DYSFUNCTIONAL BREATHING AND ITS EFFECTS ON THE BRAIN, CARDIOVASCULAR SYSTEM, AND IMMUNITY

GREG RITTENHOUSE, BS, BBE, RRT, FBPI

BREATH OF LIFE BREATHING RETRAINING

WWW.REDUCEBREATHING.COM

Breath of Life

DISCLAIMER

Please don't misconstrue any of my comments to be medical advice for you.

That's best obtained from your personal physician or other health professional.

I'm not practicing medicine here tonight.

DISEASE OR CONSEQUENCE? THAT IS THE QUESTION!

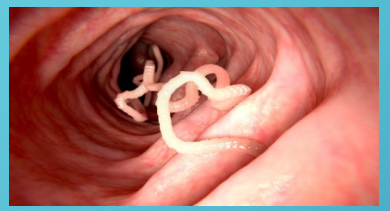
- Disease labeling carries with it the unintended consequence of muddying the water for the quest to finding the actual source(s) of symptoms, thus delaying or even hindering finding cures or lasting remedies
- In allopathic reductionism, treating the symptom (usually with a chemical) has taken precedence over treating the body as a whole, which gives temporary relief, while the elephant remains in the room.
- Many health issues can involve anatomical, biomechanical, biochemical, and psychophysiological problems (or any combination thereof).

CAUSE OR CONSEQUENCE, THAT IS THE QUESTION

- **When it comes to disease, there are only 4 things which we can "catch":**

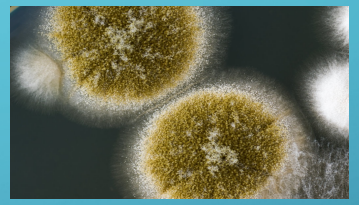
viruses

bacteria



parasites

fungi



- Nearly everything else is a consequence of how we function, or dysfunction: what we allow in, what we are exposed to, what we apply, how we live, and how we react.

FUNCTIONAL VS DYSFUNCTIONAL: WHAT'S THE DIFFERENCE?

❖ ***Functional* Breathing has "EAARS":**

a. Efficient
b. Adaptive
c. Appropriate
d. Responsive
e. Supportive

- Hence, when breathing is functional, it operates very well **biomechanically** and **biochemically**

  a. **biomechanically** (neuromuscular respiratory pump) **-** creating changes in the intra-abdominal and intra-thoracic pressures that drive air movement, blood and lymph flow

  b. biochemically- balancing blood gases and body chemistry

* Functional breathing is also very important in "non respiratory" functions, such as self regulation of mental/emotional states, phonation/vocalization, homeostatic rhythms/oscillations, spinal/trunk stability, posture/motor control, digestion

WHAT DOES FUNCTIONAL BREATHING LOOK LIKE?

- It is not noticed
- It is nasal
- It is quiet
- It is abdominal

What is common among these people?

HOW MUCH AIR DO WE BREATHE PER BREATH?

- Breathing is measured by multiplying the respiratory rate times the volume of air breathed into the lungs. This is known as “minute ventilation”, which is measured in liters per minute.
- Normal , or functional breathing is typically 4 to 6 liters per minute
- The average moderate asthmatic and person with sleep apnea have a minute ventilation anywhere from 10 to 15 lpm!
- That means, too much carbon dioxide is being expelled from the body, affecting the health in many ways.

X 4

FUNCTIONAL VS DYSFUNCTIONAL: WHAT'S THE DIFFERENCE?

- Dysfunctional breathing then is:
- Not efficient
- Not adaptive
- Not appropriate
- Not responsive
- Not supportive

WHAT DOES DYSFUNCTIONAL BREATHING LOOK LIKE?

- Very noticeable
- Not quiet
- Not abdominal
- Not nasal

Notice the tongue position (tongue thrust)

DYSFUNCTIONAL BREATHING TRAITS

- Mouth breathing
- Breathing is audible during rest
- Regular sighing
- Regular sniffing
- Taking large breaths prior to talking
- Yawning with big breaths
- Upper chest movement
- Lots of visible movement
- Not quiet

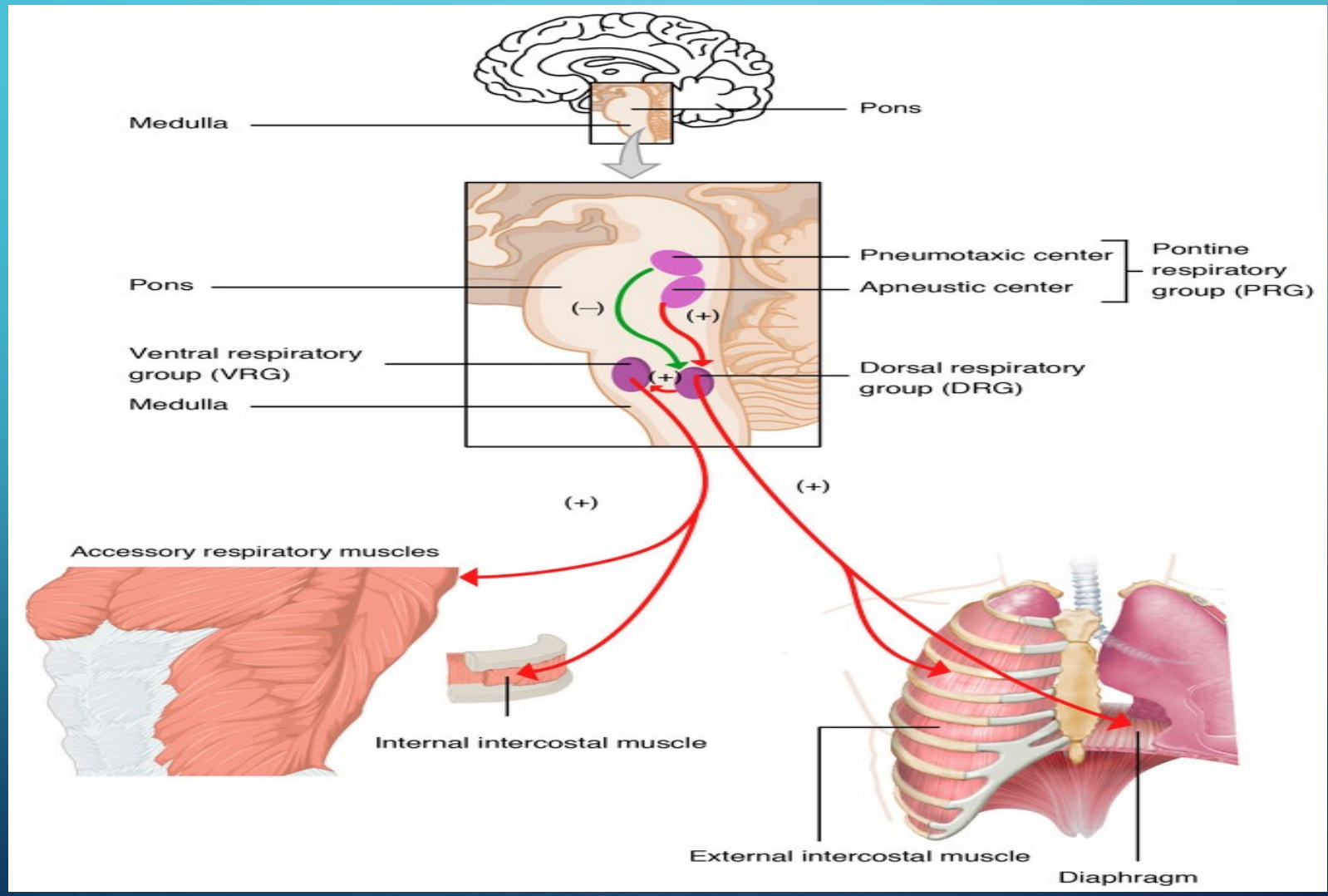
SOME CAUSES OF DYSFUNCTIONAL BREATHING

- Over eating
- Processed foods
- Excessive talking
- Stress
- Anxiety
- Misconception that big breathing is beneficial
- High temperatures in houses
- Poor lifestyle

DYSFUNCTIONAL BREATHING : LARGELY A PRODUCT OF THE INDUSTRIAL REVOLUTION AND WESTERN CULTURE

WHAT DRIVES OUR BREATHING?

- Chemoreceptors in the brain stem sense oxygen and carbon dioxide levels



CARBON DIOXIDE (CO_2)

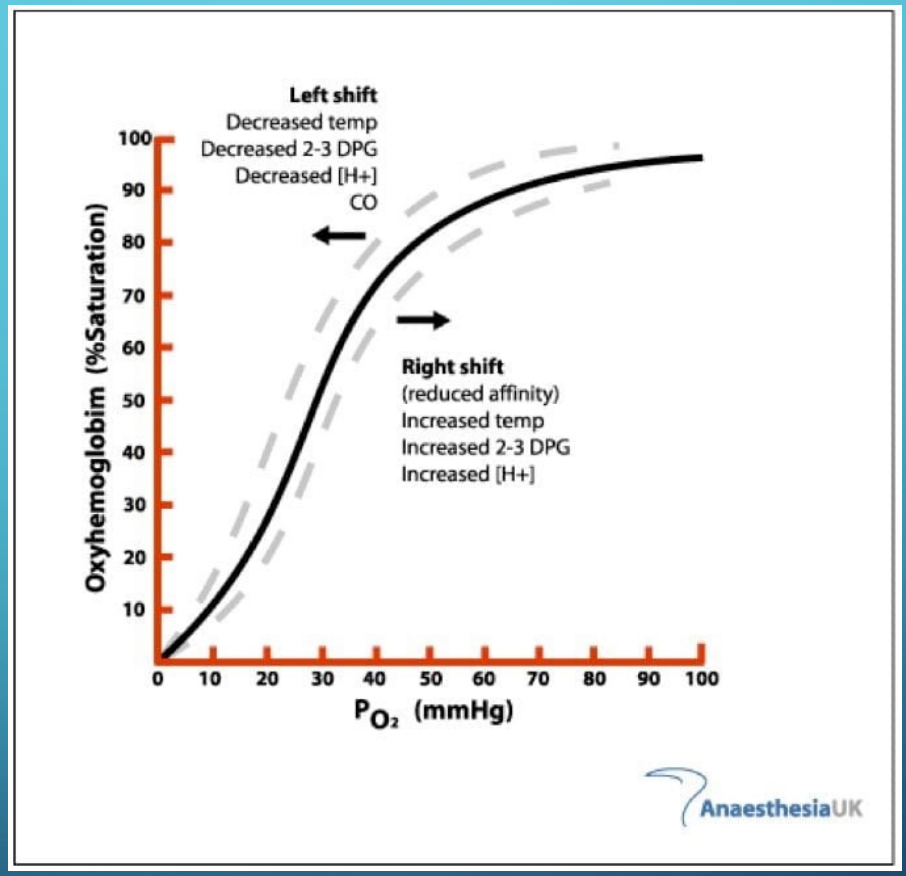
- Oxygen reserves in the blood plasma must drop to nearly one half before the brain stimulates breathing; 100 mmhg to 50 mmhg
- CO_2 need only increase from 40 mmhg to 46 mmhg before the the brain sends signals to increase breathing. It is much more sensitive.
- Breathing will be slowed when CO_2 goes from 40 mmhg to 34 mmhg.
- CO2 is **THE** primary stimulus to breathe

CHRONIC HYPERVENTILATION SYNDROME

- Over a 24 hour period of time, the body and brain can be conditioned by dysfunctional breathing, a phenomenon which is called neuroplasticity
- In chronic conditions, the blood pH, controlled by carbon dioxide (CO_2) levels, and blood bicarbonate, will adjust to the imbalance over time (COPD), keeping the blood pH in a normal state of balance.
- The body gets accustomed to dysfunctional breathing, and it soon becomes "normal".
- The effects are not "normal". It throws many physiological functions into disarray.

DECREASED OXYGEN LEVELS OCCUR WITH BIG BREATHING

In science, the O2 dissociation curve is used to show how different conditions affect the binding of oxygen to the hemoglobin



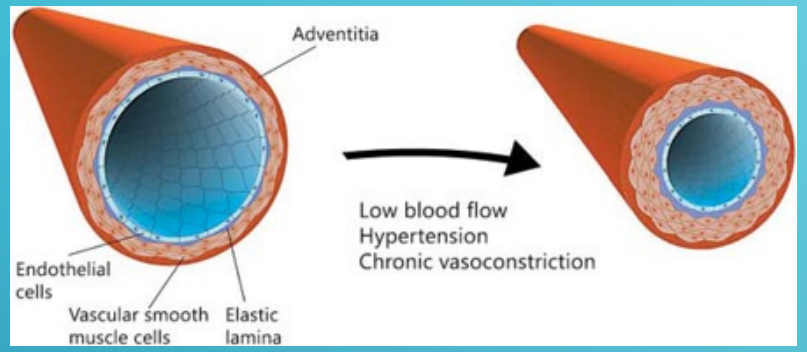
Carbon dioxide levels in the blood are a major factor in whether oxygen binds tightly to hemoglobin, or is readily released at the tissue level.

O2 DISSOCIATION CURVE CONT.

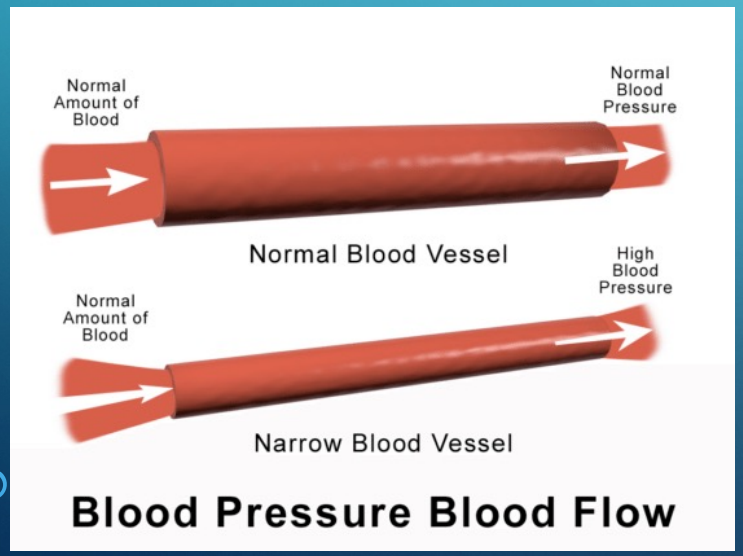
- Muscles in exercise generate higher levels of CO_2 from metabolism. They then benefit from an increase in oxygen uploading from the capillary beds

ILL EFFECTS OF CHRONIC HYPERVENTILATION

- Decreased oxygen availability through vasoconstriction



- Increased blood pressure

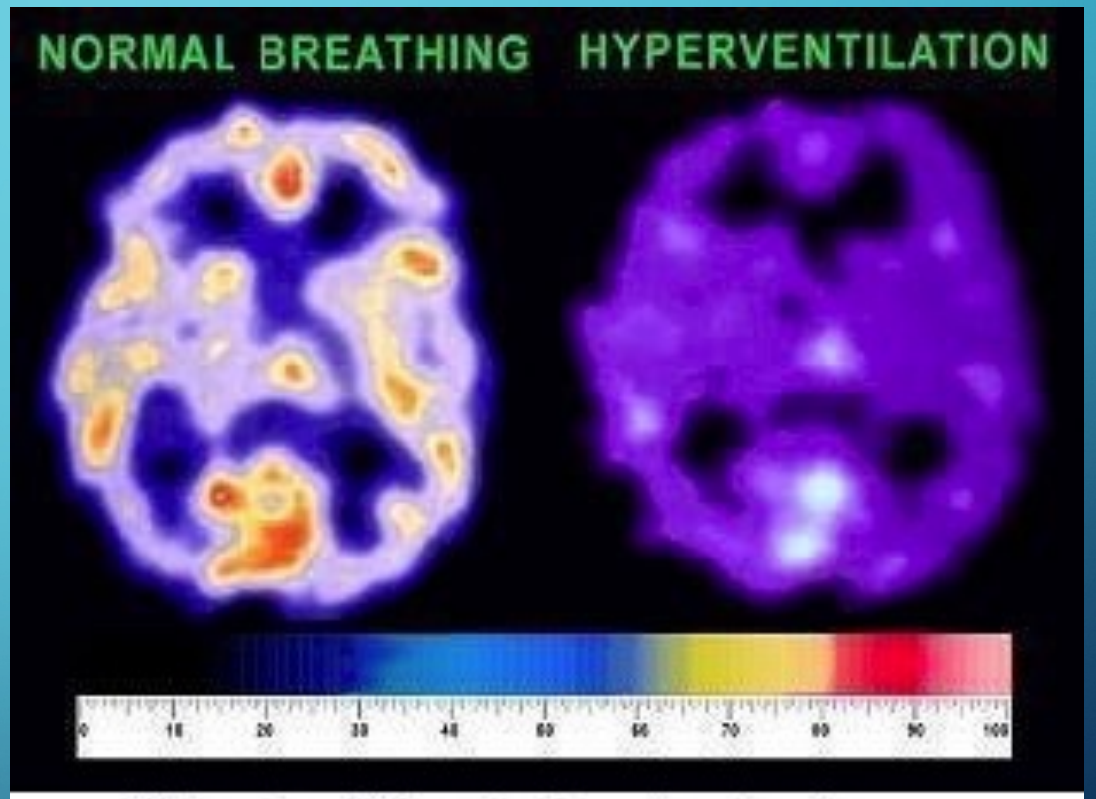


CO_2

ILL EFFECTS OF CHRONIC HYPERVENTILATION CONT.

- Decreased blood flow to the brain

1. Dizziness
2. Instability
3. Faint feelings
4. Headache
5. Paresthesia
6. Brain fog
7. Heaviness
8. Anxiety



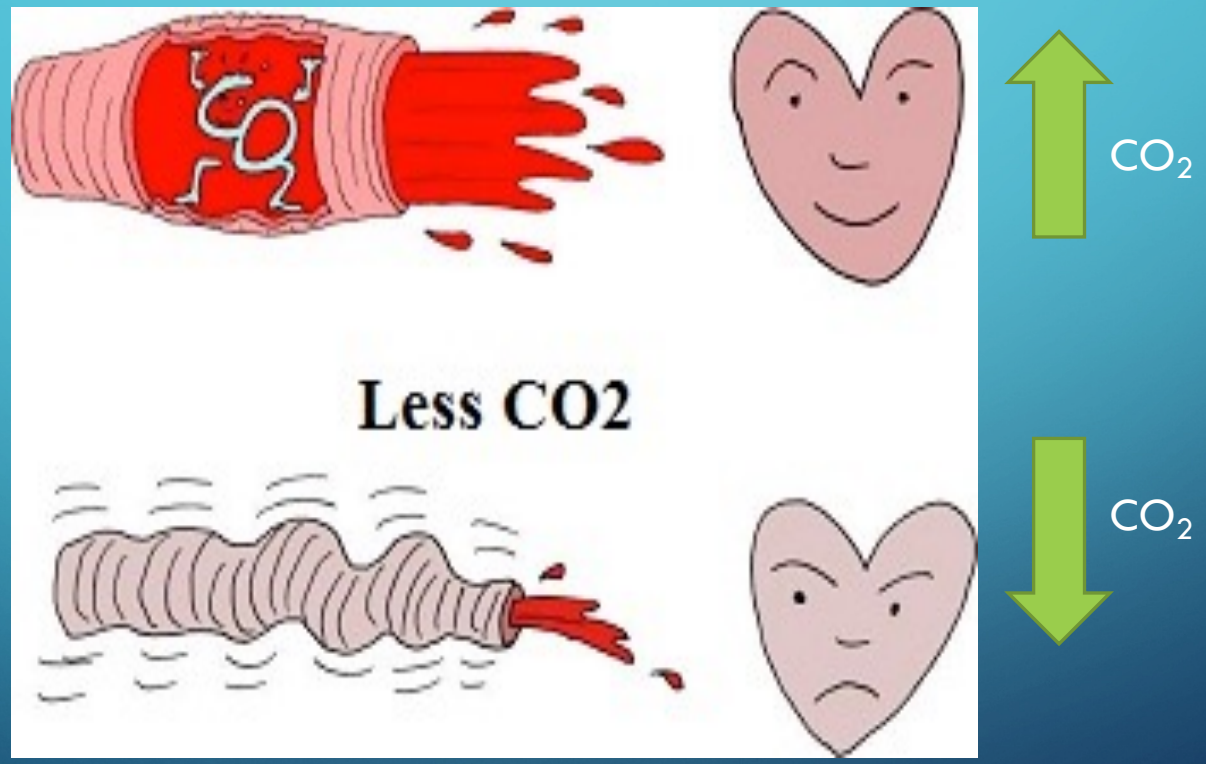
Effects of 1 minute of voluntary hyperventilation on brain oxygen levels (vasoconstriction due to a lack of CO2)

NormalBreathing.Org

ILL EFFECTS OF CHRONIC HYPERVENTILATION CONT.

- Decreased blood flow to the heart

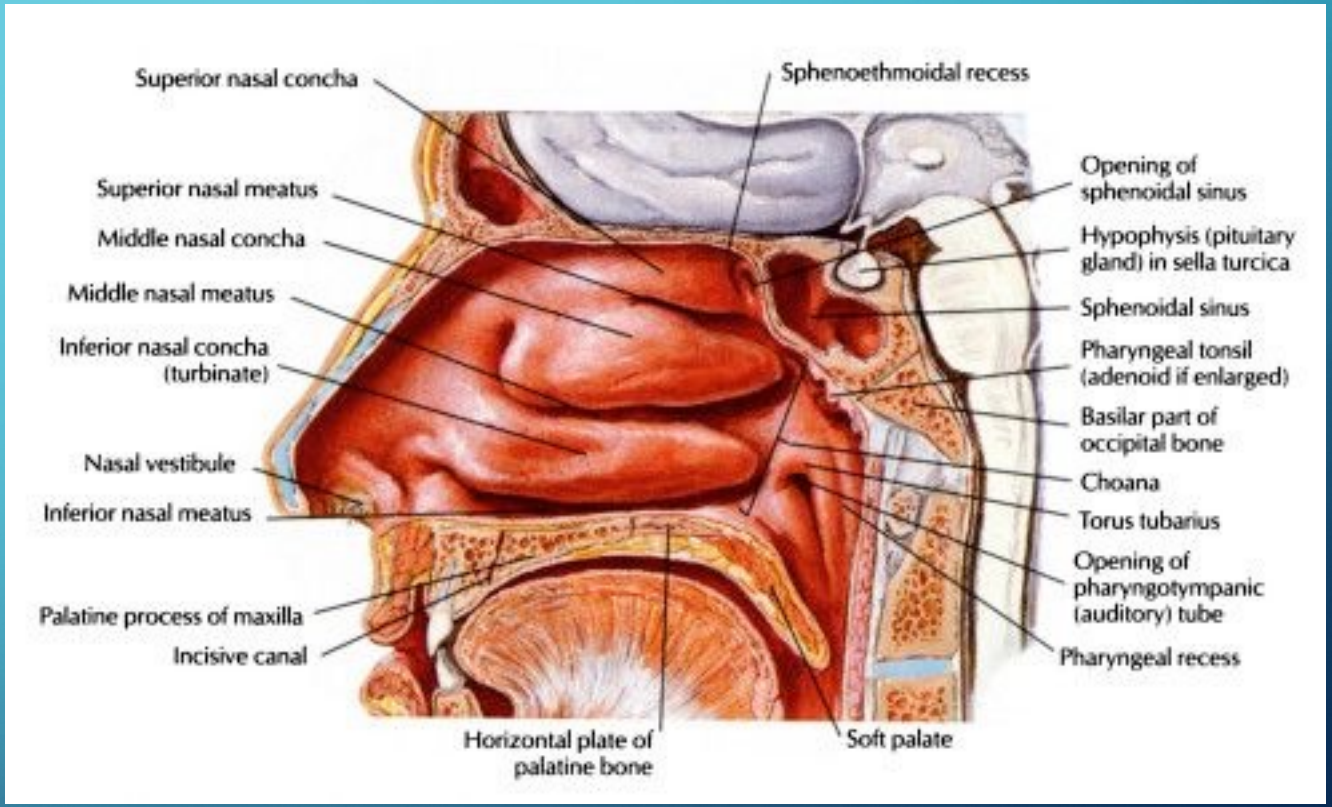
1. Palpitations
2. Irregular beat (atrial fibrillation)
3. Tachycardia
4. Angina
5. Reynaud's
6. In some cases, heart muscle damage



THE NOSE

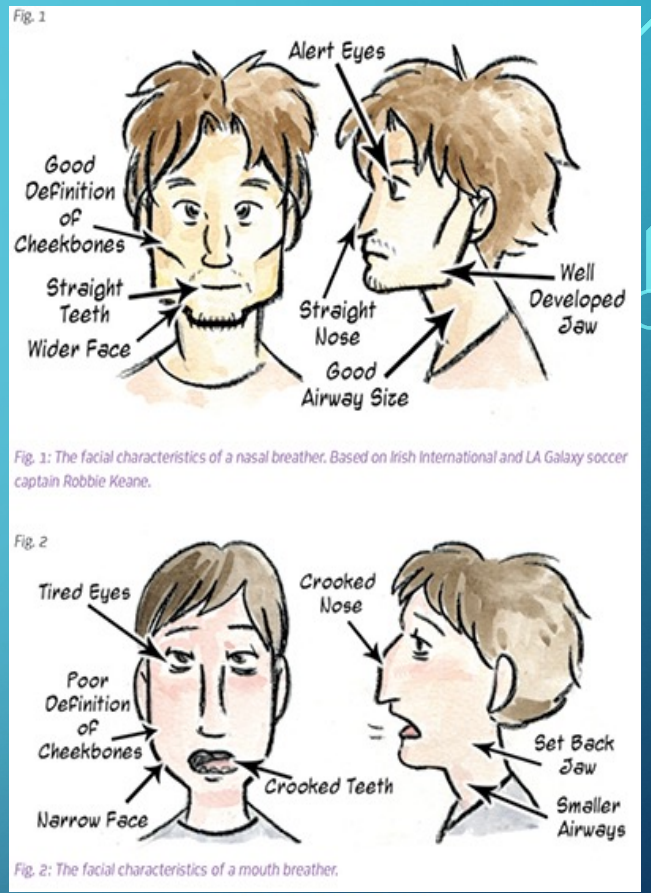
Nasal breathing:

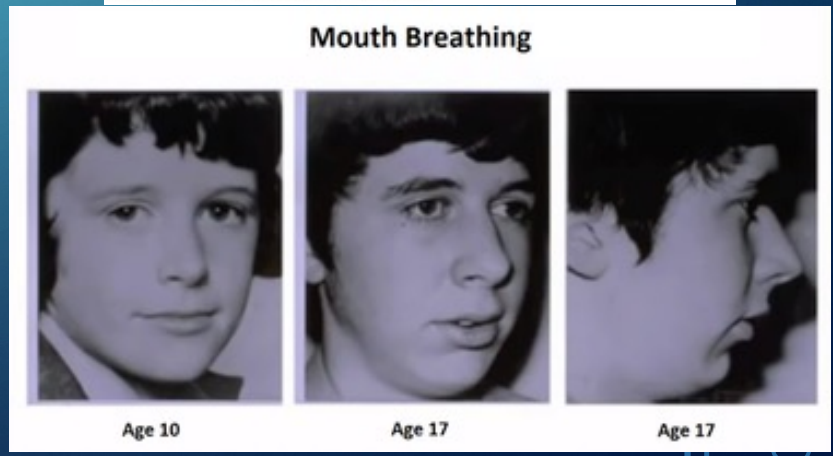
1. Filters the air
2. Heats the air
3. Humidifies the air
4. Enables smelling
5. Enables taste
6. Enables equilibrium in the middle ear
7. Produces nitric oxide
8. WAS DESIGNED FOR BREATHING



MOUTH BREATHING

- Does not filter the air
- Does not efficiently heat and humidify the air
- Does not produce nitric oxide
- Increases dental carries and gum disease
- Increases the occurrence of asthma, sleep apnea, snoring
- Contributes to increased risks of forward head posture and reduced respiratory efficiency
- Can alter the facial features

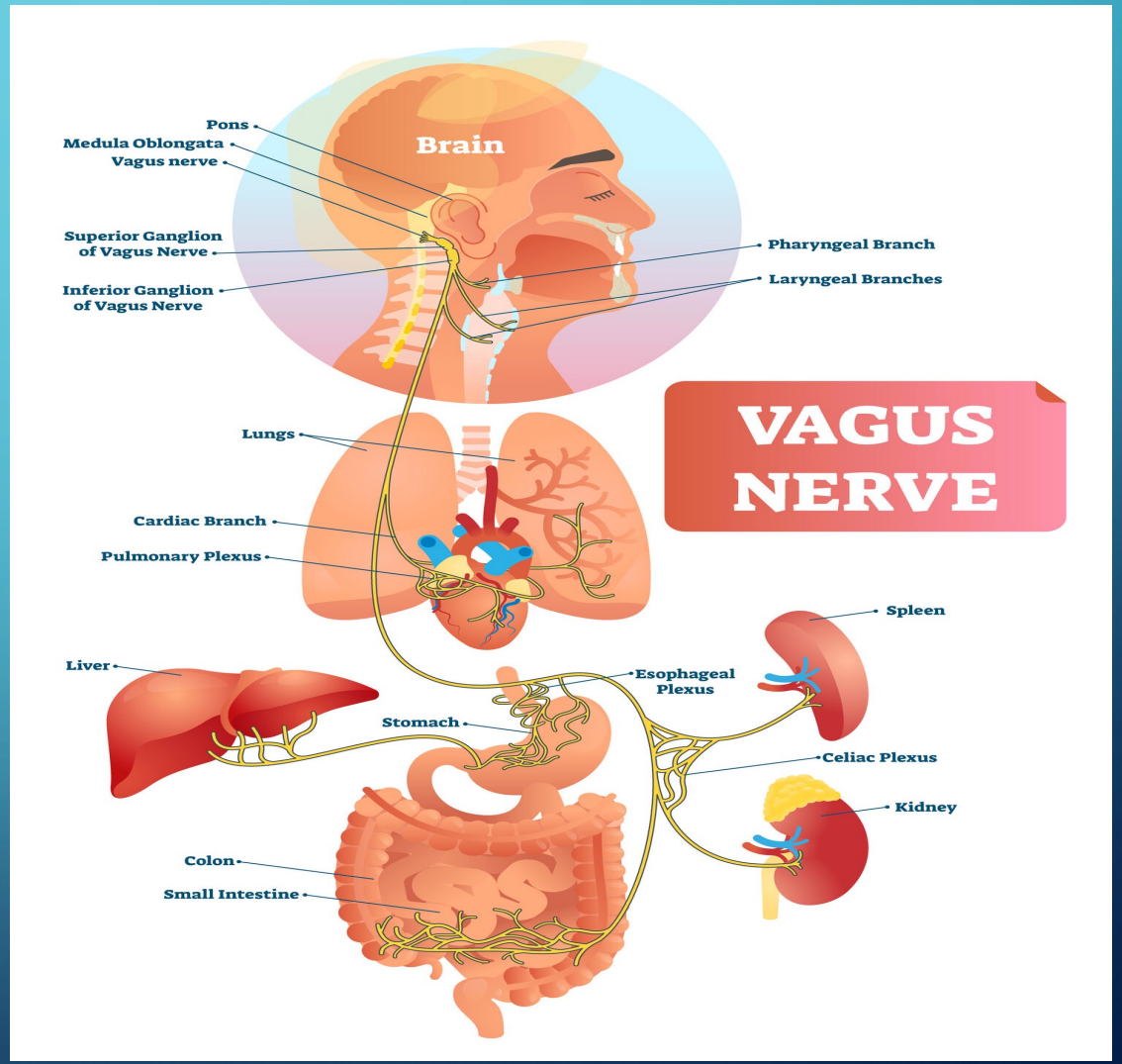




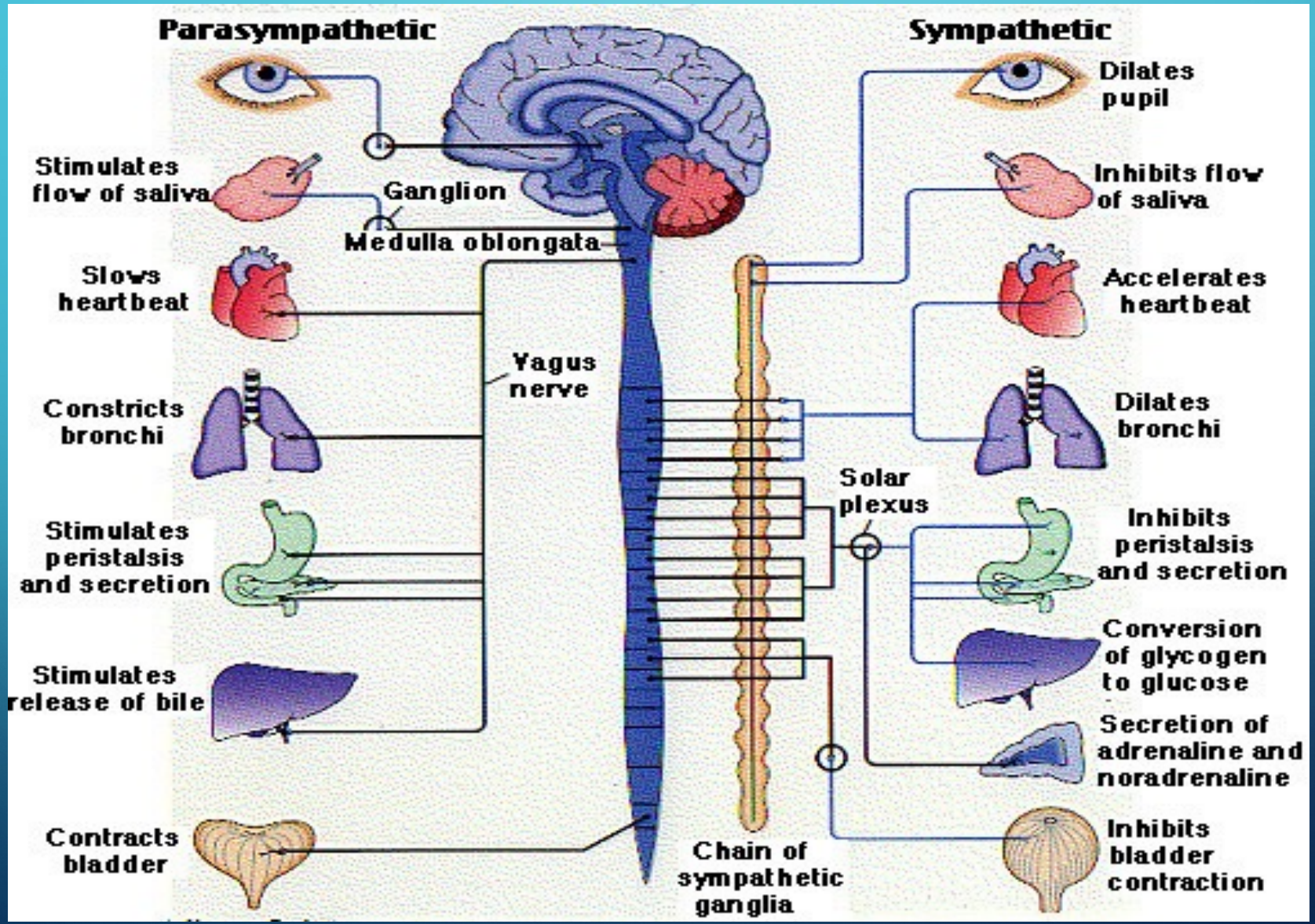
THE VAGUS NERVE AND BREATHING

The vagus nerve is the largest nerve complex in the body. It starts at the medulla in the brain stem and innervates nearly every organ, including much of the gut. Hence, the term “Gut is brain” is a very accurate statement.

The vagus nerve is greatly affected by breathing patterns and oscillations, as well as carbon dioxide levels. Vagal nerve stimulation directly affects heart rate variability and our autonomic nervous system.

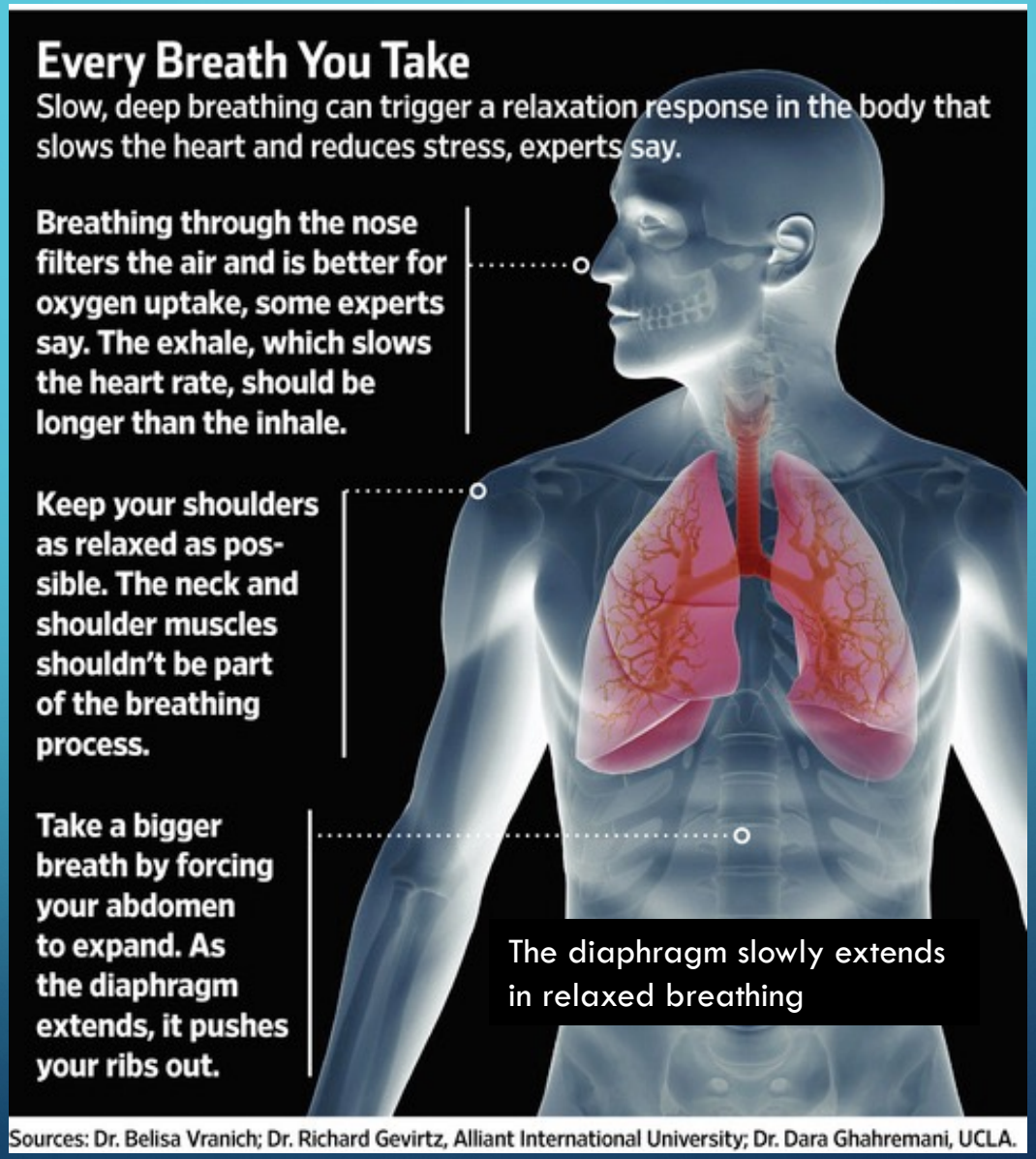


THE VAGUS NERVE RESPONSE



BREATHING AND THE VAGUS NERVE

Diaphragmatic, controlled breathing stimulates the vagus nerve and produces a parasympathetic state



BREATHING AND IMMUNITY

- It's been shown that nasal breathing can decrease viral loads due to nasal filtering and nitric oxide levels in the nasal passages
- Increased stress levels decrease the body's ability to effectively fight disease: viral, bacterial, or other forms, such as some types of cancer. Functional breathing lowers stress levels by putting us in a parasympathetic state, thus strengthening the immune system
- Misha Sakharoff and Katrine Flindt have a clinic in Sweden and use their Metabolic Program to treat people with various metabolic anomalies, including some brain tumors (glio blastoma multiforme). The program includes breathing retraining, a carnivorous diet, and moderate exercise. They have seen many successful cases of disease reversal, including shrinking and / or dissipation of brain tumors.

LET'S TRY SOME BREATHING RETRAINING!

- First, we'll do what's called a Control Pause. The purpose is to determine your level of CO_2 tolerance.
- Next, we'll practice some reduced breathing.

READY?

CONTROL PAUSE (CP)

- Start by sitting up straight, getting into a very relaxed state
- Next, we'll do 1 minute of very relaxed, diaphragmatic, nasal breathing
- Next, I'll count to 3, then have you take a small breath in, exhale, and hold your breath while gently pinching your nose
- As you hold your breath, watch the clock. Stop the exercise at your first gentle urge to breathe (may be a twitch in the neck, or a slight urge to want a breath). Make sure you take note of the number of seconds you have held your breath.

READY?

RELAXED BREATHING

- To do this, we'll need to either remain, or get into a relaxed state while sitting up straight with feet flat on the floor.
- I will have everyone close their eyes and listen to my instruction, while focusing on the breathing.
- This must be done while nasally breathing, using the diaphragm only.

READY?

ADDITIONAL BREATHING RETRAINING EXERCISES

3. **Walking with the mouth closed:** 30 minutes daily

4. **Walk with short breath holds**

5. **STEPS**

6. **Many small breath holds:** used to ward off bronchospasm or panic attacks

-After normal breathing, exhale through the nose

- Pinch the nose and hold breath for 3 to 5 seconds

- Resume breathing for 10 seconds

- Repeat until symptoms subside

BREATHING RETRAINING EXERCISES

- **Resonance Frequency Breathing (RFB)**
  a. This is breathing that reduces the breath cycle to 6 breaths per minute.
  b. It is an excellent breathing pattern, as it brings one into coherence* with heart rate variability, and stimulates the vagus nerve to create a parasympathetic state

*Reaching a state of coherence involves focusing the mind on love, appreciation, and / or thankfulness while engaging in RFB.

CAVEATS

- In addition to the exercises, other changes are warranted:

1. No over eating, and eat only whole foods
2. Sleep lying on the left side when at all possible
3. Keep the house temperature, especially the bedroom, under 70 degrees while sleeping
4. Avoid blue light electronics at least 30 minutes (preferably 1 hour) prior to bedtime
5. Wind down, reduce thinking about the day's activities, and attempt to get into a meditative state at bedtime, reducing the breathing just before retiring
6. Regular exercise is a vital part of success

CAVEATS

- As stated earlier, dysfunctional breathing is a learned behavior, which is the psychophysiological aspect of the problem.
- Many times, sentinel events in the life of a person can trigger dysfunctional breathing (Tim)
- Getting the client to realize the pathogenesis of their problem will contribute to lasting change, provided they are willing to make the change

QUESTIONS?