

Chapter **2****Perform in the Memletic State**

*You learn faster if your cells, body and mind are in good condition, or good “state.” Memletic State describes the best state for learning. This chapter shows you what Memletic State is, and how to achieve it. We look at the benefits of general health and fitness right through to the latest results from brain research. Being in Memletic State doesn’t just increase your memory and learning performance. Memletic State is the peak condition for performing well in many human endeavors, from flying a plane to playing football.*

Memletic State is when your body and mind are in the best condition for learning. This chapter tells you how to get in that state. Applying the information in this chapter will increase your learning performance without using any of the other techniques in this book. Being in Memletic State also helps improve your health and well-being, with resulting benefits in many other areas of your life.

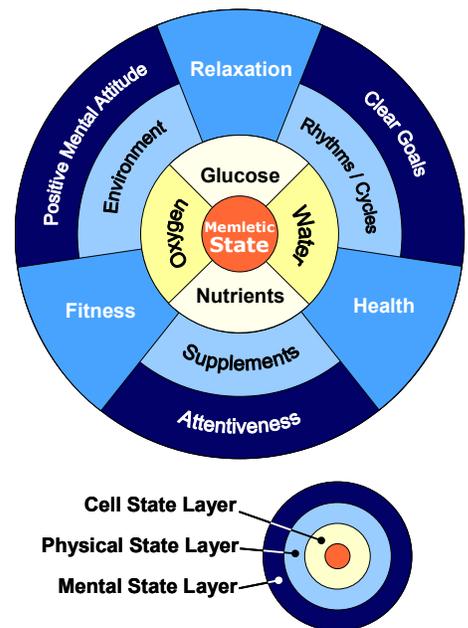
I’ve grouped the major contributors to Memletic State into three layers. These are the cell, physical and mental state layers. In summary, the elements that make up each of these layers are:

- **Cell State Layer:** Water, Glucose, Oxygen, and Basic Nutrients.
- **Physical State Layer:** Health, Fitness, Relaxation, Environment, Sleep and Body Rhythms, and Supplements.
- **Mental State Layer:** Health, Fitness, Relaxation, Attention and Concentration, Positive Mental Attitude, and Goals.

The learning state diagram below shows these layers and elements. Cell state is fundamental and therefore the innermost layer. You will find it hard to learn without satisfactory functioning of cells. The next layer is the physical state layer. These elements impact how well you breathe, circulate blood, fight off illness and more. The outer layer is the mental state layer. The elements of this layer are within our mind. Notice how cell state layer supports the physical state layer, and the physical state layer supports the next layer out, the mental state layer.



**CAUTION.** This chapter includes information on health and fitness. This is not specific advice for your personal situation. Applying the content in this chapter may involve changes to your diet, physical activity levels and other day-to-day



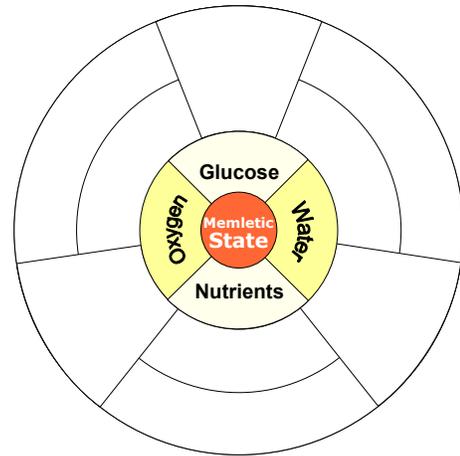
behaviors. If you plan to make changes to these areas, you should always consult a medical practitioner or other appropriate specialist. Discuss activities that may affect particular illnesses or conditions you have. This applies in particular to:

- Breathing exercises if you have any lung illness or condition
- Physical exercise if you are unfit or have a heart or lung condition.
- Supplements, especially if you suffer any form of illness or are on any medication.

## ***Cell state—ensure your brain cells are well nourished***

Good cell state ensures an adequate supply of materials that brain cells, primarily neurons, need to work. Like other human cells, Neurons need water, energy and oxygen. Neurons and other cells around them also need certain nutrients to work effectively. The lack of any of these basic materials significantly decreases your ability to learn, even to live. Ensuring your brain has a good supply of all these materials provides a solid base on which the other learning state layers can perform well.

The four materials we examine in cell state are glucose, oxygen, basic nutrients and water.



### **Glucose**

Your brain needs much energy. Nerve transmission, or signals passing from one neuron to another, consumes over half of the energy used by your brain. This can be over ten percent of your body's total energy use. The brain's neurons consume more energy during learning and other mental activities.

Each neuron takes mainly one form of sugar, glucose, and burns it with oxygen to supply its energy needs. Neurons use this energy to fire when triggered, for growing new connections, and for general cell maintenance.

Neurons cannot store glucose. They can only get it, when needed, from the bloodstream. The hippocampus, one particular area in the brain, suffers when it cannot get enough glucose. As the hippocampus helps sort and store key types of memories, any lack of energy in this area results in less effective learning. Low blood glucose directly affects other areas of the brain as well. For example, low blood glucose results in slower processing of visual and auditory information.

Your body gains glucose mainly from the carbohydrates in the foods we eat. The stomach breaks carbohydrates into glucose, which is a simpler carbohydrate. In some foods, the sugar is already glucose and it passes directly into the bloodstream.

So how do you keep up good levels of blood glucose? Eat complex carbohydrates from plant-based foods such as grains, legumes, fruits and vegetables. These provide the best form of carbohydrates because they take time to break down in the stomach. They release their glucose over several hours.

Not all forms of carbohydrates are good for boosting brain performance though. Avoid large injections of sugar such as soft drinks, cakes, chocolate, and other refined sugary foods. While it may seem these should help your brain work well, it's only a temporary effect. With such a large change in blood glucose, your body releases large amounts of insulin, a compound that regulates the levels of sugar in your bloodstream. The presence of insulin signals various parts of the body to take glucose from the blood. The body turns that excess glucose into compounds that store the energy for later use. It turns the glucose into fat.

Because these sugars in these foods are short lived, the body soon finds itself with not enough glucose and too much insulin in the blood. This causes large swings between too much and then too little sugar in the blood. These swings result in you feeling tired or spaced out within a few hours after consuming such a food or drink. If you then consume another high sugar snack, off goes the process again. These swings, over time, can reduce your body's sensitivity to insulin. This can result in diet-induced diabetes.

What is the lesson to take away from this? Eat a diet rich in complex carbohydrates from whole grain foods, vegetables, fruits and nuts. Don't skip breakfast, and don't "load up" on sugary foods before class and especially not before exams. Before a long exam or other mentally intensive activity, eat a good meal with both proteins and complex carbohydrates. Also, if allowed, take in wholesome snacks that you can eat each hour or so, *before you feel hungry.* 🍌

A last point about brain energy is that eating a large meal can negatively affect brain performance. Glucose gets to the brain via your bloodstream. After eating a large meal, the body diverts blood to the stomach to digest the incoming food. This diversion of blood takes blood away from the brain. This leaves you feeling tired or sleepy (especially after a big Sunday lunch). Avoid eating a large fat- and protein-rich meal directly before class, training, a performance or an exam if you want your brain performing at its best!

### Where is memory located?

#### A short history:

This question has been asked by humans for thousands of years. Through the ages there have been a range of theories.

The ancient Greeks thought that many of the brain's functions were located in the heart. Aristotle thought along similar lines, and that the brain was primarily there to cool the blood. Intelligence, according to this theory, could be measured by the amount of cooling required, hence the size of the human brain.

From around 200 AD to 1400 AD the popular theory was that memory was located in the ventricles, the liquid filled spaces in the brain. Leonardo da Vinci helped dispel this theory.

In the early 1900's a Spaniard determined the basic roles of neurons and synapses. This is the basis of our current view of memory being a complex network of neurons.

## Oxygen

As mentioned above in the section on energy, each neuron burns glucose with oxygen to obtain energy. How does oxygen get from the air outside our body to the cells within our brain? Oxygen enters the bloodstream through our lungs. The oxygen attaches itself to special proteins in the blood. The blood then transports oxygen to the brain via blood vessels, and these vessels break down into smaller and smaller pathways until they become capillaries. Capillaries weave throughout the brain and flow close to each neuron. When needed, oxygen detaches itself from the blood and flows into the neuron.

While your brain is only around three percent of your body mass, it can consume more than twenty percent of your body's oxygen intake. Its consumption increases during mental activities such as learning. Let's look at ways to ensure your oxygen use is ideal for learning. This involves good blood efficiency, good lung efficiency, good pulse rate and strength, and good breathing.

### ***Good blood efficiency***

Blood efficiency is how well your blood takes up, transports and releases oxygen. The key nutrient that helps your blood transport oxygen is iron. Be sure to get enough iron in your diet. Good sources include wholegrain cereals and breads, green leafy vegetables, and meat (especially red meat). Vitamin C also helps absorption of iron.

Iron deficiency is common in western diets, especially in women and vegetarians. If you regularly feel tired, have less energy, or look pale, see a medical practitioner to have a blood check. Not all people display symptoms of anemia, so why not ask for a test next time you visit the doctor. Too much iron is not good for you either—another reason to check.

### ***Good lung efficiency***

Efficient lungs more easily move oxygen into your blood. They also do a better job at removing carbon dioxide. Here are four ways you can support and improve lung efficiency:

- **Eat your fruits, vegetables and grains.** Anti-oxidants such as vitamins E and C, and beta-carotene can improve how well your lungs work. The best source of these anti-oxidants is from a diet rich in fruit, vegetables and grains.
- **Stay fit.** Aerobic fitness improves your lung efficiency, both during exercise and during rest.
- **Try a lung exerciser.** These are fairly new products on the market that provide variable resistance to breathing. They look similar to an asthma inhaler. Used for a few minutes a day these appear to improve lung efficiency. Brand names include PowerLung™ and PowerBreathe™.
- **Don't smoke.** Smoking drastically reduces lung efficiency.

### ***Good pulse rate and strength***

Increasing your pulse rate and strength increases the blood flow into the brain. This increases both oxygen and glucose availability. You can improve your pulse rate during learning as well as over a longer term: