**RESOURCES AND PARTIAL ANSWERS SHEET for BREATHING LESSON**

<https://covid19criticalcare.com/wp-content/uploads/2020/12/FLCCC-Protocols-%E2%80%93-A-Guide-to-the-Management-of-COVID-19.pdf>

N95 masks are made in several layers. The middle filtering layers are made of polypropylene fibers with an embedded electrostatic charge. FE is achieved by both the mechanical structure of the polypropylene filter layer and the electrostatic charge. The electrostatic charge can augment the mechanical filtering efficiency by as much as 10 to 20 times. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7161499/>

Normal TV (tidal volume or air volume that is breathed in during a single breath) – 500 ml 2. Normal Rf (respiratory frequency or [respiratory rate](http://en.wikipedia.org/wiki/Respiratory_rate)) – 12 breaths per minute 3. Inspiration – about 1.5-2 seconds 4. Normal exhalation is 1.5-2 seconds, followed by an automatic pause (no breathing for about 1-2 seconds). e-breathing.com Normal breathing strictly tends to be nasal (in and out), slow (in terms of frequency), mainly diaphragmatic (i.e. abdominal) and imperceptible (or small/shallow in terms of its volume).

About 70% of a human's total energy expenditure is due to the basal life processes taking place in the organs of the body (see table). About 20% of one's energy expenditure comes from physical activity and another 10% from [thermogenesis](https://en.wikipedia.org/wiki/Thermogenesis), or digestion of food (*postprandial thermogenesis*).[[29]](https://en.wikipedia.org/wiki/Basal_metabolic_rate#cite_note-29) All of these processes require an intake of oxygen along with coenzymes to provide energy for survival (usually from macronutrients like carbohydrates, fats, and proteins) and expel carbon dioxide, due to processing by the [Krebs cycle](https://en.wikipedia.org/wiki/Krebs_cycle).

|  |  |
| --- | --- |
| **Energy expenditure breakdown**[[28]](https://en.wikipedia.org/wiki/Basal_metabolic_rate#cite_note-Durnin-28) | |
| [Liver](https://en.wikipedia.org/wiki/Liver) | 27% |
| [Brain](https://en.wikipedia.org/wiki/Brain) | 19% |
| [Skeletal muscle](https://en.wikipedia.org/wiki/Skeletal_muscle) | 18% |
| [Kidneys](https://en.wikipedia.org/wiki/Kidneys) | 10% |
| [Heart](https://en.wikipedia.org/wiki/Heart) | 7% |
| Other [organs](https://en.wikipedia.org/wiki/Organ_(anatomy)) | 19% |

**https://www.webmd.com/a-to-z-guides/is-it-safe-to-hold-your-breath**

Medically Reviewed by [Dan Brennan, MD](https://www.webmd.com/dan-brennan)on April 08, 2021

There are many reasons why you may hold your breath. You may hold your breath while swimming, before playing a wind instrument, or just to see how long you can hold it. It's hard to hold your breath for long periods of time because your body needs oxygen, and it gets it by breathing.

**You don't have to think about breathing. Your body breathes automatically. Holding your breath goes against what your body is designed to do.**

## What Happens When You Hold Your Breath?

The first thing that happens when you hold your breath is oxygen levels decrease. Then, carbon dioxide levels increase because your body gets rid of that gas by breathing out. This state is called [hypoxia](https://www.webmd.com/asthma/qa/what-is-hypoxia). After just a minute or two, your cells start to behave differently than they normally would. This can affect all of your organs.

If you hold your breath for too long it can cause your heart to start beating irregularly. It can damage your [kidneys](https://www.webmd.com/kidney-stones/picture-of-the-kidneys) and [liver](https://www.webmd.com/digestive-disorders/picture-of-the-liver).

Holding your breath also causes the amount of carbon dioxide building up in your body to cross the blood-brain barrier. Your brain notices this change and increases your body's desire to inhale and exhale. If you still don't breathe at this point, you can have a [seizure](https://www.webmd.com/epilepsy/understanding-seizures-basics), [faint](https://www.webmd.com/a-to-z-guides/ss/slideshow-what-makes-you-faint), or even injure your brain.

**Normal Breathing for an Adult**

12/breaths/minute X 60 = 720breaths/hour

6 Liters a minute X 60 =360L/hour Normal for 8 hours day = 2,880

**@30% reduction**

504 breaths/hour

252 L/hour = 2,016/8 day