDL-C and decreasing TC, LDL-C, and TG in women.

**Smoking Cessation:**

- Quitting smoking has been shown to raise HDL by as much as 7-20 mg/dL. [97,98]

**D. METABOLIC SYNDROME / IMPAIRED GLUCOSE TOLERANCE**

The most indisputable fact about the Metabolic Syndrome is the importance of lifestyle changes in managing it. According to the NCEP ATP III – the presence of the syndrome is an indication for intensive lifestyle modification. [99]

- Weight loss, increased physical activity, and an anti-atherogenic diet can improve all of the metabolic abnormalities without pharmaceutical intervention. [100]

**Lifestyle Intervention**

The initial therapeutic approach for the MetS is to reverse the root causes - atherogenic diet, sedentary lifestyle, and overweight or obesity. [101]

- A review of RCTs with at least 6 months follow-up yielded 3 studies based on lifestyle interventions, 5 studies based on drug therapy, and 3 studies based on laparoscopic weight-reduction surgery.
- The striking resolution of the metabolic syndrome with weight-reduction surgery (93%) compared with lifestyle (25%) and drugs (19%) strongly suggests that obesity is the driving force.

There is abundant evidence that a lifestyle approach can reduce the likelihood of developing type 2 diabetes, along with a modest reduction in cardiovascular disease risk factors. [102]

- This has led the ADA to support lifestyle modification as the best method of treating prediabetes. [103]

A meta-analysis of lifestyle interventions reduced diabetes by approximately one-half vs. pharmacologic interventions by approximately one-third. [104]

- The two largest studies, Finnish Diabetes Prevention Study (DPS) [105] and the U.S. Diabetes Prevention Program (DPP) [106], both reduced development of diabetes by 58%.
- DPP evaluated a lifestyle approach to prevent Type 2 diabetes in obese -- was stopped early because results were indisputable: [106]
A Finnish Diabetes Prevention Study (DPS) evaluated diet and exercise intervention in people with impaired glucose tolerance (IGT). After 6 years, fewer than 20% of the diet/exercise group developed type 2 diabetes compared to greater than 40% of the control group. [105]

A Cochrane review of the effects of exercise or exercise plus diet for preventing type 2 diabetes mellitus in patients with IGT or metabolic syndrome (MetS) included 8 trials of exercise plus diet, and 2 studies of diet only. [107] Exercise plus diet interventions reduced the risk of diabetes compared with standard recommendations by 37% over a follow-up of one to six years. Exercise and diet interventions had a modest effect on blood lipids, but improved systolic and diastolic blood pressure levels (-4 mmHg and -2 mmHg, respectively). No significant effects on diabetes incidence were observed with exercise or diet only.

Another analysis found that moderate-intensity lifestyle interventions can delay type 2 diabetes by an average of 11 years and reduce the number of new cases by 20%. This is much greater than what can be achieved with pharmacotherapy (delayed onset by 3 years, reduced cases by 8%). [108]

There is growing evidence of the impact on the clinical status of patients with the syndrome. A significant reduction in prevalence of metabolic syndrome (OR 0.6) and abdominal obesity (0.5) were observed in the Finnish Diabetes Prevention Study. [109] A focused lifestyle intervention carried out by trained professionals was compared to standard unstructured information given by family physicians. The result: after one year, the lifestyle intervention significantly reduced the MetS (OR = 0.3), as well as central obesity (OR = 0.3), hypertriglyceridemia (OR = 0.5), and diabetes (OR = 0.2). [110] The combination of diet and exercise interventions was significantly more effective than either diet or exercise alone in the treatment of the metabolic syndrome after a one year study. Two out of three cases were reversed with the combination vs. only about 1 in 3 in each of the other groups. [111]

The power of a lifestyle intervention was seen in a small study from the Pritikin Longevity Center. [112] Obese men were placed on a highly controlled low-fat (12-15%), high-unrefined carbohydrate, high-fiber, (> 40 gm) diet with daily aerobic exercise (45-60 min) for 3 weeks. After 3 wk, there were significant reductions in BMI, all serum lipids and lipid ratios, fasting glucose, insulin, insulin resistance, oxidative stress, inflammation, chemotaxis, and cell adhesion.

There was a 50% reduction in the metabolic syndrome post-intervention.

Analysis of published data along with Kaiser Permanente administrative data has shown that, compared with no prevention program, the Diabetes Prevention Program (DPP) lifestyle approach can reduce a high-risk person’s 30-year likelihood of developing diabetes from about 72% to 61%, the chance of a serious complication from about 38% to 30%, and the chance of dying of a complication of diabetes from about 14% to 11%. [113] Metformin would deliver about a third of the long-term benefits achievable by lifestyle.

**Exercise, Physical Activity and Fitness**

Low cardiorespiratory fitness is a strong and independent predictor of incident metabolic syndrome in women and men. Age-adjusted incidence rates were significantly lower (linear trend, \( P<0.001 \)) across incremental thirds of fitness in men and women -- 1.0, 0.74, and 0.47 in men; and 1.0, 0.80, and 0.37 in women. [114]

Exercise has many positive effects in people with metabolic syndrome -- improved insulin action, glucose metabolism, aerobic metabolism, mitochondrial density, and respiratory chain proteins. [115] RCT evidence shows that exercise training in people with metabolic syndrome (MS) or impaired glucose tolerance (IGT): [116,117] Increases insulin sensitivity,
Decreases blood pressure, if elevated,
- Reduces triglycerides, increases HDL,
- Reduces inflammation,
- Improves endothelial function [117]

Almost all physical activity has a positive effect on insulin action, but moderate intensity, daily activity seems best. A significant part of the positive effect comes from the last bout of activity. [118] This is because the effect on insulin sensitivity lasts 24 to 48 hours.
- 30 minutes brisk walking 3-7 times per week over 6 months reversed insulin resistance in sedentary insulin resistant individuals with no change in diet or weight. [119]
- Small increases in activity and fitness improved clustered metabolic risk in the ProActive cohort of at-risk individuals. [120]
- Both an increase in overall physical activity and an increase in cardiorespiratory fitness have been shown to improve the entire cluster of metabolic abnormalities. [116]
- Adding some resistance exercise to aerobic exercise can provide additional benefits. [121]
  - A modest amount of moderate-intensity exercise, with no change in diet, significantly improved the MetS; increasing the volume of exercise, i.e., more than 30 minutes per day, had greater benefits than increasing the intensity of exercise. [122]

Just becoming less sedentary has a positive effect on the syndrome.
- The Australian Diabetes, Obesity and Lifestyle study showed that avoiding prolonged periods of sedentary time, especially sitting, has a favorable effect on waist circumference, BMI, triglycerides, and 2-h plasma glucose. [123]
- The Nurses’ Health Study showed the importance of both reducing sedentary activity and increasing physical activity. Sedentary behaviors, especially TV watching, were associated with significantly elevated risk of obesity and type 2 diabetes, whereas even light to moderate activity was associated with substantially lower risk. [124]

Diet Changes
The epidemic of the Metabolic Syndrome has been seen by some as the unwanted result of the dietary low fat crusade that has dominated the past 50 years. [125]
- Fat intake has dropped but obesity and the metabolic syndrome have risen.
- The problem is that low fat diets tend to be high in carbohydrates, and there is evidence that such diets may increase triglycerides and reduce HDL in susceptible people. [126]
- The 2006 AHA scientific statement on diet and lifestyle recommendations recommends a moderate fat intake for the metabolic syndrome. [127]

There is no single diet currently recommended for people with the Metabolic Syndrome, BUT there is evidence to support a Mediterranean style diet as the best approach. [101]
- A systematic review of 35 studies of the effects of the Mediterranean diet showed favorable effects on lipoprotein levels, endothelial vasodilatation, insulin resistance, metabolic syndrome, antioxidant capacity, myocardial and cardiovascular mortality, and cancer incidence in obese patients and in those with previous myocardial infarction. [128]
- Analyses from the Nurses’ Health Study suggest that over 80% of coronary heart disease, 70% of stroke, and 90% of type 2 diabetes can be avoided by healthy food choices that are consistent with the traditional Mediterranean diet, along with regular physical activity and not smoking. [129]
- A Mediterranean style diet reduced the prevalence of the syndrome by nearly 50% over a low fat diet. [130]
- The Dietary Approach to Stop Hypertension (DASH) diet, which is similar to a Mediterranean diet, reduced the prevalence of the metabolic syndrome by 35% compared with a control diet. [131]
- A dietary pattern that included frequent intake of vegetables, fruits, fish, pasta and rice and low intake of fried foods, sausages, fried fish, and potatoes was associated with a better metabolic profile. [132]

There is growing evidence that the type of fat in the diet plays an important role in the development of insulin resistance. [133]
Higher levels of saturated fats impair the action of insulin, while polyunsaturated fatty acids, especially omega-3 and -6, improve insulin sensitivity, hence the beneficial effects of adding a fish oil supplement.

Omega-3 fatty acids in fish oils help reduce triglycerides and increase HDL, and have the added benefit of antioxidant properties.

Substituting whole grains for refined grains in the same hypocaloric diet in people with metabolic syndrome resulted in a significantly greater decrease in percentage body fat in the abdominal region, and a significantly greater reduction in inflammation. [134]

- Increased whole grain and cereal fiber intake was also associated with a reduced risk of developing the metabolic syndrome in the Framingham Offspring Study. [135]

In middle-aged adults, soft drink consumption is associated with a higher prevalence and incidence of multiple metabolic risk factors. Consumption of ≥1 soft drink per day was associated with nearly 1.5 times the risk of developing metabolic syndrome. [136]

- Emerging evidence also suggests that increased consumption of fructose may also be a factor in the growing rates of obesity and the metabolic syndrome. [137]

The Atherosclerosis Risk in Communities (ARIC) study found that long term consumption of a Western dietary pattern, especially including meat, fried foods, and diet soda, increased the risk of developing the Metabolic Syndrome. [138]

- The Whitehall II study confirmed this -- a dietary pattern with high consumption of diet soft drinks, onions, sugar-sweetened beverages, burgers and sausages, crisps and other snacks, and white bread and low consumption of high-fiber breakfast cereals, jam, French dressing/vinaigrette, and whole wheat bread was associated with the development of insulin resistance and type 2 diabetes. [139]

Weight Loss:
Weight loss has a huge impact in improving the risk factors of the metabolic syndrome. Several studies have shown that losing just 7% to 10% of initial body weight is sufficient to improve waist circumference, elevated triglycerides and low HDL-cholesterol, trunk fat, and plasma glucose. [140]

E. TYPE 2 DIABETES
A growing body of evidence shows that lifestyle interventions are a critical adjunct to the management of type 2 diabetes – improves glycemic control, slows progression of the disease, and minimizes the risk of developing complications. [141,142]

- With the high risk for CVD, aggressive management of CVD risk factors is imperative. [143]

Lifestyle Intervention:
The Look AHEAD (Action for Health in Diabetes) trial involved an intensive lifestyle intervention in type 2 diabetics, most also with the MetS. [144]

- Intervention involved group and individual counseling to achieve weight loss through decreased caloric intake and increased physical activity.
- 1-year outcomes included 8.6% weight loss, 21% improvement in fitness, and 0.7% reduction in A1C (from a baseline of 7.3%), as well as improvements in blood pressure, triglycerides and HDL cholesterol.

A short-term (3 wk) lifestyle intervention showed how quickly metabolic changes can occur with lifestyle modifications. [145]

- However, it was in a tightly controlled environment (the Pritikin Longevity Center).
- A high-fiber (> 40 gm), low-fat diet with daily aerobic exercise led to significant improvements in total cholesterol (- 40 mg/dL), LDL (- 27 mg/dL), fasting glucose (- 31 mg/dL), fasting insulin (- 10 mcU/ml), insulin resistance, as well as indicators of oxidative stress, inflammation, and endothelial function in men with type 2 diabetes and the metabolic syndrome.
Low cardiorespiratory fitness has been shown to be a powerful and independent predictor of mortality in people with diabetes. The Aerobics Center Longitudinal Study showed that low fit men with T2DM have twice the mortality risk of moderately fit men. [146]

- The Nurse’s Health Study found an inverse relation between hours per week of moderate to vigorous activity and risk for CVD events in women with T2DM (> 4 hrs/wk, nearly half the risk). [147]
- Walking at least 2 hours a week was shown to reduce the chance of premature death from all causes or cardiovascular disease in diabetics by 34% to 54%. [148]

A systematic review of the effects of exercise on fitness in Type 2 diabetics found a 12% increase in VO₂max in exercise groups vs. a 1% decrease in control groups. [149]

- Higher exercise intensities produced larger improvements in VO(2max) and greater improvement in HbA1c compared to interventions that tested larger exercise volume.

**Effect on Control:**

A 2001 meta-analysis of 12 aerobic exercise studies with no changes in diet in people with Type 2 diabetes found a modest reduction in A1c of 0.7%, independent of any change in body weight. [150]

- Increasing exercise intensity had a greater effect than increasing duration or frequency of exercise.
- This led the ADA to recommend including some vigorous exercise in interventions for glycemic control in those without contraindications. [151]
- Adding some resistance exercise to an aerobic program has been shown to significantly improve glucose control and insulin sensitivity over an aerobic program alone. [152]

A later meta-analysis (2006) of the effects of different modes of exercise training on glucose control and risk factors for complications in Type 2 diabetics found trivial differences among aerobic, resistance, and combined training on HbA(1c); for training lasting ≥12 weeks, the overall effect was a modest reduction of 0.8, similar to dietary, drug, and insulin treatment. [153]

- Combined training was generally superior to either aerobic or resistance training alone.

A 2006 Cochrane review of 14 RCTs of the effects of exercise in type 2 diabetes mellitus found that the exercise interventions significantly improved glycemic control (decrease in hemoglobin A1c levels of 0.6%). [154]

- Exercise significantly increased insulin response, and decreased plasma triglycerides. This was associated with a reduction in visceral and subcutaneous adipose tissue. No adverse effects were reported.

A significant correlation has been observed between insulin sensitivity and the average number of steps taken in a day. The improved effectiveness of insulin is attributable, at least in part, to increases in GLUT4 protein, IRS1 and PI3-kinase protein in skeletal muscle. [155]

**Diet**

NHANES 1999-2002 data showed that diabetic patients treated by diet alone had the best glycemic control (66% in good control vs. 39% overall). [156]

In terms of diet changes: [157]

- No single diet best for all diabetic patients.
- High protein diets (> 20%) are not recommended.
- A moderate carbohydrate intake (45-65% of caloric intake) is recommended, no less than 130 grams daily.

For glucose control, a focus on total carbohydrates, whatever the source, is most effective; however, emphasis should be on carbohydrates from vegetables, legumes, whole grains, and fruits for fiber and nutrient density; foods high in sugar are usually nutritionally weak. [158,159]

The strongest evidence supports an increased intake of whole grains and dietary fiber to improve insulin sensitivity and reduce the risk of complications. [160-165]
While there is insufficient evidence to recommend a low GI or GL diet for primary prevention, there is evidence that it may assist the management of type 2 diabetes; low GI foods with high nutrient densities are encouraged. [166-168] Includes legumes, whole oats, apples, pumpernickel bread, low fat dairy, whole grain pasta, grapefruit and yams. Replacing saturated fats with monounsaturated fats, polyunsaturated fats or carbohydrates has been shown to improve lipid profiles in diabetic patients. [168] Emphasis on MUFA is particularly beneficial in those who respond to higher carbohydrate intakes with increased triglycerides.

F. CARDIOVASCULAR DISEASE
A systematic review found that 4 lifestyle changes can affect mortality risk in CVD patients: [169]

- smoking cessation -- a 36% reduction (RR, 0.64; 95% CI, 0.58 to 0.71),
- increased physical activity -- a 24% reduction in mortality risk (RR, 0.76; 95% CI, 0.59 to 0.98),
- moderate alcohol use -- a 20% reduction in mortality risk (RR, 0.80; 95% CI, 0.78 to 0.83), and
- dietary changes -- a 44% reduction in mortality risk (RR, 0.56; 95% CI, 0.42 to 0.74).

A Cochrane review of 63 RCT of the effectiveness of secondary cardiac prevention programs with and without exercise components showed that a wide variety of secondary prevention programs improve health outcomes in patients with coronary disease. [170]

- The summary risk ratio for all-cause mortality was 0.97 at 12 months, but 0.53 at 24 months.
- For recurrent MI, it was 0.83 at 12 months. Effects were similar for programs that included risk factor education or counseling with or without a structured exercise component, and for programs that were solely exercise-based.

A review of literature examining interventions to assist patients in achieving risk factor reductions through lifestyle change after myocardial infarction or coronary artery revascularization found that evidence supports: frequent follow-up, intensive diet changes, individualized and group exercise, coaching, group meetings, education on lifestyle modification and behavior change, and formal cardiac rehabilitation programs. [171]

Lifestyle Interventions:
The Lifestyle Heart Trial (Ornish) provided conclusive evidence that intensive lifestyle changes can regress coronary atherosclerosis. [172]

- Program included a 10% fat - whole food - vegetarian diet, aerobic exercise, stress management training, smoking cessation, and group psychosocial support.
- At one year, 23 of 28 patients experienced regression. [172]
- At 5 year follow-up of 48 patients with moderate to severe CAD randomized to lifestyle change or usual-care: [173]
  - Average stenosis diameter decreased by 8% in lifestyle group vs. a 28% increase with usual care.
  - 25 new events occurred in lifestyle group vs. 45 in usual care group (with 8 fewer patients).

The Multicenter Lifestyle Demonstration Project showed that significant improvements in diet (low fat, whole foods, plant-based), exercise, stress management, and social support can be achieved and maintained in heart disease patients, especially with spousal participation. [174]

- The program resulted in significant improvements in medical (e.g., plasma lipids, blood pressure, body weight, exercise capacity) and psychosocial (e.g., quality of life) outcomes.

Diet Changes:
A Mediterranean diet pattern has been shown to be an effective adjunct to pharmacotherapy for secondary prevention. The focus on good fats has been suggested to be more effective than simply reducing total fat intake. [175,176]

- The Lyon Diet Heart Study compared a Mediterranean-type diet with a “Western” diet following an initial MI. [177]
At 4 year follow-up, there was a 32% reduction in cardiac death and nonfatal MI in the Mediterranean diet group:
- Cardiac death/nonfatal MI - 14 events vs. 44 in the Western diet group,
- Unstable angina, stroke, heart failure, pulmonary or peripheral embolism - 27 events vs. 90, and
- Hospital admissions - 95 events vs. 180

Omega-3 fatty acids found primarily in certain cold water fish and flax are good fats and found to be protect against CHD events, including sudden death, in those with CHD. [178]
- Modest fish consumption of 1-2 servings per week of species rich in omega-3 fatty acids can reduce CHD death by 36% and total mortality by 17%. [179]
- The consumption of 2 servings (about 8 oz) per week of fish high in EPA and DHA is associated with a reduced risk of both sudden death and death from coronary artery disease in adults. [180,181]

Smoking Cessation:
Smoking promotes the progression of CVD and, in CAD patients, is an important predictor of future CV events. [182]

Several studies have shown that quitting improves longevity and reduces recurrent events. [183]
- A systematic review of cohort studies found that smoking cessation was associated with a 36% reduction in mortality risk in CAD patients. [169]
- Estimated to increase life expectancy by 2.8 years for men, 2.3 years for women. [184]
- Risk declines rapidly, approaching that of a nonsmoker in about 3 years. [185]
- According to the USPSTF, a combination of long-term behavioral support and pharmacologic therapy with bupropion, with or without NRT, should be offered to all CVD patients. [186]

A systematic review of the effects of individual counseling on smoking cessation showed that individual counseling for 6 months or longer resulted in a 1.6 times greater likelihood of successful cessation. [187]

Weight Loss:
Although the association between obesity and CVD is well established, there have been no large scale RCTs of the effects of weight loss on cardiovascular outcomes. [188,189]
- Most of the evidence on the CV benefits of weight reduction has been obtained from observational studies where weight loss was a secondary end point.
- Several studies show that weight loss in overweight or obese reduces CVD risk factors.

Caloric reduction of 500 kcal/d or more is recommended for most overweight patients with CVD until they reach their ideal body weight. [190]

Exercise:
Several systematic reviews have shown the importance of exercise for patients with CVD. [191]
- An energy expenditure of about 1600 kcals per week has been found to be effective in halting the progression of CAD, and 2200 kcals per week has been shown to be associated with plaque reduction in patients with atherosclerotic heart disease. [192,193]

A systematic review of 48 RCTs (8940 patients) investigating the effectiveness of exercise-based cardiac rehabilitation showed that, compared with usual care, exercise rehab was associated with reduced all-cause mortality (OR = 0.80) and cardiac mortality (OR = 0.74), greater reductions in total cholesterol level (WMD, -14.3 mg/dL), triglyceride level (WMD, -20.4 mg/dL), and systolic blood pressure (WMD, -3.2 mm Hg); and lower rates of self-reported smoking (OR = 0.64). [194]
- No significant differences in the rates of nonfatal myocardial infarction and revascularization, or changes in high- and LDL cholesterol levels and diastolic pressure, or health-related quality of life were observed.
A prospective study of 773 men with known CAD followed for 5 years showed that those who engaged in light and moderate levels of activity had 58% and 53% lower mortality risks than those who engaged in minimal or no activity. [195]

A RCT involving 62 patients with angiographically proven CAD randomized to regular physical exercise or usual care showed that after 1 year, atherosclerosis progressed in those who exercised the least (mean energy expended, 1000 kcal/wk), while it modestly regressed in those who exercised the most (mean, 2200 kcal/wk). [196]

Exercise Recommendations: [197]
- An Expert Working Group of the National Heart Foundation of Australia reviewed the evidence for exercise with CVD since the US Surgeon General's Report on Physical Activity and Health in 1996. The Expert Working Group recommended that: people with established clinically stable cardiovascular disease should aim to achieve 30 minutes or more of moderate intensity physical activity on most, if not all, days of the week; less intense and even shorter bouts of activity with more rest periods for those with advanced CVD; and regular low-to-moderate level resistance activity, initially under the supervision of an exercise professional, is encouraged.
- Benefits for people with CVD include augmented physiological functioning, lessening of cardiovascular symptoms, enhanced quality of life, improved coronary risk profile, superior muscular fitness and, for survivors of acute MI, lower mortality.
- The greatest potential for benefit is in those people who were least active before beginning regular physical activity, and this benefit may be achieved even at relatively low levels of physical activity.

Excessive Alcohol Consumption:
A number of studies have shown that reducing excessive alcohol consumption to a moderate level reduces the risk of a variety of vascular diseases, including MI, PVD, and sudden cardiac death. [198]

Psychosocial Risk:
A number of psychological factors, including chronic hostility, social isolation, and lack of social support have been linked to poorer outcomes in patients with CHD.
- A meta-analysis of 37 smaller studies showed that stress management and health education in patients with CHD may reduce both recurrent MI and cardiac death by up to a third. [199]
- But, this evidence is far from conclusive. [200]

G. STROKE
Exercise - Strengthening
High-intensity resistance training has traditionally been excluded from stroke rehabilitation programs because of concern that high-exertion activity will increase spasticity.
- A systematic review of 11 studies that met the criteria to determine the effects of resistance training on functional outcomes and spasticity post-stroke found that resistance training can increase strength, gait speed, and functional outcomes and improve quality of life without exacerbating the risk of spasticity. [201]
- Another systematic review of 15 RCTs found that strengthening interventions had a small positive effect on both strength and activity in stroke patients with no increase in spasticity. [202]

Exercise - Aerobic
A Cochrane review of aerobic exercise in stroke patients showed a consistent positive effect on aerobic capacity, regardless of the stage of recovery. [203]
- Peak VO2, peak workload, walking velocity and walking endurance were all significantly improved. Authors concluded that aerobic exercise should be an important component of rehabilitation in people with mild and moderate stroke.

H. HEART FAILURE
Exercise
A systematic review of 69 RCTs of exercise interventions for HF suggested that exercise might slow the progression of HF. [204]

Another systematic review of home-based exercise programs for people with chronic heart failure produced 10 RCTs with 648 participants. [205]
- Programs increased 6-min walking distance by an average of 41 m and peak VO2 by 2.71 ml/kg/min more than usual activity.
- It could be valuable for those without access to hospital-based exercise.

A modified Philadelphia Panel rating method to evaluate the evidence supporting exercise interventions in patients with congestive heart failure (CHF) used a systematic review of RCTs and CCTs. [206]
- Aerobic exercise was shown to improve VO2 max, dyspnea, work capacity, and left ventricular function. Resistance exercise was shown to improve left ventricular function, peak lactate levels, muscle strength, and muscle endurance.

A meta-analysis (14 RCTs) of the effect of exercise training on left ventricular (LV) remodeling in heart failure found that aerobic training reverses LV remodeling in clinically stable individuals. [207]
- Ejection fraction significantly improved (WMD = 2.59%), as did end-diastolic volume (WMD = -11.49 ml) and end-systolic volume (WMD = -12.87 ml).
- Adding strength training did not improve outcomes further.

Another systematic review (35 RCTs) of the effect of exercise training on cardiac outcomes with CHF found significant improvements in systolic blood pressure, heart rate, cardiac output, peak oxygen uptake, anaerobic threshold, and 6-min walking test. [208]
- The Minnesota Living with Heart Failure Questionnaire improved by an average of 9.7 points.
- Exercise training has clinically important effects on exercise capacity and HRQL, and may have small positive effects on cardiac performance during exercise.

A 2004 Cochrane review (29 RCTs) investigated the effectiveness of exercise-based interventions compared with usual medical care on the mortality, morbidity, exercise capacity and health related quality of life, of patients with heart failure found that exercise training significantly increased VO2max by 2.16 ml/kg/min, exercise duration increased by 2.38 minutes, work capacity by 15.1 Watts and distance on the six minute walk by 41 meters. [209]
- HRQoL improved in 7 of 9 trials that measured this outcome.

A larger systematic review of 81 studies (30 RCTs, 9 crossover, 37 longitudinal cohort, and 5 nonrandomized controlled trials) found an average 17% increase in peak oxygen consumption in 40 aerobic training studies, 15% in 13 studies of combined aerobic and strength training, and 16% in the one study of inspiratory training. [210]
- Exercise training was shown to be safe and effective in patients with heart failure; there were no reports of deaths directly related to exercise during more than 60,000 patient-hours of exercise training.

A meta-analysis of the effect of exercise training on survival in HF patients (9 datasets with 801 patients) found that during a mean follow up of nearly 2 years there was an overall reduction in mortality: 88 (22%) deaths in the exercise arm vs. 105 (26%) in the control arm. [211]
- Exercise training significantly reduced mortality (hazard ratio 0.65).
- The secondary end point of death or admission to hospital was also reduced (0.72).

I. PERIPHERAL ARTERIAL DISEASE (PAD)
Exercise
A Cochrane review yielded 22 trials of exercise therapy for leg pain on walking associated with intermittent claudication. [212]
- Compared with usual care or placebo, exercise significantly improved maximal walking time: mean difference (MD) 5.12 minutes; with an overall improvement in walking ability of approximately 50% to 200%.
Walking distances significantly improved: pain-free walking distance by 82 meters and maximum walking distance by 113 meters. Improvements persisted for up to two years.

An earlier Cochrane review (8 trials) of supervised versus non-supervised exercise therapy for people with intermittent claudication found that supervised exercise therapy was more effective, with approximately 150 meters greater increase in walking distance. [213]

**Lifestyle Modification**

A systematic review of the effects of life-style modification on mortality and cardiovascular events in patients with PAD found that despite the lack of RCT data, there is sufficient evidence to recommend some life-style modification as part of the overall approach to risk reduction in these patients. [214]

- There is compelling evidence to support smoking cessation, increased exercise and improved diet.

**J. CHRONIC OBSTRUCTIVE PULMONARY DISEASE (COPD)**

**Inspiratory Muscle Training and Exercise**

- A summary of 16 meta-analyses of the effect of inspiratory muscle training (IMT) in patients with stable COPD showed that targeted inspiratory muscle training significantly improves inspiratory muscle strength, peak inspiratory flow rate, inspiratory muscle endurance, exercise capacity, Borg Score for Respiratory Effort, dyspnea, and quality of life. [215]
- Combining targeted inspiratory muscle training with exercise and/or pulmonary rehabilitation led to greater improvements in inspiratory muscle strength and exercise tolerance than exercise alone. [216]

**Comprehensive Pulmonary Rehabilitation**

A systematic review of the effectiveness of disease-management programs for COPD showed that the disease-management programs significantly improved exercise capacity (32.2 m), decreased risk of hospitalization, and moderately improved health-related quality of life. All-cause mortality did not differ. [217]

A systematic review of 31 RCTs of the impact of pulmonary rehabilitation programs on health-related quality of life (QoL) and exercise capacity in patients with COPD showed significant improvements in dyspnea and fatigue, emotional function and patients' control over their condition; improvements were moderately large and clinically significant. [218]

- The effect on exercise capacity was small and slightly below the threshold of clinical significance for the six-minute walking distance (WMD: 48 m; n = 16 trials).

Another systematic review (6 RCTs) of the effect of pulmonary rehabilitation (with or without education) on anxiety and depression in patients with COPD found that rehab programs with up to three sessions per week of supervised exercise, along with education and psychosocial support, significantly reduced anxiety and depression more than standard care. [219]

- Education alone and exercise training alone were not associated with significant reductions in either anxiety or depression.
- Comprehensive pulmonary rehabilitation was also associated with short-term gains in both disease-specific and generic HRQOL, not sustained at 12 months.

**Self Management**

Self-management of COPD is aimed at teaching skills needed to carry out medical regimens specific to the disease, guide health behavior change, and provide emotional support for patients to control their disease and live functional lives.

- A Cochrane review of self-management programs for COPD combined 14 trials and showed a significant reduction in the probability of at least one hospital admission in patients receiving self-management education compared to usual care (OR 0.64). The one year NNT was 10 for patients with a 51% risk of exacerbation, to 24 for patients with a 13% risk of exacerbation. [220]
- A small but significant reduction was seen for dyspnea, but no significant effects were found for exacerbations, ER visits, lung function, exercise capacity, or days lost from work.
K. OSTEOARTHRITIS
Osteoarthritis is generally undertreated, and functional consequences ignored. [221]
- Undertreatment contributes to poor QOL, can lead to other serious co-morbidities, including depression, sleep disturbances, anxiety, fatigue, impaired ambulation, dementia, aphasia, and decreased socialization. [221]
- Patient misperceptions that prescribed activity will exacerbate symptoms may lead to a cycle of inactivity, depression and anxiety and worsening symptoms. [222]
- Addressing knowledge and skill deficits, perceived lack of self efficacy, and social support may mitigate perceived distress and improve QOL. [222]

Non-Pharmacological Approaches
In developing evidence-based recommendations for the management of hip and knee osteoarthritis (OA) an expert panel concluded that there is no statistically significant difference between non-pharmacological therapies and pharmacological therapies. [223]
- Optimal management requires a combination of both.
- 12 non-pharmacological modalities had sufficient evidence to be recommended: education and self-management, regular telephone contact, referral to a physical therapist, aerobic, muscle strengthening and water-based exercises, weight reduction, walking aids, knee braces, footwear and insoles, thermal modalities, transcutaneous electrical nerve stimulation and acupuncture.

Lifestyle interventions:
Weight loss, appropriate exercise, and avoidance of repetitive joint stress all have a positive role in management; may even decrease rate of progression. [221,224]
- Growing body of evidence supports this approach. [225]
- Pharmacotherapy does not tackle the underlying disease process, and may miss the mark in as many as half of patients, and concerns about safety are common. [226]
- An individualized approach based on each patient’s unique biopsychosocial needs is crucial for successful management [227]

Exercise:
Is a “powerful mainstay in the armamentarium of physicians” [228]
- Optimal prescription not identified, but consensus is that any increase in lifestyle activity is good; a variety of activities ranging from aerobics to resistance to those emphasizing balance and ROM can reduce pain, improve mobility and QOL. [222]
- Low impact exercise is more effective in reducing pain. [229,230]
- Stretching without strengthening, as well as isometric exercise is less effective.

Adults with arthritis experience significant disability and co-morbidities due to reduced physical activity.
- A meta-analysis of physical activity interventions in arthritis patients included 28 studies and showed moderate positive effects on physical activity behavior and small positive effects on pain and physical function outcomes. [231]
- Another systematic review of 6 scientific reviews and 10 RCTs on the effect of exercise on OA management concluded that the weight of the evidence supports the effectiveness of structured exercise programs (either strength training or aerobic exercise) in the management of in middle-aged and elderly subjects with OA. [232]

Another systematic review of RCTs and CCTs on the long-term effectiveness of exercise therapy for osteoarthritis yielded 5 high-quality and 6 low-quality RCTs. [233]
- The positive post-treatment effects of exercise therapy on pain and physical function are not sustained in the long term.
- However, when additional booster sessions are included after the treatment period the beneficial effects on pain and physical function are more likely to be maintained.
- Benefits are transient – need to be performed regularly, 1-3 times/week; some evidence supports a minimum of 3 days per week for about 35 min [234]
- Group programs have been shown to enhance motivation, support, and compliance over home-based programs [235], but a meta-analysis found both to be effective. [236]
Exercise – Aquatic
Group-based water exercise has been shown to result in significant improvement in pain and physical function with knee or hip OA [237]

A Cochrane review of the effectiveness and safety of aquatic-exercise in the treatment of knee and hip osteoarthritis yielded only 6 trials (800 participants). [238]
- For combined knee and hip osteoarthritis, there was a small-to-moderate effect on function and a small-to-moderate effect on quality of life; no evidence of effect on walking ability or stiffness immediately after end of treatment.
- Aquatic exercise appears to have some beneficial short-term effects for patients with hip and/or knee OA while no long-term effects have been documented.
- May be useful as the first part of a longer exercise program for OA patients.

A 1 year RCT found that group-based water exercise can produce significant reduction in pain and improvement in physical function in older adults with lower limb OA, and may be a useful adjunct in the management of hip and/or knee OA. [239]

Exercise – Knee OA
A Cochrane review and meta-analysis of 32 RCTs examining the effectiveness of land-based exercise (as opposed to water exercise) for OA of the knee found a beneficial effect on both pain and physical function. [240]
- Results were better with more direct supervision, but remained significant and clinically relevant at lower levels of supervision; authors concluded that there is platinum level evidence that land-based therapeutic exercise has at least short term benefit in terms of reduced knee pain and improved physical function for people with knee OA. The magnitude of the treatment effect is comparable to estimates for NSAIDs.

A review of 23 systematic reviews published between 2000 and 2007 on physical therapy interventions for patients with knee osteoarthritis concluded that there is high-quality evidence that exercise and weight reduction reduce pain and improve physical function in patients with osteoarthritis of the knee. [241]

A meta-analysis of 16 studies reporting exercise and/or self-management interventions for patients with knee OA found that exercise regimens can improve physical health and lessen the overall impact of OA. [242]
- Self-management programs significantly improved psychological outcomes only; the overall effect of OA was not significantly improved.

Exercise – Hip OA
A systematic review of evidence for the efficacy of exercise for hip OA from 9 RCTs that met the inclusion criteria found a beneficial effect of exercise with an effect size (ES) of -0.38. [243]
- The exercise benefit remained significant when only the better quality studies were included (ES of -0.46).
- Therapeutic exercise, especially with an element of strengthening, is an efficacious treatment for hip OA.

Exercise – Tai Chi
- A systematic review of controlled clinical trials that investigated the effectiveness of tai chi for osteoarthritis found 5 RCTs and 7 non-RCTs. [244]
- Two RCTs suggested improvement of physical function, while two other RCTs failed to do so.
- There is some encouraging evidence that tai chi may assist in pain control with knee OA. However, the evidence is not convincing for pain reduction or improvement of physical function.

Activity Recommendations
- A Cochrane review of 72 reports arrived at the following evidence-based conclusions: [245]
  - OA patients in general can pursue a high level of physical activity, provided the activity is not painful and does not predispose to trauma (grade B).
Radiographic or clinical OA is not a contraindication to promoting activity in patients who have a sedentary lifestyle (grade C).

- Exercises and other structured activities for health improvement have a favorable effect on pain and function in the sedentary knee OA patient, when performed at a frequency of one and three times per week (grade B).

- There is no scientific argument to support halting exercise in case of an OA flare-up (grade C).

- The OA patient can continue to engage in recreational sports as long as the activity does not cause pain (Grade C).

- The OA patient who practices a sport at risk for joint trauma should be encouraged to change sport (Grade C).

- Factors such as high loads on the joint, unnatural body position, heavy lifting, climbing and jumping may contribute to knee and hip OA.

- An occupational history should always be part of managing the OA patient (Grade B).

Diet:

No single diet prescription has been shown to be best for OA; however, higher intakes of fruits and vegetables have been associated with reduced risk, thus should be recommended due to multiple other benefits to health. [246]

Weight Loss:

Weight loss in overweight patients is a key goal; 10 pounds of extra weight increases the force on the knee by 30-60 pounds each step; excess weight has also been associated with higher rates of hand OA (suggesting a systemic factor as well). [221]

- Meta-analysis found that a 5% or greater weight reduction is associated with a significant reduction of pain and disability [247]

- The Arthritis, Diet, and Activity Promotion Trail (ADAPT) showed that modest weight loss (5%) combined with exercise is best approach [248]

- The combination improved functioning, pain, performance, and endurance relative to either weight loss or exercise alone.

- Weight loss must include exercise to build strength, mobility, confidence, joint stability, and muscle endurance

- Weight loss through exercise, with or without a hypocaloric diet, improved symptoms and functioning in programs from 8 weeks to 6 months. [249-251]

Unloading and Alignment Correction

- Reasonable evidence from RCTs suggests that therapies to correct alignment across knee joint can improve pain and function [252]

L. RHEUMATOID ARTHRITIS

Overall

A review of the effectiveness of non-pharmacological treatment modalities for RA found that the evidence of effectiveness varies among the different modalities, with relatively strong support for exercise and self-management interventions, and modest support for joint protection programs, specific orthoses and comprehensive care interventions. [253]

- However, few studies have compared different attributes of non-pharmacological modalities or comprehensive care models for early RA, so the optimal timing, intensity, duration and mode of delivery remain unclear.

A Cochrane review of RCTs evaluating rehabilitation interventions for people with rheumatoid arthritis found that patient education and joint protection training using behavioral approaches; dynamic exercise therapy, hand exercises and hydrotherapy; and cognitive-behavioral therapy (in people with poorer psychological status) are effective in reducing pain and maintaining function over at least a one-year period. [254]

A scientific committee evaluated the evidence from 198 publications, and arrived at four recommendations for nonpharmacological treatment of early RA: [255]
(1) physical exercise and sports can be recommended; muscle strength exercises are advisable;
(2) metatarsal pain and/or foot alignment abnormalities should be looked for regularly, and
appropriate insoles prescribed if needed;
(3) specific dietary measures and nutritional supplements are not indicated for early RA;
(4) elimination diets, particularly with low intakes of dairy products, should be discouraged.

Exercise -- All
A systematic review of the effectiveness of exercise interventions in improving disease-related
characteristics in patients with rheumatoid arthritis (RA) included 40 studies and found strong
evidence that various types of exercise from low to high intensity are effective in improving disease-
related characteristics and functional ability in RA patients. [256]

Exercise – Tai Chi
The major goals of treatment are to relieve pain, reduce inflammation, slow down or stop joint
damage, prevent disability, and preserve or improve the person’s sense of well-being and ability to
function.
- Tai Chi has been recognized in China as an effective arthritis therapy for centuries.
- A Cochrane systematic review of the effectiveness and safety of Tai Chi for people with RA
  found significant benefits on lower extremity range of motion, in particular ankle range of motion.
  The effect on pain was not reported. [257]

M. CANCER – ALL
Multi-component programs:
Can reduce fatigue and associated symptoms.
- A systematic review of 57 RCTs investigating multi-component interventions for cancer-related
  fatigue and associated symptoms (vigor/vitality) found that exercise and psychological
  interventions both reduced fatigue, with no significant differences between them. [258]
- Specifically, multimodal exercise and walking programs, restorative approaches, supportive-
  expressive, and cognitive-behavioral psychosocial interventions were most promising.
Some evidence supports the positive effects of self-management programs and self-efficacy
enhancing programs on health outcomes, exercise adherence and later exercise behavior in cancer
patients. [259]

Exercise:
Has many benefits for cancer patients.
- A 2007 review of the evidence of the effects of exercise on risk factors for adverse outcomes of
cancer and its treatment showed that there is mounting evidence that exercise improves fatigue,
physical functioning, and cardio-respiratory fitness. [260]
- Preliminary evidence suggests that exercise also contributes to improvements in body weight
  and composition, metabolic risk factors, and immune function, and may even influence disease-
  free and overall survival in selected populations.
A meta-analysis of exercise interventions for people treated for cancer showed that exercise
interventions resulted in small positive effects on health and well-being outcomes, including physical
function, for symptoms other than fatigue, and for body composition. [261]
- More modest positive effect sizes were documented for mood, quality of life, and fatigue.

Can help reduce fatigue.
- The strength of the evidence supporting exercise in managing cancer-related fatigue is growing.
  [262]
- All patients with cancer should be encouraged to maintain an optimum level of physical activity
during and following cancer treatment. Patients with breast cancer and other selected patients
should receive recommendations for moderate exercise programs.
A Cochrane review of 28 studies of the effects of physical activity in reducing cancer-related fatigue
found that exercise was statistically more effective than control interventions both during and
following therapy. [263]
Other reviews found more limited support for reducing fatigue, citing lack of research with heightened fatigue as an eligibility criterion. [264,265]

Improves fitness and capacity. Evidence supports the positive effects of exercise on exercise capacity during and after completion of cancer treatment. [265]
- Evidence for the effectiveness of progressive resistance training on muscle strength is also promising.
- A systematic review of physical activity interventions in cancer survivors during and after treatment found 22 high-quality studies that provided evidence of a small to moderate effect of physical activity interventions on cardiorespiratory fitness during and after treatment, physiologic outcomes and symptoms during treatment, and vigor post-treatment. [266]
- Regular physical activity has also been shown to be associated with improved QOL and health status in cancer patients. [267]

N. BREAST CANCER
Exercise
May improve survival.
- In breast cancer patients, physical activity equivalent to walking at least an hour a week has been associated with improved survival compared with no exercise. [268]
- Greatest benefit was seen with 3-5 hours per week.

Can improve function and quality of life.
- In women with breast cancer, a meta-analysis of 10 studies (N = 588) that met inclusion criteria, found that aerobic exercise significantly improved cardiopulmonary function and body composition. [269]

A Cochrane review of 14 studies on the effects of exercise on quality of life in women with breast cancer found that exercise significantly improved quality of life. [270]
- It also led to significant improvements in physical functioning, peak oxygen consumption and fatigue.

Diet and weight control
Can help improve breast cancer prognosis. [271]
- Several nutritional factors, notably vegetable/fruit intake and fat intake may modify the progression of disease and prognosis after the diagnosis of breast cancer.
- The majority of studies of vegetable and fruit intake show a direct relationship with survival.
- On the other hand, nearly half of studies of dietary fat intake found an inverse association with survival.
- Overweight or obesity is associated with poorer prognosis in most studies.
- Treatment-related weight gain may also reduce disease-free survival and quality of life, while increasing the risk for co-morbidities.
- Healthy weight control with an emphasis on exercise and a diet with adequate vegetables, fruit, whole grains, and low-fat dairy and low in saturated fat may lower overall disease risk in breast ca patients.

O. OSTEOPOROSIS
Greatest known modifiable risk factor is excess weight; weight gain associated with development and progression of OA; can create a vicious cycle of pain, inactivity and weight gain. An update of the evidence-based position statement of The North American Menopause Society (NAMS) in 2002 regarding the management of osteoporosis in postmenopausal women found that: [272]
- The primary goal of therapy is to prevent fractures by slowing or stopping bone loss, maintaining bone strength, and minimizing or eliminating factors that contribute to fractures.
- The most common risk factors for osteoporotic fracture are advanced age, low bone mineral density, and previous fracture as an adult.
Management focuses first on nonpharmacologic measures, such as a balanced diet, adequate calcium and vitamin D intake, adequate exercise, smoking cessation, avoidance of excessive alcohol intake, and fall prevention. Management strategies involve identifying those at risk of fracture, followed by reducing modifiable risk factors through lifestyle changes and, if indicated, pharmacologic therapy.

Exercise:
Resistance exercise can stimulate an increase in bone formation in younger adults and can slow bone loss in middle age. [273]

A 6-month RCT showed that exercise training was effective in improving bone density in older women with low bone density. [274]
- A 2-year training program was also shown to be effective in attenuating the rate of bone loss in osteopenic women. [275]

A systematic review of 28 RCTs of the effects of exercise on health related fitness in postmenopausal women included 16 trials that reported the effects of exercise on BMD. [276]
- Based on these studies, early postmenopausal women would benefit from 30 minutes of daily moderate walking in one to three bouts combined with a resistance training program twice a week to preserve BMD and increase muscle strength.

A Cochrane review of the effectiveness of exercise therapy at preventing bone loss and fractures in postmenopausal women yielded 18 RCTs. [277]
- Aerobics, weight bearing and resistance exercises were all effective on the BMD of the spine.
- The analyzed results showed walking to be effective on both BMD of the spine and the hip.
- Aerobic exercise was effective in increasing BMD of the wrist.

Exercise – Walking
A systematic review of 8 RCTs and non-RCTs of the effects of walking programs on bone mineral density (BMD) at the hip and spine in postmenopausal women found no significant effect on lumbar spine bone density but significant positive effects at femoral neck. [278]

Another meta-analysis of walking interventions in postmenopausal women and men and women aged 50 years and older found that walking had a significant positive effect on lumbar BMD but not on the femur or the calcaneus. [279]
- Suggests that other forms of exercise be combined with walking for patients at risk for osteoporotic fracture.

High Intensity Resistance Training – Postmenopausal Women
A systematic review of the effects of progressive, high-intensity resistance training on bone mineral density (BMD) in postmenopausal women found that: [280]
- At the lumbar spine (LS), 14 RCT study groups were homogenous in demonstrating a significant increase in BMD of 0.006 g/cm(2).
- At the femoral neck (FN), in contrast, there was marked heterogeneity within 11 RCT study groups, but still a positive change in BMD of 0.010 g/cm(2).
- Subgroup analyses showed variability of BMD responses to resistance training based on participants’ hormone therapy use.
- Treatment effects for study groups increasing all participants’ calcium intake showed significant positive BMD changes at hip (P=0.007).

Another systematic review of resistance exercise programs in postmenopausal women yielded 20 studies and showed that weight training exercises were effective at increasing BMD of the spine and hip in postmenopausal women with osteoporosis. [281]
- The increases are site-specific and require high loading with a training intensity of 70% to 90% of 1 RM for 8 to 12 repetitions of 2 to 3 sets performed over one year duration.

High Intensity Resistance Training – Premenopausal Women
A similar analysis in premenopausal women found that high-intensity progressive resistance training was effective in increasing absolute BMD at the lumbar spine but not the femoral neck. [282]

- The weighted mean difference (WMD) for six controlled trials investigating the lumbar spine BMD change was 0.014 g/cm(2).
- In contrast, studies evaluating femoral neck BMD changes showed no significant BMD change (WMD 0.001 g/cm(2)).
- The quality of included studies was quite low, so the modest treatment effects in premenopausal women may be biased and should be interpreted with caution.

**Women with functional hypothalamic amenorrhea**

- Women with functional hypothalamic amenorrhea (FHA) may not achieve peak bone mass (PBM), which increases the risk of stress fractures, and may increase the risk of osteoporotic fractures.
- A systematic review of RCTs, cross-sectional studies, and case studies of the effects of pharmacological and non-pharmacological interventions on bone mineral density (BMD) or bone turnover in women with FHA showed that the most successful, and indeed essential strategy for improving BMD in women with FHA is to increase caloric intake such that body mass is increased and there is a resumption of menses. [283]

**P. DEPRESSION**

**Exercise**

- Exercise seems to improve depressive symptoms in people with depression, to a similar degree as cognitive therapy.
- A Cochrane review of exercise interventions for depression yielded 25 RCTs that together showed a large clinical effect. However, when just the 3 highest quality trials were included the effect was only moderate. [284]
- A meta-analysis of the effects of exercise on depression in the elderly found that exercise was effective in treating depression and reducing depressive symptoms in the short-term. [285]
- An earlier systematic review and meta-regression analysis of the effectiveness of exercise as an intervention for depression concluded that, when compared with no treatment, exercise reduced symptoms of depression (-7.3 points on the Beck scale); the effect was greater with shorter follow up. [286]

**Self Help**

A number of self-help interventions have promising evidence for reducing subthreshold depression.

- The evidence was evaluated in a systematic review of 38 interventions; the best evidence was for relaxation training, exercise, and pleasant activities (along with S-adenosylmethionine, St John's wort, bibliotherapy, computerized interventions, distraction, sleep deprivation, and light therapy). [287]
- A survey of patients found that many self-help strategies rated as strongly as professionally recommended strategies, with exercise being rated extremely highly. [288]
- For patients who do not respond to initial medication treatment, treatments such as exercise, light therapy, alternative medicines, and counseling have demonstrated benefits over placebo and may enhance remission rates when used in combination with antidepressants. [289]

**Q. FIBROMYALGIA**

**Multi-Component Lifestyle Therapy**

There is growing evidence that a combination of interventions (i.e., exercise combined with education and psychologically-based interventions) is the most promising means of managing patients with fibromyalgia (FM). [290]

A systematic review of the efficacy of multicomponent treatments (at least 1 educational or other psychological therapy with at least 1 exercise therapy) yielded 9 RCTs (1,119 subjects) and found “strong” evidence for beneficial short-term effects on the key symptoms including reducing pain, fatigue, depressive symptoms, and limitations to health-related quality of life (HRQOL) and improved self-efficacy for pain control and physical fitness. [291]
But only the positive effects on fitness were maintained in the long term (median follow-up 7 months).

**Exercise**

Most authors report a beneficial effect of aerobic exercise training for fibromyalgia patients with chronic pain or fatigue. [292]
- Muscular rehabilitation is useful for preventing deconditioning and the vicious cycle of pain, avoidance and inactivity behaviors, kinesiophobia, and psychological distress.

A 2003 systematic review of exercise in patients with fibromyalgia found that low-intensity aerobic exercise, such as walking or pool exercise, can improve function, distress and symptoms. [293]
- Strength training can improve strength without exacerbating symptoms.
- Patients tolerated low-intensity exercise well, but high-intensity exercise requires caution.

In 2007 a Cochrane Review Group published a systematic review of 34 studies found “strong” evidence for supervised aerobic exercise training on physical capacity and FMS symptoms. [294]
- Strength training had benefits on some FMS symptoms, but too few studies

A subsequent 2008 review of 6 aerobic studies provided “moderate” evidence that aerobic-only exercise training at ACSM-recommended intensities has positive effects on global well-being and physical function and possibly on pain and tender points. [295]

The Ottawa Panel recommends both aerobic and strengthening exercises for the management of fibromyalgia as a result of the emerging evidence from their synthesis of evidence from 13 RCTs/3 CCTs for aerobic exercise and 5 RCTs for strengthening exercises in the management of fibromyalgia. [296,297]

**R. CHRONIC FATIGUE SYNDROME (CFS)**

Debate exists among health care professionals and patients about appropriate strategies for managing chronic fatigue syndrome (CFS). A systematic review of interventions for the treatment or management of CFS found 44 studies meeting inclusion criteria, including 36 RCTs. [298]
- Studies were grouped into 6 categories. Graded exercise therapy and cognitive behavioral therapy showed the most promising results with high quality evidence. There was insufficient evidence for pharmacological, supplements, immunological, complementary/alternative, and other interventions.

**Exercise:**

A Cochrane review of 5 studies that that investigated exercise therapy for CFS found that, at 12 weeks, those receiving exercise therapy were less fatigued than the control participants (SMD -0.77). [299]
- Physical functioning was also significantly improved with exercise therapy (SMD -0.64), and depression was also improved (although non-significantly) (WMD -0.58).
- Authors concluded that there is encouraging evidence that some patients may benefit from exercise therapy and no evidence that exercise therapy may worsen outcomes.
- Using evidence from both the biological and clinical sciences, they found that graded exercise therapy is safe in people with CFS with no detrimental effects on the immune system.
- Exercise programs should be designed for individual physical capabilities and should take into account the fluctuating nature of symptoms.

**Self Management:**

- Self-management for people with chronic fatigue syndrome involves encouraging patients to pace their activities and respect their physical and mental limitations, with the ultimate aim of improving their everyday functioning. [300]
A meta-analysis of interventions designed to improve health behaviors including exercise among adults with type 1 diabetes included data from 1435 subjects showed that behavior change interventions improve metabolic control in type 1 diabetes. [301]
- There was an overall reduction of 0.33 in mean HbA1c levels between treatment (8.47%) and control (8.80%) groups.

T. NON ALCOHOLIC FATTY LIVER DISEASE (NAFLD)
Lifestyle Modifications
A review of studies testing weight loss and lifestyle modifications for the treatment of NAFLD yielded only 14 studies that met entry criteria. [302]
- Only 3 studies included treatment that was consistent with the guidelines of behavior therapy to reduce excess nutrition and increase exercise; in these studies, a remarkable effect on weight loss and an improvement in liver histology were reported, but the quality of evidence was weak.

U. MULTIPLE SCLEROSIS (MS)
Exercise
A meta-analysis of the effect of exercise training on quality of life (QOL) among people with MS yielded 13 studies meeting inclusion criteria. [303]
- The cumulative evidence supports that exercise training is associated with a small improvement in QOL in individuals with MS.

V. PARKINSONS DISEASE (PD)
Exercise
- A Cochrane systematic review of 7 studies evaluating the effectiveness of physical exercise on mortality, strength, balance, mobility, and activities of daily living (ADL) for sufferers of Parkinson's disease (PD) showed that exercise improves physical performance and activities of daily living in PD patients. [304]

W. COGNITIVE IMPAIRMENT/DEMENTIA
Exercise
- A meta-analysis of 30 trials investigating exercise for people with dementia and related cognitive impairments found that exercise training can increase fitness, physical function, cognitive function, and positive behaviors in people with dementia and related cognitive impairments. [305]

X. CHRONIC LOW BACK PAIN
Exercise
A systematic review of the effectiveness of exercises in decreasing LBP incidence, intensity and impact yielded 15 studies that provided strong evidence that exercise was effective in reducing the severity and activity interference from LBP. [306]
- Another systematic review of the effectiveness of therapeutic aquatic exercise in the treatment of low back pain included 37 studies. There was sufficient evidence to suggest that therapeutic aquatic exercise is potentially beneficial to patients suffering from chronic low back pain and pregnancy-related low back pain. [307]
- A Cochrane review of the effect of unloaded movement facilitation exercises on outcomes for people with nonspecific chronic low back pain yielded 6 high-quality RCTs. [308]
- There was strong evidence that unloaded movement facilitation exercise, compared to no exercise, improves pain and function. Effects are comparable to other types of exercise, including effort-intensive strengthening and time-intensive stabilization exercise.
- McKenzie therapy, a form of unloaded movement facilitation exercises, was favored over intensive trunk strengthening for pain.
- Yoga produced comparable effects for pain as trunk strengthening and function.
- This challenges the role of strengthening for NSCLBP.

American College of Preventive Medicine
A synthesis of systematic reviews of nonpharmacologic therapies for chronic low back pain concluded that there is good evidence that cognitive-behavioral therapy, exercise, spinal manipulation, and interdisciplinary rehabilitation are all moderately effective for chronic or subacute (>4 weeks’ duration) low back pain. [309]

V. PRACTICE PATTERNS RELATED TO LIFESTYLE MEDICINE

Despite consistent recommendations from the most respected medical associations over the last decade, clinician practices regarding lifestyle medicine have not improved much. [1,2]

- Research has consistently reported that the majority of clinicians do not routinely screen or assist patients in modifying their health damaging behaviors. [3-13]
- Only 1 in 8 primary care physicians was even aware of the ACSM recommendations for physical activity. [14]

ADVICE AND COUNSELING

Smoking
- About half (48%) of smokers reported that healthcare professionals had advised them to quit in the past 12 months but only about 1 in 4 were offered assistance in quitting. [15]

Diet and Exercise
- Only 1 in 3 patients indicated that they had ever received even simple advice to increase activity. [16,17]
- The same proportion of hypertensive patients (1 in 3) was counseled about physical activity to help manage their hypertension. [17a]
- The 2000 National Health Interview Survey (NHIS) showed that fewer than 1 in 4 respondents received any physician advice on diet and exercise (21.3% and 24.5% respectively). [18]
- Even in higher risk, rates are low -- from 1992-2000, diet and physical activity counseling took place in < 45% and 30%, respectively, of primary care visits by adults with hyperlipidemia, hypertension, obesity, or diabetes mellitus. [8]
- A review of general practitioner records form 42 practices showed that only half of patients with PAD received advice about exercise or had their body mass index checked. [18a]
- A chart review of 105 randomly selected patients with knee OA showed that fewer than 3 out of 5 had been advised to do any kind of exercise, only half of overweight had been advised to lose weight, and only 2 in 5 had been told about the benefits of strengthening exercise. [18b]
- Likelihood of receiving exercise counseling decreases with age. Of adults > 45 years, men aged 45-54 were most likely to receive exercise counseling from their PCP, but still just over 1 in 5 received such assistance. [19]
- Women >75 years were least likely -- fewer than 1 in 10 received exercise counseling.
- Low rates of counseling were substantiated by observations of patient visits in 38 primary care practices by trained medical students -- physicians counseled on dietary habits in 1 in 4 visits and exercise in 1 in 5 visits; new patients were counseled more often than established ones; counseling was more frequent when there were diet and exercise brochures in the office. [20]
- 9 in 10 internal medicine residents were confident in their knowledge of exercise, but only 1 in 4 was confident in counseling patients. [21]
- Physicians counsel diabetic patients more frequently than those in a pre-diabetic state. Among Swiss primary care physicians, 91% of their diabetic patients received counseling for dietary changes and 79% for physical activity. However, the rates for pre-diabetic patients was 66% and 60%, respectively. [40]

Weight Loss
- Only 2 of every 5 obese patients are advised to lose weight in regular exams, even when they have chronic conditions made worse by their weight. [22-29]
- Even fewer (< 1 in 4) overweight (not yet obese) had discussed weight with their physician. [30]
- Even when they advise patients to lose weight, physicians often provide insufficient guidance on weight management strategies, possibly because of inadequate counseling skills and confidence. [31]
- Patients were more likely to receive information on the benefits of weight loss, but only 1 in 3 received specific weight control advice, and 1 in 4 were advised to increase physical activity. [32]
- Women more likely than men to be counseled – only 1 in 4 men vs. 2 in 5 women. [33]
- Even with obesity-related co-morbidities, weight loss counseling occurred in only half of visits. [34]

**Advice alone is not enough.**
- It takes more than simple advice to change behaviors. The challenge remains converting awareness into behavior change. [16]
- Simple advice to increase physical activity was not enough to produce long term changes in activity patterns. [35]

**Adequacy of Counseling**
Counseling is most effective when physicians present counseling as a plan or prescription and follow up with the patient on it.
- Overweight adults who were advised to exercise, and provided a plan, were nearly 5 times as likely to meet physical activity recommendations. [36]
- Patients who recalled being counseled to lose weight were more likely to understand the risks of obesity, the benefits of weight loss, and were at a higher stage of readiness for weight loss. [31]

But when counseling is given, it often does not include a specific plan.
- Only 1 to 5 of every 20 obese patients was given specific fat loss counseling, especially a plan that includes an increase in physical activity. [31,32,37]

**Patients want more counseling**
Most patients (especially overweight or obese) want more help than they are getting. [38]
- Obese women report much less satisfaction with obesity care than general health care.
- Almost half reported that they had not been given a weight loss strategy, and 3 out of 4 indicated they expected only a "slight amount of help" or "none at all" when it came to weight control. [39]

**VI. THE NEED FOR COMPETENCE IN LIFESTYLE MEDICINE**

Greater physician competence in lifestyle medicine might carry with it a number of positive downstream effects. It could:

**Change the image of lifestyle medicine – a central role in managing chronic disease.**
- A culturally competent, patient-centered approach with interventions tailored to each patient’s unique medical, psychological, and socio-cultural situation.
- Change the orientation to a chronic care perspective – a long term, on-going process; the Chronic Care model presents a guide for making this change. [1]
- Treatment plans focused on entire risk factor profile rather than on isolated risk conditions.
- The use of registries, multidisciplinary teams, community outreach, interventions that address care transitions, and telephonic outreach have all been shown to improve the quality of care for conditions such as hypertension, hyperlipidemia, diabetes, and coronary artery disease. [2]

**Enable the practitioner to develop a profitable practice using lifestyle medicine for some or all patients.**

American College of Preventive Medicine 44
Increase demand for training in delivering lifestyle interventions.

- The scientific foundation for using diet and lifestyle as a preventive and curative tool.
- Writing lifestyle prescriptions tailored to the unique needs of individual patients and conditions.
- Provide training to address common misconceptions and questions about exercise, diet, weight loss, stress management, sleep and so on.
- Overcome time barriers by providing guidelines for brief consults, such as the use of the 5A protocol. [3]
- The kinds of support, coaching, and education required to affect meaningful patient change can be accomplished in as little as a few minutes per visit. [4-6]
- Address the vital role of negative emotions that undermine changing behaviors and adhering to regimens. [7-13]
- How to assess and address health literacy issues that affect nearly half of U.S. adults. [14]
- Few physicians systematically assess health literacy and psychological co-morbidities. [15-17]

Help overcome clinician biases. [18,19]

- For the clinician: biases against obese, minorities, etc.; misconceptions regarding interventions, patient motivation and ability to change if given the proper program and support, etc.
- Help overcome prevailing cynicism regarding the average patient’s readiness and ability to change well established behavior patterns. [20,21]
- Physicians typically more pessimistic, often underestimate patient motivation. [22]

Address patient misconceptions

- Tendency to underrate vulnerability (i.e., optimistic bias) that lowers readiness to change. [23]
- Tendency to overestimate degree of change needed (e.g., amount of weight loss or exercise).
- Emphasize a sense of partnership between clinicians and patients; better relationships and more intensive support helps change patient perceptions. [24]

Promote proven behavior change strategies.

- The art of patient counseling and coaching, the use of motivational interviewing, counseling based on stage of readiness, dealing with barriers, relapses.
- Time, effort and resources necessary for behavior change are often overestimated. [21]
- Physicians’ poor self efficacy and lack of training in behavior change has been shown to obstruct the implementation of lifestyle interventions in primary care. [25-29]
- Many studies have reported the lack of preparation and confidence to manage obese patients. [30-33]
- Communication -- how to discuss issues (e.g., weight) in a way that makes patients feel comfortable and increases confidence and motivation to make changes. [34]
- Assessing psychological comorbidities, address health literacy skills, and clarify patient’s understanding of messages. [35]
- Re-defining successful outcomes in terms of healthier behaviors. [36]
- Interrupting a “quitting is not an option” attitude in patients, how to use relapses to increase commitment. [4-6]

Increase the use of office systems that integrate lifestyle interventions into routine practice.

- A useful model provides a 4-step plan, beginning with diagnosis and assessment, followed by a series of patient centered counseling sessions in 3-5 minute segments, to guide patients through the behavior change process. [37,38]
- Considerable effort has gone into developing and testing systems that prompt communications, screening, interventions and follow-up to improve the delivery of appropriate counseling. [39,40]
- Develop leadership for integrating these systems in a step by step plan.
- Assessing current practice needs, as well as ongoing needs (e.g., additional training)
Developing a coordinated care system that involves a team approach, with staff training to carry out interventions.

Development of patient roadmaps for assessment, monitoring lifestyle changes, facilitating off site care, delivery of tailored advice, follow-up, and linking to support and assistance at home.

Staff training protocols that support the practice by teaching necessary skills for diet and lifestyle improvement.

Lead to practitioners better informed of the latest guidelines and evidence.

- Keeping up with clinical information on LM is an insurmountable task for the average clinician; evidence is overwhelming. [41]
- Providing continuing education opportunities, such as offered by the ILM to keep abreast of best practices. [http://www.institutelifestylemedicine.net/home.html]

Build stronger ties between physician and community.

- Establishing community partnerships, teams with other health professionals in the community
- Becoming a community advocate for LM
- Linking to community resources and programs to offer additional opportunities to receive support and reinforce healthy lifestyle messages.

Provide a bridge for extending clinical trial findings into every day clinical practice.

- A perception that rigorous studies, e.g. Ornish program, do not reflect real world practice has been cited as part of the resistance to implementing evidence-based strategies. [42-45]
- Provide a foundation for instituting trials in actual practice settings. [46,47]
- Integrating evidence-based lifestyle interventions into individual practices requires a process for incorporating and maintaining the strategies and interventions over time. [38,46,49]

Sets the stage for advocacy, on issues such as reimbursement.

- Lack of reimbursement is a huge barrier. Lifestyle change is a long, time consuming process that is much less likely to happen if services are not reimbursed. [50-52]
- Make behavior change the focus of visits. Relate the lifestyle issue to a specific risk factor or chronic disease. Counseling is more likely to occur when patients make the issue the reason for the visit or explicitly ask for help, OR clinicians view the lifestyle issue (e.g., excess weight) as an exacerbating factor, i.e., “medicalizing” the issue. [53-55]

In order to achieve greater competence among physicians, interested parties must work together to establish a set of competencies against which practitioners of lifestyle medicine can be measured.

VII. ORGANIZATIONS AND INITIATIVES

ORGANIZATIONS INVOLVED IN LIFESTYLE MEDICINE

This list is not meant to be all-encompassing. However it includes organizations’ lifestyle medicine-related activities such as quality improvement programs, patient education campaigns, office-level interventions, public awareness campaigns and research to evaluate efficacy of these projects.

American Academy of Family Physicians (AAFP)
http://www.aafp.org/
Physician specialty society representing Family Physicians
Activities include:
- Americans in Motion
  - Multifaceted program that encourages increased physical activity
    - Patient educational materials
    - Physician office tools
    - Cluster randomized controlled evaluation trial of AIM’s efficacy
• In-school educational program
  • *Ask and Act*
    • Comprehensive smoking cessation support program featuring patient and physician tools
  • *Tar Wars*
    • Tobacco-free education program and poster contest targeted at fourth- and fifth-grade students.

**American Academy of Pediatrics (AAP)**
http://www.aap.org
Physician specialty society representing pediatricians. Activities include:
• The AAP has set a high priority on addressing overweight and obesity among children.
  • Grant programs
    • AAP administers numerous grant programs such as the *Mentorship and Technical Assistance Program, Community Access to Child Health, Healthy Tomorrows,* and the *Healthy People 2010 Chapter Grant Program.* Many grants have supported nutrition and exercise initiatives to prevent and treat childhood overweight/obesity.
  • Research
    • *Healthy Lifestyles Pilot Study,* designed to evaluate an office-based intervention’s efficacy at improving eating and activity patterns and stabilizing weight gain of children at risk for obesity.
    • *Brief Motivational Interviewing to Reduce Body Mass Index,* a 2-year randomized controlled trial to evaluate the efficacy of an intensive counseling program to improve diet and exercise among overweight children
    • *Periodic survey* of clinical practice in overweight/obesity management
  • *Healthy Grandfamilies*
    • AAP serves as consultant on community programs that work with grandparents to reinforce healthy nutrition and physical activity among their grandchildren
• *Children, teens and resiliency*
  • Website provides educational resources for parents and an interactive application that allows teens to design their own stress management plan.

**American College of Osteopathic Family Physicians**
http://www.acofp.org
Physician professional society representing osteopathic family practitioners
• Based in Arlington Heights, IL

**American College of Physicians (ACP)**
http://www.acponline.org
Physician specialty society representing internists. Activities include:
• *Diabetes Portal*
  • Online repository of diabetes treatment and prevention resources including those on diet, physical activity and smoking cessation
  • Materials include patient educational materials, workbooks, checklists and physiologic calculators; and Physician Information and Education Resource, a decision support system that provides recommendations on non-Drug therapy.

**American College of Preventive Medicine (ACPM)**
http://www.acpm.org
Specialty society representing preventive medicine physicians
• *Health and Fitness Institute*
  • Day-long consumer education events designed to promote healthy eating, physical activity and healthy responses to stress.

**American Medical Association (AMA)**
http://www.ama-assn.org
Physician professional society whose membership includes all physician specialties. The Promoting Healthier Lifestyles initiative comprises related activities.

- **Healthier Life Steps™**
  - Program promotes healthy behaviors regarding diet, physical activity, alcohol consumption, and tobacco use.
  - Features a toolkit with patient assessment questionnaire, action plans, and progress tracking calendars.

- **Program on Aging and Community Health**
  - Features office tools to guide physicians and older patients on making lifestyle-related behavioral changes.

- **Roadmaps for Clinical Practice: Assessment and Management of Adult Obesity**
  - Tools to address obesity including office decision support tools and checklists.

- **Secondhand Smoke Performance Improvement**
  - Offers grants to practices for implementing Performance Improvement measures to increase counseling related to second-hand smoke.

**American Osteopathic Association (AOA)**
http://www.osteopathic.org/

Physician professional society of practitioners of osteopathic medicine – a discipline devoted to a “whole person” approach to medical care.
- Founded in 1897, now based in Chicago, IL

**American Osteopathic College of Occupational and Preventive Medicine**
http://www.aocopm.org/mc/page.do

Physician professional society representing osteopathic occupational and preventive medicine physicians.
- Founded 1979 based in Jackson, MI
- Its goal is “to create better understanding of the relationship of health and prevention in regard to the wellness of the population.”

**American College of Lifestyle Medicine (ACLM)**
http://lifestylemedicine.org/

The first national medical specialty society for healthcare professionals who utilize lifestyle interventions as the primary therapeutic tool in the treatment and management of disease.
- Members engaged in practice, teaching, and research on all levels and in various areas of healthcare.
- Seeks to get better, more effective healthcare by developing the emerging medical specialty of Lifestyle Medicine.
- The organization is based at Loma Linda University.

**American Society of Nutrion (ASN)**
http://www.nutrition.org/

Professional society representing nutrition researchers.
- Its goals include promoting nutrition research, education and practice.

**American College of Sports Medicine (ACSM)**
http://www.acsm.org

Interdisciplinary professional society devoted to advancing healthy lifestyles through sports medicine and exercise science.
- World’s largest sports medicine and exercise science organization.
- Founded in 1954, based in Indianapolis, IN.
- **Exercise is Medicine**
  - Initiative that aims to make physical activity a standard part disease prevention and medical care.
  - Offers toolkits for providers, fitness professionals, the public, and public service announcement campaigners.

**Institute of Lifestyle Medicine (ILM)**

American College of Preventive Medicine
http://www.institutelifestylemedicine.net/home.html
Mission is to reduce lifestyle-related disease and mortality through physician-directed interventions.
- Part of the Department of Physical Medicine & Rehabilitation at Harvard Medical School
- Has established partnerships with several organizations including the American College of Sports Medicine, WellCoaches, Apollo Hospital Group (WellnessRx), and others.
- Teaches health professionals how to deliver health promotion messages in an effective and efficient manner and how to improve their personal lifestyle choices so that they can be optimally effective role models for their patients.
- Provides educational materials, educational tools, coaching and training services and CME courses.
- Consults with major hospitals and corporations providing exercise and wellness prescription tools in clinical settings.

Lifestyle Center of America (LCA)
http://www.lifestylecenter.org
Nonprofit organization that helps diabetes patients with lifestyle interventions involving plant-based nutrition, physical activity, and individualized action plans.
- Founded in 1996 by the nonprofit Ardmore Institute of Health, based in Sulphur, OK
- Activities include multiple patient self-management and empowerment programs including telephone health coaching and a 5-day residential program
Note: Lifestyle Center of America has provided funding for this literature review.

Lifestyle Medicine Association (LMA)
http://lifestylemedicineassociation.com
http://www.lifestylemedicineinitiative.com/partners.php
A national membership organization healthcare professionals and members of the public. Its mission is to advance the field of Lifestyle Medicine and to promote these practices throughout the healthcare system.
- A partnership between SAGE Publications and Dr. James Rippe and his research and clinical organization, Rippe Health.
- Offers a variety of educational opportunities including its journal, the American Journal of Lifestyle Medicine, as well as an annual conference for members.

Rippe Lifestyle Institute (RLI)
http://www.rippehealth.com/rippelifestyle/index.html
http://www.lifestylemedicineinitiative.com/what_is_lifestyle_medicine.php
- Founded with the vision of becoming not only the leading organization performing research but also the leading organization communicating the ways daily lifestyle habits and practices affect health.
- The Lifestyle Medicine Initiative from Rippe Lifestyle Institute offers evidence based protocols and guidelines to assist physicians in the application of Lifestyle Medicine principles into both prevention and management of many of the common chronic conditions seen in a modern medical practice.

VIII. REFERENCES BY SECTION

I. DEFINITIONS AND DIFFERENTIATION

II. REIMBURSEMENT TRENDS

III. CURRENT STATUS OF LIFESTYLE MEDICINE


79. Centers for Disease Control and Prevention. QuickStats: Percentage of Adults Aged >18 Years Who Consumed Five or More Alcoholic Drinks in 1 Day at Least Once in the Preceding Year, by Sex and Age Group --- National Health Interview Survey, United States, 2007. MMWR 2008;57(49);1333.


81. Centers for Disease Control and Prevention. QuickStats: Percentage of Adults Aged >18 Years Who Reported an Average of ≤6 Hours of Sleep per 24-Hour Period, by Sex and Age Group --- National Health Interview Survey, United States, 1985 and 2006. MMWR 2008;57(08);209.


85. NHANES III, 1988-94


99. Lifestyle Medicine Review


IV. EVIDENCE FOR LIFESTYLE INTERVENTIONS – TREATING CHRONIC DISEASE

OBESITY


26. Jakicic et al., JAMA 1999


HYPERTENSION
42. JNC VII, NHLBI, 2003
43. BPLTTC Lancet 2003; 362:1527-35

DYSLIPIDEMIA
89. Datillo & Kris-Etherton Am J Clin Nutr 1992

METABOLIC SYNDROME / IMPAIRED GLUCOSE TOLERANCE
99. NCEP ATP III

120. Simmons RK, Griffin SJ, Steele R et al. Increasing overall physical activity and aerobic fitness is associated with improvements in metabolic risk: cohort analysis of the ProActive trial. Diabetologia 2008 May;51(5):787-94.


130. Esposito K, Marfella R, Ciottola M et al. Effect of a Mediterranean style diet on endothelial function and markers of vascular inflammation in the metabolic syndrome: a randomized trial. JAMA 2004; 292: 1440-6


139. McNaughton SA, Mishra GD, Brunner EJ. Dietary Patterns, Insulin Resistance, and Incidence of Type 2 Diabetes in the Whitehall II Study. Diabetes Care 2008; 31:1343-1348


TYPE 2 DIABETES


CARDIOVASCULAR DISEASE


STROKE

HEART FAILURE

INTERMITTENT CLAUDICATION

PERIPHERAL ARTERIAL DISEASE

COPD

OSTEOPOROSIS


246. Dieppe P., Brandt K. What is important in treating osteoarthritis? Whom should we treat and how should we treat them? Rheum Dis Clin N Am. 2003;29: 687-716


RHEUMATOID ARTHRITIS


CANCER


OSTEOPOROSIS


DEPRESSION


FIBROMYALGIA


CHRONIC FATIGUE SYNDROME


DIABETES TYPE I

NAFLD

MS

PARKINSON’S

COGNITIVE IMPAIRMENT

CHRONIC LOW BACK PAIN

V. PRACTICE PATTERNS RELATED TO LIFESTYLE MEDICINE
http://www.prevent.org/content/view/129/72/#highlights


19. Centers for Disease Control and Prevention. QuickStats: Estimated Percentage of Patients Aged >45 Years Who Received Exercise Counseling From Their Primary-Care Physicians, by Sex and Age Group --- National Ambulatory Medical Care Survey and National Hospital Ambulatory Medical Care Survey, United States, 2003--2005. MMWR 2007;56:43(1142).


VI. PROS/CONS OF STANDARDIZATION OF LIFESTYLE MEDICINE


42. Klesges L, Dzewaltowski D, Christensen A. Are we creating relevant behavioral medicine research? Show me the evidence! Ann Behav Med. 2006;31:3-4.


49. Terre L. Cardiovascular risk reduction: we have the will but do we have the way? Am J Lifestyle Med. 2007;1:34-37


## Appendix: Evidence Chart (Added July 24, 2009)

**Evidence supports a positive effect on health outcomes**

<table>
<thead>
<tr>
<th>Target patient behaviors</th>
<th>A. Obesity</th>
<th>B. Hypertension</th>
<th>C. Dyslipidemia</th>
<th>D. Impaired Glucose Tolerance Syndrome</th>
<th>E. Type 2 Diabetes</th>
<th>F. Cardiovascular Disease</th>
<th>G. Stroke</th>
<th>H. Heart Failure</th>
<th>I. Peripheral Artery Disease</th>
<th>J. Chronic Obstructive Pulmonary Disease</th>
<th>K. Rheumatoid arthritis</th>
<th>L. Breast Cancer</th>
<th>M. Cancer – All</th>
<th>N. Prostate Cancer</th>
<th>O. Osteoporosis</th>
<th>P. Fibromyalgia</th>
<th>Q. Chronic Fatigue Syndrome</th>
<th>R. Type 1 Diabetes</th>
<th>S. Type 2 Diabetes</th>
<th>T. Non-alcoholic fatty liver disease</th>
<th>U. Multiple Sclerosis</th>
<th>V. Parkinson’s</th>
<th>W. Cognitive Impairment/Dementia</th>
<th>X. Chronic Low Back Pain</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exercise</td>
<td>X</td>
<td>X</td>
<td>O</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>O</td>
<td>X</td>
<td>O</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>O</td>
<td>O</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
</tr>
<tr>
<td>Diet/nutrition</td>
<td>X</td>
<td>X</td>
<td>O</td>
<td>X</td>
<td>X</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
</tr>
<tr>
<td>Stress reduction</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Smoking cessation</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Alcohol moderation</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Multiple Behaviors</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>O</td>
<td>O</td>
<td>X</td>
<td>X</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>O</td>
<td>O</td>
<td>O</td>
<td>O</td>
</tr>
</tbody>
</table>
In the study, 39% of patients who were overweight by BMI standards fell into the obese category for body fat percentage.

**STORY HIGHLIGHTS**

- BMI, researchers say, may be an overly simplistic measure for overall health
- BMI threshold for obesity should be lowered to 24 for women and 28 for men, authors say
- Authors: Patients who are not considered obese aren't being told about their health risks

(Health.com) -- Doctors and health officials have relied for decades on body mass index (BMI), a ratio of height to weight, to categorize people as overweight and obese. A new study, however, suggests the use of BMI may be leading us to underestimate the already sky-high obesity rate.

BMI, the researchers say, is an overly simplistic measure that often misrepresents physical fitness and overall health, especially among older women. Nearly 4 in 10 adults whose BMI places them in the overweight category would be considered obese if their body fat percentage were taken into account, according to the study.

"Some people call it the 'baloney mass index,'" says lead author Eric Braverman, M.D., president of the Path Foundation, a nonprofit organization in New York City dedicated to brain research. Bodybuilders can be classified as obese based on their BMI, he says, while "a 55-year-old woman who looks great in a dress could have very little muscle and mostly body fat, and a whole lot of health risks because of that -- but still have a normal BMI."
Based on their findings, Braverman and his coauthor, New York State Commissioner of Health Nirav Shah, M.D., say the BMI threshold for obesity, which now stands at 30, should be lowered to 24 for women and 28 for men.

By that standard, a 5-foot 6-inch woman and a 5-foot 11-inch man would be considered obese at about 150 and 200 pounds, respectively.

The study participants -- patients at a specialized private health clinic in Manhattan -- aren't typical of the population as a whole, Braverman notes. Still, he says, the large discrepancy between BMI and body fat measures seen in the study suggest that BMI guidelines should be revisited.

"People aren't being diagnosed [as obese], so they're not being told about their risk of disease or being given instruction on how to improve their health," says Braverman, who is also a clinical assistant professor of neurosurgery at Weill Cornell Medical College, in New York City.

James Hospedales, M.D., chief of noncommunicable diseases at the Pan American Health Organization, a division of the World Health Organization based in Washington, D.C., says that while one study is not enough to justify changing national standards, the findings do call for a discussion.

"We've known for a long time that BMI is not a perfect measurement, and that it's important to look at the overall picture," Hospedales says. "In this study, it turns out that a lot of people who are classified as just overweight in fact have a bit more to worry about, and those are indeed valuable findings."

But lowering the cutoff for obesity could create its own problems, Hospedales adds.

"We'd also be calling an increasing number of people obese who aren't, which could lead to issues with stigma, insurance policies, and other problems," he says. "We have to think quite carefully about the pros and cons."

In the study, published today in the journal PLoS One, Braverman and Shah compared the BMI of roughly 1,400 men and women with their body fat percentage, which was measured using a type of scan, known as dual energy X-ray absorptiometry (DXA), that provides a detailed breakdown of fat, muscle, and bone mass. (DXA scans are also used to measure bone density.)
Overall, 39% of patients who were merely overweight by BMI standards fell into the obese category for body fat percentage, which the American Society of Bariatric Physicians defines as 25% or more for men and 30% or more for women. BMI appeared to provide a far less accurate picture among women, possibly because women lose muscle mass faster than men as they age, the study notes. Nearly half of the women were considered obese according to body fat percentage but not BMI, compared to just one-quarter of the men.

Health.com: Mistakes women make in middle age
Testing for blood levels of the hormone leptin could boost the usefulness of BMI, the study suggests. Leptin, which helps regulate energy and appetite, was strongly associated with body fat percentage in the study, and it has previously been linked to obesity-related health complications. Adjusting BMI to account for leptin levels would provide patients with a more accurate measure of their disease risk, Braverman says. Lowering BMI obesity cutoffs, using DXA scans when possible, and incorporating leptin tests represents a "three-pronged approach," Braverman says. "Making these changes now can save the U.S. a fortune down the road, if it allows us to alert more people to their risks and prevent them from getting worse."
Big Pharma is running scared.

Drug companies are rushing into each other's arms these days to unite against some difficult years ahead for the industry. The credit markets are dried up and the political and economic landscape is changing. The mergers are a defensive move as companies find their bottom lines increasingly under assault.

Here are some of the problems drug companies face:

1. **Patents expiring.** Companies need to find replacements as their drugs lose patent protection. Merck's asthma drug, for example, loses its patent in the next few years, according to The Economist. By buying Schering-Plough, Merck will double (to 18) its number of late-stage development drugs.

2. **Obtaining financing.** Yes, even well-established pharmaceutical companies are struggling with finding new capital and restructuring debt.

3. **Costs are too high.** Consolidation allows drug companies to lay off more employees and keep costs in control. Merck is expecting to cut 15% of the positions in the combined company.

4. **Sluggish sales.** People are learning to mistrust BigPharma. Generics have been killing sales of drugs like Fosamax and Zocor for Merck. And cash-strapped consumers are cutting back on spending, even when it comes to their own prescriptions. Analysts have been pressuring Merck to do a major deal in response to falling sales, according to The Associated Press.

5. **Political pressure.** We're still unsure where President Barack Obama's administration is headed in terms of health care, but drug companies may be pressured to offer bigger discounts, according to The Economist.
Mergers are an easy option in times like these, particularly because valuations are so cheap. They don't fix everything, but they address short-term problems and, in this economy, just surviving the next few years is what's important.

Merck investors weren't exactly rejoicing over the news today. Shares were down nearly 8%, while Schering-Plough shares were up about 10%.

**The drug companies have made a fortune off of use all to the point our health has suffered at their expense. It is time that they lower their incomes so that we can survive.**

*Mae Hasty* (Posted 03.09.09 6:48 PM) [Report Abuse]

I don't feel very sorry for these people. They have made alot of money off of people in good years and I find it deplorable that they make $200 pills for various diseases care. i.e cancer. Who can afford that? And when I was told that they found it easier to let someone expire than help them. My blood boiled. I know it costs alot to make, but it doesn't cost that much. It should be cheaper. Period.

If someone can't get a 10 million dollar bonus this year, do you think I care?

I could use a million too.

*Douglas* (Posted 03.09.09 7:02 PM) [Report Abuse]

My 19 year old son pointed out to me, a Nurse- who always believed that we would find a cure for cancer, aids, etc..... "Mom, the drug companies will NEVER let a cure be found because it is more profitable for them to continue to treat the illnesses, EVEN if people die from the disease" I don't know which is sadder, the fact that he, at 19, felt this way about drug companies, or the fact that HE realized it and I didn't.....

*Cathy - Ian's mom* (Posted 03.09.09 8:59 PM) [Report Abuse]

OK for Ian: He is in my catagory where we know the pharmaceutical companies have CONTROLLED the public's knowledge that syntheic drugs hurt ALL people.

Genetic (or NATURAL SUPPLEMENTS) harm very few.

The time has come to close the doors of the Drug Companies.

*Woody* (Posted 03.09.09 9:19 PM) [Report Abuse]

How about a little critical thinking Mae Hasty, Douglas, Cathy-Ian's Mom.....Please Mae Hasty, name for me the soviets & cuban addition to the drug pipeline (w No profit involved). That's because there were none...Doug, perhaps you would like to just "go without" a non profit can CURE the world & Cathy- Ian's Mom, perhaps you could just have your son solve the world's
ills. The bad drug companies (which I guess are all made up of bad people) would never develop the cure for cancer, no one would pay for that, right......Just once I'd love to hear you all wax poetic about "Big Education" after all it HAS risen more than the cost of "Big Pharma". Green Day was right, we are are "American Idiots." Be careful what you wish for...

**Ric** (Posted 03.09.09 9:38 PM) [Report Abuse](#)

No sympathy from me about pharmaceutical companies. They have made millions of dollar at our expense. For instance Type 1 diabetes, providing insulin is one of their biggest sellers, the companies would rather sell the drug than seek a cure.

**Deborah Flickinger** (Posted 03.09.09 9:52 PM) [Report Abuse](#)

Everyone argues about the cost of drugs. However the cost to produce the first pill is close to 1 billion dollars. That is the research and legal fees. The drug companies only have about 10 years to make up the cost and make a profit. The are obviously greedy companies.

**Tony Boca** (Posted 03.09.09 10:41 PM) [Report Abuse](#)

all of you enjoy pharma company bashing and take pride in "knowing" so much about the cures and cost of healthcare. Do you really know anything about these subjects or are you hypothesizing with NO EVIDENCE or facts? Just verbal diarrhea of which there is obviously no cure!!! I work for a small pharma company. We are made up of GOOD people, who worked hard to get their job not like many Americans who expect to get high pay for NOT working hard. What would you say is the answer....we all pick herbs and do our own pharmaceutical experiments?? you all make me sad to be American. Again, it is proof that we dont appreciate the great things we have access to in this country. You're all winers! Like it or not we need medications (that cost a hell of alot to buy and research and develop). Maybe america should wake up and be more healthy by making wiser lifestyle choices. The generic companies are not heroes ...they are taking and stealing a product copycat and selling it cheaper. Tha tis sooooo American isn't it??!! make profit of of others hard work.....educate yourself before you formulate an opinion, and a 19 yr iold doesnt have all the answers even though they think they do!! heeeellllo!!! i know I was one of them before.

**Jennifer** (Posted 03.09.09 10:48 PM) [Report Abuse](#)

Lets see now. The Doctor gets a cut, the drug store get a cut, the sales people get a cut, the sub drug suppliers get a cut and of course we pay the price. The cancer foundation gets billions since 1945 and all you people continue to pay. I am on the wrong side of the fence. So, I also pay. The pharmaceuticals have the Federalis on their side. We cannot run to Canada or Mexico and buy Generics without a have penalty. We are just finacial slaves and on the way to the grave. An ugly pattern to follow. All the people above are certainly right and I wish them well. Thanks for all your time.

**Peter D.** (Posted 03.09.09 11:02 PM) [Report Abuse](#)
President Obama inherited one incredible tsunami economic meltdown in modern history. Factor in lack of cooperation from the Republican party and disingenuous comments that they support and want to work with the President. And at every turn that provide opposition to his strategies, policies, and programs which are design to combat the current economic crisis that we find ourselves connected to as a result of the Bush Administration legacy. Clearly, economic ownership for the country's current contraction and slowdown which is traced back to 2006-2007 has to be laid and firmly connected to poor Republican policies. Most clear thinking people should express outrage towards the Republicans who are now stubbornly undermining every decision and policy President Obama provides for the economic recovery and for curtailing the contraction that should have never happened had only the Republicans not approved the greedy, malfeasances, abusive practices in the past. Ignoring proper oversight, and appropriate regulatory rules which might have help to avoid having the "house on fire" dilemma that President Obama is compelled to provide leadership and solutions.

Nobody asks the simple question 'do synthetic drugs really work vs Placebo, work means promote health not just symptom control addiction". the answer is that they do not the major false belief of our day is that men can make things compatible with nature. Our society has learned that synthetic foods are bad, they produce side effects and disease. The best cook uses the finest quality natural products, he knows the problems of synthetics. Society is waking up to the fact that it is also true for our medicines, but no news service will cover this message. No reporter will cover this, no scientist research this. Money rules. It is questionable if this comment will not be displayed. Nobody researches natural medicines, no one questions the corruption of the drug companies, and the FDA looks the other way as Big tobacco, Big Sugar, and especially Big Pharm kill millions of millions. Medicines should not kill. The FDA focuses on eliminating drugless therapies. That's the problem, nature is the answer. Health care is not for health, it is disease care. Disease is promoted through dependency on synthetic medications, bad diet, smoking, excess stress, and complications from the drugs. The system makes money on disease, not on health. What we have is Disease care Profit care. What we need is this message to be posted, fat chance.

Franklyn Horspet
Science Proves Vegetarians Are More Intelligent than Meat Eaters

Vegetarianism is a crime against nature

Modified from a publication on May 30, 2010 by Satoshi Kanazawa in The Scientific Fundamentalist

Humans are naturally Vegetarians who evolved into omnivores. We are evolutionarily designed to eat plants but we have a system that allows us to eat both animal meat and plants. Anyone who eschewed animal protein and ate only vegetables in the ancestral environment, in the face of constant food scarcity and precariousness of its supply, was not likely to have survived long enough and stayed healthy enough to have left many offspring. So such a person is not likely to have become our ancestors. On the other hand, anyone who preferentially ate animal protein and fat in the ancestral environment would have been much more likely to live longer and stay healthier. They are therefore much more likely to have become our ancestors.
Vegetarianism would therefore be an evolutionarily novel value and lifestyle, as well as a luxury of abundance. The Hypothesis would predict that more intelligent individuals are more likely to choose to become a vegetarian than less intelligent individuals.

See All Stories In

Meat-Free Living

This indeed appears to be the case. Among the British respondents in the National Child Development Study, those who are vegetarian at age 42 have significantly higher childhood general intelligence than those who are not vegetarian at age 42. (Childhood general intelligence was measured with 11 different cognitive tests at three ages before 16.) Vegetarians have the mean childhood IQ of 109.1 whereas meat eaters have the mean childhood IQ of 100.9. The difference is large and highly statistically significant.

The relationship holds both among women and men separately. Among women, vegetarians have the mean childhood IQ of 108.0 while meat eaters have the mean childhood IQ of 100.7. Among men, vegetarians have the mean childhood IQ of 111.0 and meat eaters have the mean childhood IQ of 101.1, a 10-point difference!
The fact that the difference in childhood IQ between vegetarians and meat eaters is larger among men than among women makes sense in light of the historical division of labor between the sexes. Throughout evolutionary history, men have traditionally hunted animals for their meat while women have traditionally gathered plant food. So vegetarianism – a complete and total eschewal of
animal meat – should be even more evolutionarily novel and unnatural for men than for women. Women are 60% more likely to be vegetarians than men are (3.33% vs. 2.07%).

Childhood general intelligence has a significantly positive effect on the likelihood of vegetarianism at age 42, even net of a large number of social and demographic factors, such as sex, whether ever married, whether currently married, education, income, religion, religiosity, social class at birth, mother’s education, and father’s education, both in the full sample and among men and among women separately. There appears very little doubt that more intelligent children are more likely to grow up to become vegetarian as adults in the United Kingdom. One standard deviation (15 points) increase in childhood IQ increases the odds of adult vegetarianism by 37% among women and by 48% among men.

Interestingly, the strong association between childhood intelligence and adult vegetarianism is not replicated in the US. Vegetarians in early adulthood do have significantly higher childhood intelligence in junior high and high school, but the difference is not large (101.5 vs. 99.3). And it is only significant among women (101.4 vs. 98.5), not among men (101.7 vs. 100.1). This is very strange given the historical division of labor noted above. The significant effect of childhood intelligence on adult vegetarianism among Americans disappears entirely once mother’s or father’s education or religion is statistically controlled.
It is not at all clear to me why the difference in childhood intelligence between vegetarians and meat eaters is so much larger and stronger in the United Kingdom than in the United States. Apart from the national differences between the UK and the US, the two samples also come from different generations. The British NCDS respondents were all born in March 1958, whereas the American Add Health respondents were born between 1974 and 1983. I am not sure if it is the national differences or generational differences, or something entirely different, that account for the observed difference in the association between childhood intelligence and adult vegetarianism.
Stress as a Medical Concern

Stress is a medical disease and concern. International Classification of Diseases #9 (ICD#9) lists 308.0 as Acute Reaction to Stress and 308.3 Stress, Acute Situational Disturbance, and ICD#10 lists F43 Reaction to severe stress, and adjustment disorders and F43.0 Acute stress reaction, F43.1 as Post-traumatic stress disorder, F43.2 as Adjustment disorders, F43.8 as Other reactions to severe stress and F43.9 as Reaction to severe stress, unspecified. The opinion of the word “acute” is to be made by the therapist or the patient and is not the responsibility of the manual nor the SCIO².

Biofeedback is a medical therapy for stress. Current Procedural Terminology (CPT) codes for therapy lists 90901 as Biofeedback training by any modality and 9081X as approximately 45-50 minute sessions.

From the ICD listings we see that stress is recognized as a medical concern. The diagnosis of medical stress is for a qualified doctor or trained therapist. Acute stress is different for all patients. One person’s acute stress is another’s relaxation. A simple spider might set off one person, where a spider can have no effect or even a pleasurable effect on another. Stress is an individual INTERNAL response to an EXTERNAL situation. Subclinical stressors exist every day. These can be accumulative and combine to produce an Acute Stress medical situation. A list of major stressor that can accumulate and produce a medical situation includes Christmas. The stress of Christmas might be the straw that breaks the healthy camel’s back and produces a medical situation. At any rate stress reduction might be a preventative to stopping the risk of hurting the camel’s back and producing a medical health risk.

There can be no Objective definition of Stress. It is always an individual Subjective internal reaction to External Situations. People react differently to situations. Some are more sensitive to minor subclinical stress than others. Stress can be accumulative. And stress must be assayed individually.

There once was a farmer looking for a good worker, a case of occupational placement under the Bureau of Labor Statistics NET 45-2011.00. A big strong young man seeking employment used the Occupational Outlook Handbook (OOH) andapplied to the farmer. The farmer wanting to challenge his occupational level of abilities first assigned him the excessive task of plowing an acre of land with a plow and no horse, being careful to not disobey animal safety regulations code 23-4500. The young man finished in two hours. This was validated by the OSHA Occupational Safety and Health Administration, compliance directive CPL 02-00-135. Next to further assay his occupational range of services code 311100. The farmer assigned the task of loading one hundred bales of hay into the loft of the barn. The big strong young man finished his assignment in two hours with no distress, passing code 45-2000. The farmer was now satisfied that this young man was proper for occupational assignment and he hired him, internal document 80011. To make the young man more comfortable the farmer assigned him the task of sitting under a shady tree, with a glass of lemonade, and to sort a bushel of apples, code 45-2011. Good apples place on the left bad on the right. After thirty minutes the young man was sweating and over stressed and came rushing to the farmer with a protest and a request to quit employment. The young man registered the complaint “There is too much job stress,These decisions are killing me, I Quit.”

This joke points out how regulatory picayune rules and regulations have been imposed to access in our society. Over use of imposed rules and regulations have made us lose some of our honest humanity. Medicine has been over regulated and a sea of paperwork and an ocean of regulations have made medicine impersonal and expensive. Stress is an individual concern for the personal touch of the therapist client relationship. It is paramount to medicine to maintain a personal human touch and to realize that stress reduction is a key and very important part of medicine.

The diagnosis of medical stress is for a qualified doctor or trained therapist to perform on an individual basis. The diagnosis of medical stress is NOT the job or responsibility of regulatory officials, review boards, or governmental agencies. Regulatory officers and agents intrusion into the diagnostic process is both irregular and inappropriate. Stress is an individual INTERNAL response to an EXTERNAL situation, and thus must be done on a case by case basis. Since stress reduction benefits all any stress reduction therapy such as biofeedback can have universal benefits for all patients.

The following article from Dr. Janos Selye will define this further:

The best way for us to review the SCIO policy on stress reduction is to introduce the philosophical father of the device Canadian doctor Hans Selye. A current updated literature review follows as well as our own sponsored independent research.

Hans Hugo Bruno Selye, CC (Hungarian: Selye János) (January 26, 1907 — October 16, 1982) was a Canadian endocrinologist of Austro-Hungarian origin and Hungarian ethnicity. Selye did much important factual work on the hypothetical non-specific response of the organism to stressors. While he did not recognize all of the many aspects of glucocorticoids, Selye was aware of this response on their role. Some commentators considered him the first to demonstrate the existence of biological stress.
Hans Selye was born in Vienna in 1907, of Hungarian descent, but did most of his work in Canada. As early as his second year of medical school (1926), he began developing his now-famous theory of the influence of stress on people’s ability to cope with and adapt to the pressures of injury and disease. He discovered that patients with a variety of ailments manifested many similar symptoms, which he ultimately attributed to their bodies’ efforts to respond to the stresses of being ill. He called this collection of symptoms—this separate stress disease—stress syndrome, or the general adaptation syndrome (GAS).

He spent a lifetime in continuing research on GAS and wrote some 30 books and more than 1,500 articles on stress and related problems, including Stress without Distress (1974) and The Stress of Life (1956). So impressive have his findings and theories been that some authorities refer to him as „the Einstein of medicine.” His medical genius has gone unrewarded for his work did not depend on any synthetic drug solution in an overly reductionistic style of modern medicine. He has shown that at first the symptoms of disease are alarm reactions to stressors. If the stressor continues the person’s body adapts to the alarm reaction and the symptom goes away. The stressor continues to develop disease but the alarm reaction (symptom) goes away. Thus as Selye has said “being symptom free is not an indicator of health, and a medicine based on symptoms is irregular “.

A physician and endocrinologist with many honorary degrees for his pioneering contributions to science, Selye also served as a professor and director of the Institute of Experimental Medicine and Surgery at the University of Montreal. More than anyone else, Selye has demonstrated the role of emotional and biological stressor responses in causing or combating much of the wear and tear experienced by human beings throughout their lives. He died in 1982 in Montreal, where he had spent 50 years studying the causes and consequences of non-specific stress as a universal causative agent in disease. His theory of how accumulated stressors could weaken the body and then the weak genetic link of the human health chain would be the first to snap. Thus any disease is complicated by stressors, and reducing stressors can help to improve any disease. Stressors being of emotional, toxic, deficiency, physical traumatic, infectious, allergic, job, family or other stress. All being accumulative in weakening the disease resisting force of the body.

The Nature of Stress
by Hans Selye

International Institute of Stress
University of Montreal
Montreal, Quebec, Canada

The Nature of Stress was submitted to Dr. Nelson and his other colleagues shortly before Selye’s death. Dr. Nelson knew him well having been worked with Selye and having shared his lecture platform on several occasions.

This treatise is presented as prepared by Hans Selye as if he is still living, which indeed he is through his monumental works, for Dr. Stress, or the Einstein of modern medicine as he was occasionally entitled, will live forever since so many believe that Hans Selye is the foremost medical researcher of the 20th century.

About the Author: Dr. Hans Selye is without question one of the great pioneers of medicine. His famous and revolutionary concept of stress opened countless avenues of treatment through the discovery that hormones participate in the development of many degenerative diseases, including coronary thrombosis, brain hemorrhage, hardening of the arteries, high blood pressure and kidney failure, arthritis, peptic ulcers and even cancer. At present, most of his research is concerned with formulating a code of behavior based on the laws governing the body’s stress resistance in dealing with personal, interpersonal, toxic, nutritional, traumatic and group problems.

Dr. Selye has served since 1945 as professor and Director of the Institute of Experimental Medicine and Surgery at the University of Montreal. Now he is President of the International Institute of Stress, founded by him in 1976 at the University of Montreal.

Born in Vienna in 1907, he studied in Prague, Paris, and Rome. He received his medical degree and his Ph.D. (chemistry)
from the German University in Prague, and his D.Sc. at McGill University in Montreal. He is the author of 38 volumes and more than 1600 technical articles. In addition to his doctorates he holds 20 honorary degrees from universities around the world. He is a Fellow of the Royal Society of Canada and an Honorary Fellow of 68 other scientific societies. A recipient of numerous honorary citizenships, he counts among his medals the Starr Medal (highest distinction of the Canadian Medical Association); the Prix de l’OeuvreScientifique (highest award of the Canadian Association of French-speaking Physicians); the Killam Scholarship (highest award of the Canada Council); the International Kittay Award (top prize in psychiatry); the American Academy of Achievement’s Golden Plate Award,- and the 1977 Canadian Authors Association Literary Award for nonfiction. He has, in addition, been made a Companion of the Order of Canada (the highest decoration awarded by his country).

When I wrote the first paper on the stress syndrome in 1936, I tried to demonstrate that stress is not a vague concept, somehow related to the decline in the influence of traditional codes of behavior, dissatisfaction with the world, or the rising cost of living, but rather that it is clearly a definable biological and medical phenomenon whose mechanisms can be objectively identified and with which we can cope much better once we know how to handle it.

Since then, a great deal of progress has been made in identifying the mechanisms of stress-induced bodily responses. And during recent years, considerable knowledge has been acquired about comprehending and controlling stress through scientific techniques. The results are of immense practical value for further improving the understanding of stress mechanisms by scientists, and for the treatment of certain stress-induced derangements by competent physicians.

Yet today, though everyone talks about stress, only a few people know exactly what it is. It is hard to read a newspaper or watch a television program without hearing about stress, and literally hundreds of people now lecture and write about it. They are ever ready to give advice, usually based on the teachings of an Eastern guru or Western “stressologist” - advice that works well provided that one has absolute faith in the master’s divine infallibility. Far be it from me to suggest that these people have nothing to offer, but in the absence of a clear concept of exactly what stress is, one is not likely to find it easy to maintain faith should difficulties crop up. Besides, in the modern world there are so many prophets around trying to convince us that a desire to adopt their faith is enough.

When confusions and arguments about stress - indeed about any concept - start to prove a barrier to communication and progress, it is always best to revert to the undisputed facts, the original observations that gave rise to the field. Accordingly, let us proceed to a discussion of the nature of stress.

**What stress is not**

The word stress has been used so loosely, and so many confusing definitions of it have been formulated, that I think it will be best to start by clearly stating what it is not. Contrary to current popular or medical opinion:

1. **Stress is not nervous tension.** Stress reactions do occur in lower animals and even in plants, which have no nervous system. The general manifestations of an alarm reaction can be induced by mechanically damaging a denervated limb. Indeed, stress can be produced under deep anesthesia in patients who are unconscious, and even in cell cultures grown outside the body.

2. **Stress is not an emergency discharge of hormones from the adrenal medulla.** An adrenaline discharge is frequently seen in acute stress affecting the whole body, but it plays no conspicuous role in generalized inflammatory diseases (arthritis, tuberculosis) although they can also produce considerable stress. Nor does an adrenaline discharge play any role in „local stress” reactions, limited to directly injured regions of the body.

3. **Stress is not that which causes a secretion by the adrenal cortex of its hormones (the corticoids).** ACTH, the adrenal-stimulating pituitary hormone, can discharge these hormones without producing any evidence of stress.

4. **Stress is not the nonspecific result of damage only.** Normal and even pleasant activities - a game of tennis or
a passionate kiss - can produce considerable stress without causing conspicuous damage.

5. Stress is not the deviation from homeostasis, the steady state of the body. Any specific biologic function, e.g., the perception of sound or light, the contraction of a muscle, eventually causes marked deviations from the normal resting state in the active organs. This is undoubtedly associated with some local demand for increased vital activity, but it can cause only „local stress” and even this does not necessarily parallel the intensity of the specific activity.

6. Stress is not that which causes an alarm reaction. The stressor does that, not stress itself.

7. Stress is not identical with the alarm reaction or with the G.A.S. as a whole. These are characterized by certain measurable organ changes which are caused by stress.

8. Stress itself is not a nonspecific reaction. The pattern of the stress reaction is very specific: it affects certain organs (e.g., the adrenal, the thymus, the gastrointestinal tract) in a highly selective manner.

9. Stress is not a reaction to a specific thing. The stress response can be produced by virtually any agent.

10. Stress is not necessarily undesirable. It all depends on how you take it. The stress of failure, humiliation, or infection is detrimental; but that of exhilarating, creative, successful work is beneficial. The stress reaction, like energy consumption, may have good or bad effects.

11. Stress cannot and should not be avoided. Everybody is always under some degree of stress. Even while quietly asleep our heart must continue to beat, our lungs to breathe, and even our brain works in the form of dreams. Stress can be avoided only by dying. The statement „He is under stress” is just as meaningless as „He is running a temperature.” What we actually refer to by means of such phrases is an excess of stress or of body temperature.

If we consider these points, we may easily be led to conclude that stress cannot be defined, and that perhaps the concept itself is just not sufficiently clear to serve as the object of scientific study.

Nevertheless, stress has a very clear, tangible form. Countless people have actually suffered or benefited from it. Stress is very real and concrete indeed, and is manifested in precisely measurable changes within the body. So before we proceed to a formal definition of the nature of stress, we will describe these manifestations.

What stress is

Mechanism. The workings of stress are extremely complex (see Figure). Apart from specific stimuli, which need not be discussed here, the first effect of any, agent or demand made upon the body - be it running up a flight of stairs, dealing with a viral infection, or performing a dance - is to produce a nonspecific stimulus (the agent’s “stressor effect.”) This may be a nervous impulse, a chemical substance or lack of an indispensable metabolic factor; it is referred to simply as the “first mediator,” because we know nothing about its nature. We are not even certain that it has to be an excess or deficiency of any particular substance; it is possible that various derangements of homeostasis can activate the stress mechanism.

Although we have still to identify the first mediator(s), we do know that eventually stress acts upon the hypothalamus and particularly upon the median eminence (ME). This action appears largely to be mediated through or modified by nervous stimuli coming from the cerebral cortex, the reticular formation and the limbic system (especially the hippocampus and amygdala). The incoming nervous stimuli reach certain neuroendocrine cells, most of which are located in the ME. These act as “transducers,” transforming nervous signals into a humoral messenger, the corticotrophin hormone releasing factor (CRF), which can be demonstrated histochemically in the ME region and can also be extracted from it. Oddly enough, the posterior pituitary contains the highest concentration of CRF, and it has been isolated from this source in pure form, thus permitting the determination of its chemical formula as a polypeptide which subsequently was synthesized. Yet we have no conclusive proof that the CRF-active material extracted from the hypothalamus is identical with that obtained from the posterior lobe since only the structure of the latter has been definitely ascen-
tained. Although vasopressin (antidiuritic hormone) possesses considerable CRF activity it is not identical with CRF; this has been shown by the welldocumented differences in their chemical structure and physiologic activity.

CRF reaches the anterior lobe through the hypothalamo-hypophyseal portal system that originates in the ME region within a network of capillaries into which CRF is discharged by the local neuroendocrine cells. It is then carried down through the larger veins of the pituitary stalk to a second capillary plexus in the pituitary.

The hypothalamus does not stimulate the adrenocorticotropic hormone (ACTH) secretion of the anterior lobe through nervous pathways descending in the pituitary stalk but rather through blood-borne substances carried by way of the portal veins. That is why transection of the stalk inhibits the ACTH secretion only before vascular connections between the hypothalamus and the gland are reestablished; if regeneration of these vessels is prevented by interposing a plate between the cut ends of the stalk, this pathway is permanently blocked.

Both in vivo and in vitro experiments have proven that CRF elicits a discharge of ATCH from the adenohypophysis into the general circulation. Upon reaching the adrenal cortex, it causes secretion of corticoids, mainly glucocorticoids such as cartisol or corticosterone. These induce glyconeogenesis, thereby supplying a readily-available source of energy for the adaptive reactions necessary to meet the demands faced by the body. In addition, they facilitate various other enzymatically regulated adaptive metabolic responses and suppress immune reactions as well as inflammation, assisting the body to coexist with potential pathogens (syntoxic reactions). Furthermore, the glucocorticoids are responsible for the thymic lymphatic involution, eosinopenia and lymphopenia characteristic of acute stress. Curiously, glucocorticoids are needed for the acquisition of adaptation primarily during the alarm reaction, but not so much to maintain the adjustment during the stage of resistance. ACTH plays a comparatively minor role in the secretion of mineralocorticoids, such as aldosterone, which is regulated mainly by the renin-hypertension system and the blood electrolytes, whose homeostasis is in turn influenced by them.

This chain of events is cybernetically controlled by several biofeedback mechanisms. Whether an excess of CRF can inhibit its own endogenous secretion is still doubtful because its lifespan in the circulating blood is very short. On the other hand, there is definite proof of an ACTH feedback (short-loop feedback) by a surplus of the hormone, which returns to the hypothalamo-pituitary system and inhibits further ACTH production. We have even more evidence to substantiate the existence of a corticoid feedback mechanism (long-loop feedback) in that a high blood corticoid level similarly inhibits ACTH secretion. It is still not quite clear to what extent these feedbacks act upon the neuroendocrine cells of the hypothalamus, the adenohypophysis or both. (Hence, in the Figure the corresponding arrowheads merely point towards the hypothalamo-hypophyseal region in general, without specifying exactly where their target areas are situated.)

Another major pathway involved in the stress mechanism is carried through the catecholamines liberated under the influence of an acetylcholine discharge, at autonomic nerve endings and in the adrenal medulla. The chromaffin cells of the latter secrete mainly epinephrine, which is of considerable value in that it stimulates mechanisms of general utility to meet various demands for adaptation. Thus it provides readily available sources of energy by forming glucose from glycogen depots and free fatty acids from the triglyceride stores of adipose tissue; it also quickens the pulse, raises the blood pressure to improve circulation into the musculature, and stimulates the CNS. In addition, epinephrine accelerates blood coagulation and thereby protects against excessive hemorrhage should wounds be sustained in conflicts. All of this is helpful in meeting the demands, whether they call for fight or flight.

At this point it will be helpful to discuss two apparent objections to accepting the concept of a single stereotyped response to stress:

1. Qualitatively different agents of equal toxicity or stressor potency do not necessarily elicit exactly the same reactions in different people.

2. Even the same degree of stress, induced by the same agent, may produce different effects and even lesions in different individuals.
3. The effects specific to any given agent usually modify the effects and manifestations of the general stress syndrome. (thus, it took many years to recognize and prove the existence of the latter.)

4. The fact that the state of stress, even if due to the same agent, can cause different effects in different individuals, has been traced to „conditioning factors“ that can selectively enhance or inhibit one or the other stress effect. This conditioning may be endogenous (genetic predisposition, age or sex) or exogenous (treatment with certain hormones, drugs, or dietary factors.) (See Figure.) Under the influence of such conditioning factors, a normally well-tolerated degree of stress can even become pathogenic, selectively affecting those parts of the body that are particularly sensitized both by those conditioning factors and by the specific effects of the eliciting agent, just as physical tensions of equal strength in different chains will break the particular link that is the weakest as a result of internal or external factors.

The foregoing processes are the principal ones involved in the stress reaction, but by no means the only ones. As well, the level of STH, the growth hormone, may rise, and changes in the output of thyroid hormones of the ovary or testis may take place.

Stressors. The agents or demands that evoke this coordinated response which I have designated 11 stress” are referred to, quite naturally, as stressors; and of course something is a stressor to the same degree that it calls forth the syndrome.

When the stressor in question is some organism or substance foreign to the body, the curative process resulting from the stress reaction can take either of two forms, according to whether the pathogen causes trouble directly or indirectly. Direct pathogens cause disease irrespective of our body’s reaction, whereas indirect pathogens produce damage only through the exaggerated and purposeless defensive responses they provoke. If a patient accidentally exposes his hand to a strong acid, alkali, or boiling water, damage will occur irrespective of his reactions. Because all these are direct pathogens; they would cause damage even to the body of a dead man who obviously could not put up any vital defense reactions. On the other hand, most common inflammatory irritants, including allergens, are essentially indirect pathogens, which do not themselves cause disease, but are damaging only by stimulating an inopportune and harmful fight against what is innocuous.

During evolution, immunologic reactions which lead to destruction of microbes, grafts, and other foreign tissues undoubtedly developed as useful defensive mechanisms against potentially dangerous foreign materials. However, when - as in the case of many allergens, heart transplants, etc. - the attack against the “foreign” agent is unnecessary or even harmful, man can improve upon the wisdom of Nature by suppressing this hostility. Nevertheless, when the aggressor is dangerous, the defensive reaction should not be suppressed but, if possible, increased above the normal level, which can be done, for example, by catatoxic substances that carry the chemical message to the tissues to destroy the invaders even more actively than would normally be the case.

However, stressors are not exclusively physical in nature. Emotions, e.g., love, hate, joy, anger, challenge and fear, also call forth the changes characteristic of the stress syndrome.

Stress and disease. Stress is an individual INTERNAL response to an EXTERNAL situation. In general, the hormonal responses outlined above aid adaptation to environmental change or stimuli; but they are sometimes the cause of disease, especially if the state of stress is prolonged or intense. In this latter case, the body goes through the three stages of what I call the “general adaptation syndrome” (G.A.S.). The first is the alarm reaction, characterized by the changes above described. Of course, if the stressor (stress-producing agent) is so severe that continued exposure is incompatible with life, the organism will die within a few hours during this stage; otherwise, a stage of adaptation of resistance will ensue, since no organism can be maintained continuously in a state of alarm. The adaptive stage is characterized by the vanishing or diminishing of the initial symptoms, since the body has achieved optimal adaptation. After still more prolonged exposure to the stressor, however, this acquired adaptation is lost and a third stage of exhaustion is entered into, which, unless the organism receives emergency aid from some outside source, leads to death. Apparently, the adaptability of an organism is finite.
Also of interest is the routine picture of endocrine gland disturbance that Selye (The Stress of Life, New York, McGraw-Hill, Inc., 1956) so ably depicted in the General Adaptation Syndrome brought on by any Stress to the body."

**Definition.** Let us see now whether the following definition will fit all our facts:

*Stress is the state manifested by a specific syndrome which consists of all the nonspecifically-induced changes within a biologic system. Thus, stress has its own characteristic form and composition, but no particular cause. The elements of its form are the visible changes due to stress, which are addictive indicators expressing the sum of all the different adjustments that are going on in the body at any time.*

The above is essentially an “operational definition”; it tells what must be done to produce and recognize stress. A state can be recognized only by its manifestations; you have to observe a great many living beings exposed to a variety of agents before you can see the shape of stress as such. Those changes which are induced by only one or the other agent must first be rejected; if you then take what is left - that which is induced by many agents - you have uncovered stress itself.

For simplicity’s sake we have attempted to state the essence of this concept in the following, less formal terms:

Stress is the nonspecific response of the body to any demand, whether is is caused by, or results in, pleasant or unpleasant conditions. Stress as such, like temperature as such, is all-inclusive, embodying both the positive and the negative aspects of these concepts.

Within the general concept of stress, however, we must differentiate between distress (from the Latin dis = bad, as in dissonance, disagreement), and eustress (from the Greek eu = good, as in euphonia, euphoria). During both eustress and distress the body undergoes virtually the same nonspecific responses to the various positive or negative stimuli acting upon it. However, the fact that eustress causes much less damage than distress graphically demonstrates that it is “how you take it” that determines, ultimately, whether you can adapt successfully to change.

**The general adaptation syndrome**

**Definition.** While stress is reflected by the sum of the nonspecific changes as they develop throughout time during continued exposure to a stressor, the G.A.S. encompasses all nonspecific changes as they occur during continued exposure to a stressor. One is a snapshot, the other a motion picture of the response to demands.

Thus, the G.A.S. may be defined as the manifestation of stress in the whole body, as they develop in time. As we have seen, a fully-developed G.A.S. consists of three stages: the alarm reaction, the stage of resistance, and the stage of exhaustion. Yet it is not necessary for all three stages to develop before we can speak of G.A.S. Only the most severe stress leads rapidly to the stage of exhaustion and death. Most of the physical or mental exertions, infections, and other stressors, which act upon us during a limited period, produce changes corresponding only to the first and second stages: at first they may upset and alarm us, but then we adapt to them.

Normally, in the course of our lives, we go through these first two stages many, many times. Otherwise we could never become adapted to all the activities and demands which are man’s lot. Even the stage of exhaustion does not always need to be irreversible and complete, as long as it affects only parts of the body. For instance, running produces a stress situation, mainly in our muscles and cardiovascular system. To cope with this, we first have to limber up and get these organs ready for the task at hand; then for a while we will be at the height of efficiency in running, but eventually exhaustion will set in. This could be compared with an alarm reaction, a stage of resistance, and a stage of exhaustion, all limited primarily to the muscular and cardiovascular system. But such exhaustion is reversible; after a good rest we will be back to normal.

Most human activities go through three stages analogous to those of the G.A.S.: we first have to get into the swing of things, then we get pretty good at them, but finally we tire and lose our acquired efficiency. This triphasic evolution of adaptation is quite characteristic also of all bodily activities, including those that only the physician can fully appraise; for instance, of inflammation. If some virulent microbes get under the skin, they first cause what we call acute
inflammation (reddening, swelling, pain); then follows chronic inflammation (ripening of a boil or abscess); and finally an exhaustion of tissue resistance takes place, which permits the inflamed, purulent fluid to be evacuated (breaking through of an abscess).

The diseases of adaptation. Many maladies are due not so much to what happens to us as to our inability to adapt, and they have therefore been called “diseases of adaptation.” The most common of such diseases are peptic ulcers in the stomach and upper intestine, high blood pressure, heart accidents, and nervous disturbances. Of course, any event makes demands upon us and, hence, causes some stress, but it is only people who cannot cope, either because of innate defects or lack of knowledge, who develop stress diseases.

Yet this is a relative concept. No malady is just a disease of adaptation. Nor are there any disease producers which can be so perfectly handled by the organism that maladaptation plays no part in their effects upon the body. Such agents would not produce disease. This haziness in its delimitation does not interfere with the practical utility of our concept. We must put up with the same lack of precision whenever we have to classify any other kind of disease. There is no pure heart disease, in which all other organs remain perfectly undisturbed, nor can we ever speak of a pure kidney disease or a pure nervous disease in this sense.

The concept of adaptation energy. The selective exhaustion of muscles, eyes, or inflamed tissue all represent final stages in local adaptation syndromes (L.A.S.) only. Several of these may develop simultaneously in various parts of the body; in proportion to their intensity and extent, they can activate the G.A.S. mechanism. It is when the whole organism is exhausted - through senility at the end of a normal life-span, or through the accelerated aging caused by stress - that we enter into the (fatal) stage of exhaustion of the G.A.S.

Apparently, we have hidden reserves of adaptability, or adaptation energy, in ourselves throughout the body. As soon as local stress consumes the most readily accessible local reserves, local exhaustion sets in and activity in the strained part must stop. This is an important protective mechanism because, during the period of rest thus enforced, more adaptation energy can be made available, either from less readily accessible local stores or from reserves in other parts of the body. Only when all of our adaptability is used up will irreversible, general exhaustion and death follow.

Adaptation energy and a natural code of behavior

There seem to be close interrelations between the G.A.S. and aging. We have already mentioned that several local adaptation syndromes may develop consecutively or even simultaneously in the same individual. People can get used to a number of things (cold, heavy muscular work, worries), which at first had a very alarming effect; yet, upon prolonged exposure, sooner or later all resistance breaks down and exhaustion sets in. The term “adaptation energy” has been coined for that which is consumed during continued adaptive work, to indicate that it is something different from the caloric energy we receive from food; but this is only a name, and even now we still have no precise concept of what this energy might be. Further research along these lines would seem to hold great promise, since we appear to touch upon the fundamentals of fatigue and aging.

Seemingly, each individual inherits a certain amount of adaptation energy, the magnitude of which is determined by his genetic background, his parents. He can draw upon this capital thriftily for a long but monotonously uneventful existence, or he can spend it lavishly in the course of a stressful, intense, but perhaps more colorful and exciting life. In any case, there is just so much of it, and he must budget accordingly.

How can we, as individuals, best manage our limited store of this energy? Surely scientists have found enough evidence to justify trying to develop the fundamentals of a code of behavior based only on the laws of Nature, though we may need much more scientific work to learn how to apply them in our daily life and to make them easily understandable.

In the light of what my own laboratory and clinical study of somatic diseases has taught me concerning stress, I have tried to arrive at a code of ethics based not on the strictures and traditions of society, inspiration, or blind faith in the infallibility of a particular prophet, religious leader or political doctrine, but on the scientifically verifiable laws that govern the body’s reactions in maintaining homeostasis and living in satisfying equilibrium with its environment. By
means of such a code, we can adjust our personal reactions to enjoy fully the eustress of success and accomplishment without suffering the distress commonly generated by frustrating friction and purposeless, aggressive behavior against our surroundings.

It is a biologic fact that man - like the lower animals - must fight and work for some goal that he considers worthwhile. We must use our innate capacities to enjoy the eustress of fulfillment. Only through effort, often aggressive, egoistic effort, can we maintain our fitness and assure our homeostatic equilibrium with both the social and the inanimate world. To achieve this state, our activities must earn lasting results; the fruits of work must be cumulative and must provide a capital gain to meet future needs. To succeed, we have to accept the scientifically established fact that man has an inescapable natural urge to work egoistically for things that can be stored to strengthen his homeostasis in the unpredictable situations with which life may confront him.

We should not combat or be ashamed of these instincts. We can do nothing about having been built to work, and it is primarily for our own good. Organs that are not used (muscles, bones, even the brain) undergo inactivity atrophy, and every living being looks out first of all for itself. Neither should we feel guilty because we work for treasures that can be stored to ensure our future homeostasis. Hoarding is a vitally important biologic instinct that we share with animals such as ants, bees, squirrels and beavers. In man, the urge first manifests itself when children start to gather match boxes, shells or stickers; it continues when adults collect stamps or coins. Such a universal drive cannot be an artificial, indoctrinated tradition.

On the other hand, there is no example in Nature of a creature guided exclusively by altruism and the desire to protect others. In fact, a code of universal altruism would be highly immoral, since it would expect others to look out for us more than themselves. Of course, “Love thy neighbor as thyself” is a command full of wisdom; but, as originally expressed, it is incompatible with biologic laws; no one needs to develop an inferiority complex if he cannot love all his fellow men on command.

What are the ingredients of a code of ethics that accepts egoism and working to hoard personal capital as morally correct? After four decades of clinical and laboratory research, I would summarize the most important principles briefly as follows:

1. Find you own stress level - the speed at which you can run toward your own goal. Make sure that both the stress level and the goal are really your own, an not imposed upon you by society, for only you yourself can know what you want and how fast you can accomplish it. There is no point in forcing a turtle to run like a racehorse or in preventing a racehorse from running faster than a turtle because of some “moral obligation.” The same is true of people.

2. Be an altruistic egoist. Do not try to supress the natural instinct of all living beings to look after themselves first. Yet the wish to be of some use, to do some good to others, is also natural. We are social beings, and everybody wants somehow to earn respect and gratitude. You must be useful to others. This gives you the greatest degree of safety, because no one wishes to destroy a person who is useful.

3. Earn thy neighbor’s love. This is a contemporary modification of the maxim „Love thy neighbor as thyself.” It recognizes that not all neighbors are lovable and that it is impossible to love on command.

Perhaps two short lines can encapsulate what I have discovered from all my thought and research:

\[
\text{Fight for your highest attainable aim,} \\
\text{But do not put up resistance in vain.}
\]

So far as possible, I myself have followed this philosophy, and it has made my life a happy one. Frankly, in looking back, I realize that I have not always succeeded to perfection, but this has been due to my own shortcomings, not those of the philosophy. As I have often said. The builder of the best racing car is not necessarily its best driver.

As to a driver, I turn my life’s work over to my successors like Dr. Nelson who I believe can drive this car and revolu-
Notes

1. Undoubtedly, in man, with his highly developed central nervous system (CNS), emotional arousal is one of the most frequent activators. Yet it cannot be regarded as the only factor, since typical stress reactions can occur in patients exposed to muscle fatigue, trauma, hemorrhage, etc. while under deep anesthesia. Indeed anesthetics themselves are commonly used in experimental medicine to produce stress, and 11 stress of anesthesia” is a serious problem in clinical surgery.

Bibliography

The work of the Canadian genius medical doctor Hans Selye, has shown the world the pervasive and comprehensive effects of stress on the body. Stress and stressors weaken the body's immune system and generally weaken the whole defense system, thus the genetic or systemic weak link of the body will give out first from continued stress. Reducing stressors helps all diseases. Our system uses a health questionnaire to assay behavior or lifestyle stressors and to educate the client to reduce the stress burden.

Towards a new Safe and Effective truly Modern Medicine

Health is Ease of Flow, Stressors block Flow, Stress is more than Just personal stress.
Stress Reduction is the key to Medicine.

Major Stressors or Causes of Disease include:

LACK OF AWARENESS OR LACK OF EDUCATION
STRESS
HEREDITY
MENTAL FACTORS
(Greed, anger, delusion arrogance ETC)
ALLERGY
BAD POSTURE

TOXICITY
TRAUMA INJURY
PATHOGENS (microorganisms, bacteria, fungus, virus, prions, worms, etc.)
PERVERSE ENERGY (heat, cold, wind, dryness, radiation, magnetic, etc.)
DEICIENCY OR EXCESS OF NUTRIENTS

Nelson Method of Medicine

1. Reduce the Causes of Disease, Change Behavior, get patients to Care, get the nail out of the tire
2. Repair the organs weakened by the Causes. Restore Health. Fix the tire
3. Unblock the Blockages to energy, nutrition, Oxygen, waste, Panaza, acupuncture, nervous FLOW
4. Treat the symptoms with natural means before resorting to Synthetic. Use foods, exercise, herbs, homoeopathics any and all natural means before resorting to Synthetics
5. Balance the metabolic typing or Constitutional Imbalances. Treat the patient as an Individual Whole

Selye Pathway of Disease

Health then enter stressor (toxin etc)-enters
1. ALARM Stage
   symptoms are the alarm, not the enemy, symptoms at first are related to the stressor, later the dysfunctions
   if stressor continues then
2. ADAPTATION Stage
   symptoms go away as we adapt, the disease penetrates deeper. You can have no symptoms and be very very sick.
   Being symptom free is not an indicator of healing
   if stressor continues then
3. FIGHVEL Stage
   the stressors burden the weakest organs
   if stressor continues then
4. FUNCTIONAL
   the stressors effect the weakest organ functions
   if stressor continues then
5. DISORDERS
   then the weak organs start to swell or shrink
   if stressor continues then
6. DEATH
   cellular, organs, organ system, organism death

Since the body's weakest link is prone to disease from the stressors, any disease will improve with reduction of the stressors. If there is good nutrition and no excess or defciency of nutrients, the body's repair system improves. With stress reduction the Para-Sympathetic system becomes free to boost digestion and immumity as well as cellular repair. Some stressors can have more specific toxin diseases, such as cigarettes trigger the lungs primarily. But with the lack of systemic oxygen, any other weak link in the body from genetics or from life will be involved. Thus stress reduction is a universal remedy for all diseases. Reduction of disease via immumity and exercise corrects many medical diagnoses with one universal remedy, a non-complex, non-productive, expensive, unsafe, risky and most often ineffective. Add to this the risk of side effects from synthetic drugs and we see the poor history of medicine. Nelson and Selye have planted out a safe, inexpensive and effective new era: Modern Medicine.
STRESS

HEREDITY

MENTAL FACTORS (Greed, anger, delusion arrogance ETC)

ALLERGY

BAD POSTURE

TOXICITY

TRAUMA INJURY

PATHOGENS (MICRO-ORGANISMS, Bacteria, fungus, virus, prions, worms ETC)

PERVERSE ENERGY (Heat, cold, wind, dryness, radiation, magnetic ETC)

DEFICIENCY OR EXCESS OF NUTRIENTS

When the stressor or stressors weaken the defenses of the body, the weakest link of the body (from nature or nurture) is most prone to distress and thus disease.

HEALTH THEN ENTER STRESSOR (TOXIN ETC)-enters

1. ALARM Stage- symptoms are the alarm, not the enemy, symptoms at first are related to the Stressor, later the dysfunction

if stressor continues then

2. ADAPTATION Stage: symptoms go away as we adapt, the distress + disease penetrates deeper.
   You can have no symptoms and be very very sick.
   Being symptom free is not an indicator of Health

if stressor continues then

3. EXHAUSTION Stage: the stressors burden the weakest organs

if stressor continues then

a. FUNCTIONAL first the stressors effect the weakest organ function

if stressor continues then

b. ORGANIC then the weak organs start to swell or shrink

if stressor continues then

4. DEATH cellular, organ, organ system, organism death

1. Reduce the Causes of Disease, Change Behavior, get patients to Care, get the nail out of the tire

2. Repair the organs weakened by the Causes. Restore Health. Fix the Tire

3. Unblock the Blockages to energy, nutrition, Oxygen, waste, Parana, acupuncture, nervaFLOW
4. Treat the symptoms with natural means before resorting to Synthetic. Use foods, exercise, herbals, homeopaths any and all natural means before resulting to Synthetics

5. Balance the metabolic typing or Constitutional Imbalances. Treat the patient as an Individual Whole

Since the body’s weakest link is prone to disease from the stressors, any disease will improve with reduction of the stressors. If there is good nutrition and no excess or deficiency of nutrients, the body’s repair system improves. With stress reduction the Para-Sympathetic system becomes free to boast digestion and immunity as well as cellular repair. Some stressors can have more specific target diseases, such as cigarettes target the lungs primarily. But with the lack of systemic oxygen, any other weak link in the body from genetics or from life will be involved. Thus stress reduction is a universal therapy for all diseases. Reductionism of diseases via inaccurate and expensive current medical diagnostic means, are archaic, inaccurate, overly complex, non-productive, expensive, unsafe, risky and most often ineffective. Add to this the risk of side effects from SINthetic drugs and we see the poor history of medicine. Nelson and Selye have plotted out a safe, inexpensive and effective new more modern medicine.

SUPPRESSION AND OBSTRUCTION TO CURE

SOC Index:

The SCIO interview opens with a behavioral medicine interview. This is called the SOC Index. Named after the work of Samuel Hahneman the father of homeopathy, he said that the body heals itself with its innate knowledge. But the patient can suppress or obstruct the healing process with some behavior. Hahneman said that the worst way to interfere with the healing natural process was allopathy or synthetic drugs. These upset the natural healing process by unnatural intervention and regulation disturbance. Other ways to Suppress or Obstruct the Cure are smoking, mercury amalgams, stress, lack of water, exercise and many others. This behavioral survey then gives an index of SOC.

The scores relate to the risk of Suppression and Obstruction to the natural Cure. The higher the scores the more the Suppression and or Obstruction. The scores of 100 or lower are ideal. The SOC index questions are: mostly based on a scanine (1-10) answer. Some answers can be more.

These questions include:
1. Number of organs removed:
2. Number of Synthetic drugs taken currently:
3. Number of cigarettes you smoke a day
4. Number of metal or amalgam fillings in the teeth during the last year:
5. Number of street drugs used per month:
6. Number of known allergies:
7. Number of unresolved mental factors:
8. Are you responsible for you body and the diseases you have:
9. Amount of fat in diet as a percent:
10. Personal stress 0-10 10 being max. numbers can be larger than 10.
11. Number of sugar servings per day:
12. Number of exercise sessions 20 min or more per week:
13. Number of alcoholic drinks per day average:
14. Number of cups of coffee or any caffeine product:
15. Number of extreme toxic exposures last year:
16. Number of major injuries in past:
17. Number of major infections in past:
18. Number of glasses of water or natural fruit juice per day:
19. Number of pounds overweight:
20. Interpersonal stress 0-10 10 being max. Numbers can be larger than 10.
21. Job-school stress 0-10 10 being max. Numbers can be larger than 10.
22. Money stress 0-10 10 being max. Numbers can be larger than 10.
23. Sickness stress 0-10 10 being max. Numbers can be larger than 10.
24. Family stress 0-10 10 being max. Numbers can be larger than 10.
25. Desire stress 0-10 10 being max. Numbers can be larger than 10.
26. Bowel detox stress 0-10 10 being max. Numbers can be larger than 10.
27. Sweat detox stress 0-10 10 being max. Numbers can be larger than 10.
28. Urine detox stress 0-10 10 being max. Numbers can be larger than 10.
29. Mucous detox stress 0-10 10 being max. Numbers can be larger than 10.
30. Skin detox stress 0-10 10 being max. Numbers can be larger than 10.
31. Sleep stress 0-10 10 being max. Numbers can be larger than 10.
32. Number of Root canals:

Each of these questions relates a behavioral burden on the body that can create a suppression or obstruction to the curative process. Scores below 50 are very good and show little risk of suppression or obstruction. Scores above 50 and below 100 are good and show some chance of suppression or obstruction to cure. Numbers above 100 are of risk.

Social Stress Inventory Form

DETERMINING THE SOURCES AND EXTENT OF STRESS IN YOUR LIFE

Stress that is not handled properly can affect you in many ways. It can impair your ability to function mentally at home and at work. You can experience a variety of physical symptoms that can range from headaches to gastrointestinal upsets. Everyone experiences the negative effects of stress at various points in their lives. The danger lies in chronic stress overload. When your body is constantly in the fight or flight mode, you are bound to blow a fuse at your body’s weakest point. For some people the end result is a serious mental or physical illness.

This survey is designed to help you determine:

1) Your general level of stress.
2) Your level of stress at work.
3) Your physical symptoms of stress.
4) Your level of stress in interpersonal situations.

Take a look at the checklists that follow to see how stressed you are.
How Stressed Are You?

Directions: Indicate how often your feelings agree with the statements below. Scoring for each item is based on the following scale:

1 = Never feel that way
2 = Seldom feel that way
3 = Sometimes feel that way
4 = Frequently feel that way
5 = Always feel that way

How Stressed Are You? (General Feelings)

1. I worry a lot.
2. I feel unhappy.
3. All kinds of worrisome thoughts run through my mind.
4. There are times when I feel like crying for no reason.
5. I don’t know what’s the matter with me. I’m so irritable.
6. I have lost my ability just to sit around and do nothing.
7. I feel like I’m living inside a pressure cooker and about to explode.
8. Lately I’m bored with my life, job, friends and even my loved ones.
9. Deep inside, I’m dissatisfied and I don’t know why.
10. I forget things.

Total Score =

How Stressed Are You? (Work Performance)

1. I have trouble concentrating on my work.
2. It takes me forever to make decisions.
3. I can’t seem to stick to a job.
4. From the time I get there until I leave, I’m plain fidgety.
5. I overreact to things at work.
6. I let minor things get to me.
7. I procrastinate.
8. I can’t seem to get organized.
9. I’m unclear about my role at work.
10. I do a lot of paper shuffling.
How Stressed Are you? (Physical Symptoms)

1. My heart races or pounds.
2. I have trouble catching my breath.
3. I get diarrhea.
4. I have headaches.
5. I have to urinate frequently.
6. I get dizzy for no reason.
7. I spend my nights awake, or it takes forever to fall asleep.
8. I’m tired.
9. My throat and/or mouth is often dry.
10. My stomach is tense.
11. I have no energy.
12. I’m chilly.
13. My neck (or shoulders, eye, chest, lower back, throat, hands) is sore, stiff or painful.
14. Lately I seem to have one bug or cold after another.
15. In the afternoon I run out of steam.
16. My posture is terrible.

How Stressed Are You? (Interpersonal Relations)

1. I startle easily when people come up on me.
2. Around people, I can’t speak correctly.
3. I can’t stand to be around a particular person (or group).
4. I can’t stand to be around people when they are emotional.
5. I can’t tell anyone how I feel.
6. I don’t feel anything.
7. I can’t laugh at myself.
8. Down deep, I’m not happy with my sex life.
9. I don’t trust anybody.
10. I need help (food or drink) to be social.

Total Score =
### SCORING

<table>
<thead>
<tr>
<th>Category</th>
<th>No. Items</th>
<th>Total Score (Add Up All Items)</th>
<th>Average Score (Divide Total Score by Number of Items)</th>
</tr>
</thead>
<tbody>
<tr>
<td>General</td>
<td>10</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Work</td>
<td>10</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Physical</td>
<td>16</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Interpersonal</td>
<td>10</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>ALL SCALES</strong></td>
<td><strong>46</strong></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

To compute overall average score, add up your total scores for each scale and divide by 46.

*5 is the highest score, 1 the lowest.*
Through a devolving web of greed, self-serving power and a departure from fundamental ethics, Western culture has, over the last hundred years, become the counterfeit synthetic culture.

Drive for profit and patent protection of synthetics makes for more and more Synthetic compounds.

Nothing is real anymore -- not the food, not the money, and certainly not the evening news. And because it's not real, it's not sustainable. That's why it's headed for collapse, which is all too real, as many people are about to find out.

Nature has succumbed to profit. Natural has become passé as all the market talk is about synthetics.

In the meantime, here are some observations about the counterfeit synthetic culture in which we all frustratingly find ourselves. It's all about corporations, governments and institutions being "in the business of" counterfeiting something -- faking something or pretending to create something of value when they really aren't. Ring a bell?

The Counterfeit Synthetic Culture

The Federal Reserve is in the business of counterfeiting money.

The mainstream media is in the business of counterfeiting news and protecting the profits of the owners of the news the Ultra-Rich.
Why stress makes colds more likely
By Medical expose' staff

Most of us know from experience that stress weakens our immune system. Colds always seem to strike when we're overworked or emotionally exhausted, as do eczema flare-ups, headaches and a myriad of other health problems.

Doctors long ago confirmed that the connection between stress and health is real, but they haven't been able to fully explain it. Now, in a new study, researchers say they've identified a specific biological process linking life stressors - such as money trouble or divorce - to an illness.

In this case it's the common cold.

Most research in this area has focused on cortisol, the so-called stress hormone released by the adrenal glands when we feel threatened or anxious. One of cortisol's jobs is to temporarily dampen the immune system, specifically the inflammatory response, in order to free up energy to deal with threats.

The fact that cortisol suppresses inflammation presents a puzzle: People who are chronically stressed tend to have higher levels of cortisol, yet the sneezing, sniffing and coughing of the average cold are actually caused by the inflammatory response to a virus, not the virus itself.

Shouldn't stress therefore prevent cold symptoms?

Health.com: How to stop a cold in its tracks

The authors of the new study have an answer: The key factor that influences a person's vulnerability to illness appears to be the immune system's sensitivity to cortisol, not his or her cortisol levels per se. And chronic stress, the study suggests, may weaken the body's responsiveness to the hormone, allowing the inflammation that causes cold symptoms to run wild.

"Stressed people's immune cells become less sensitive to cortisol," says lead author Sheldon Cohen, Ph.D., a professor of psychology at Carnegie Mellon University, in Pittsburgh. "They're unable to regulate the inflammatory response, and therefore, when they're exposed to a virus, they're more likely to develop a cold."

Cohen and his colleagues tested their theory in a pair of experiments, published this week in the Proceedings of the National Academy of Sciences. In the first, they interviewed 276 healthy men and women about the sources of psychological stress in their lives over the previous year, including unhappy work situations, long-term conflicts with
family or friends, or legal or financial woes. And then they tried to get them sick.

Health.com: Job killing you? 8 types of work-related stress

The researchers gave each study participant nasal drops containing a rhinovirus (a common cold-causing virus) and quarantined them for five days, during which 39% of the volunteers came down with a cold. Those who were stressed-out had double the risk of falling ill, even after age, body mass index and a host of other factors were taken into account.

When the researchers went back and looked at blood tests taken a week or two earlier, they found no link between blood cortisol levels and the likelihood of getting sick. However, they did find that the typical relationship between cortisol and inflammation - as one rises, the other tends to fall - seemed to be disrupted in people who were stressed-out and in those who developed colds.

In these groups, cortisol levels had no bearing on inflammation (as measured by the levels of certain white blood cells), suggesting that "stressed people were... resistant" to cortisol and "non-stressed people were not," Cohen says.

A second, smaller experiment that used a different measure of inflammation confirmed the link between cortisol resistance and higher levels of inflammation.

Health.com: 7 steps to instant calm

Although a cure for the common cold is still a long ways off, the findings do raise the possibility that there may be "ways of intervening when a person is chronically stressed, possibly pharmacologically, to influence this kind of process," Cohen says.

An intervention of that sort wouldn't only be useful during cold-and-flu season, since a wide range of health problems have been linked to stress and inflammation, including heart disease, diabetes, asthma, and autoimmune diseases such as rheumatoid arthritis and psoriasis.

The study "implies that other diseases where the control of inflammation is important would be influenced in the same way—that we could find the same sort of mechanisms operating in those cases," Cohen says.