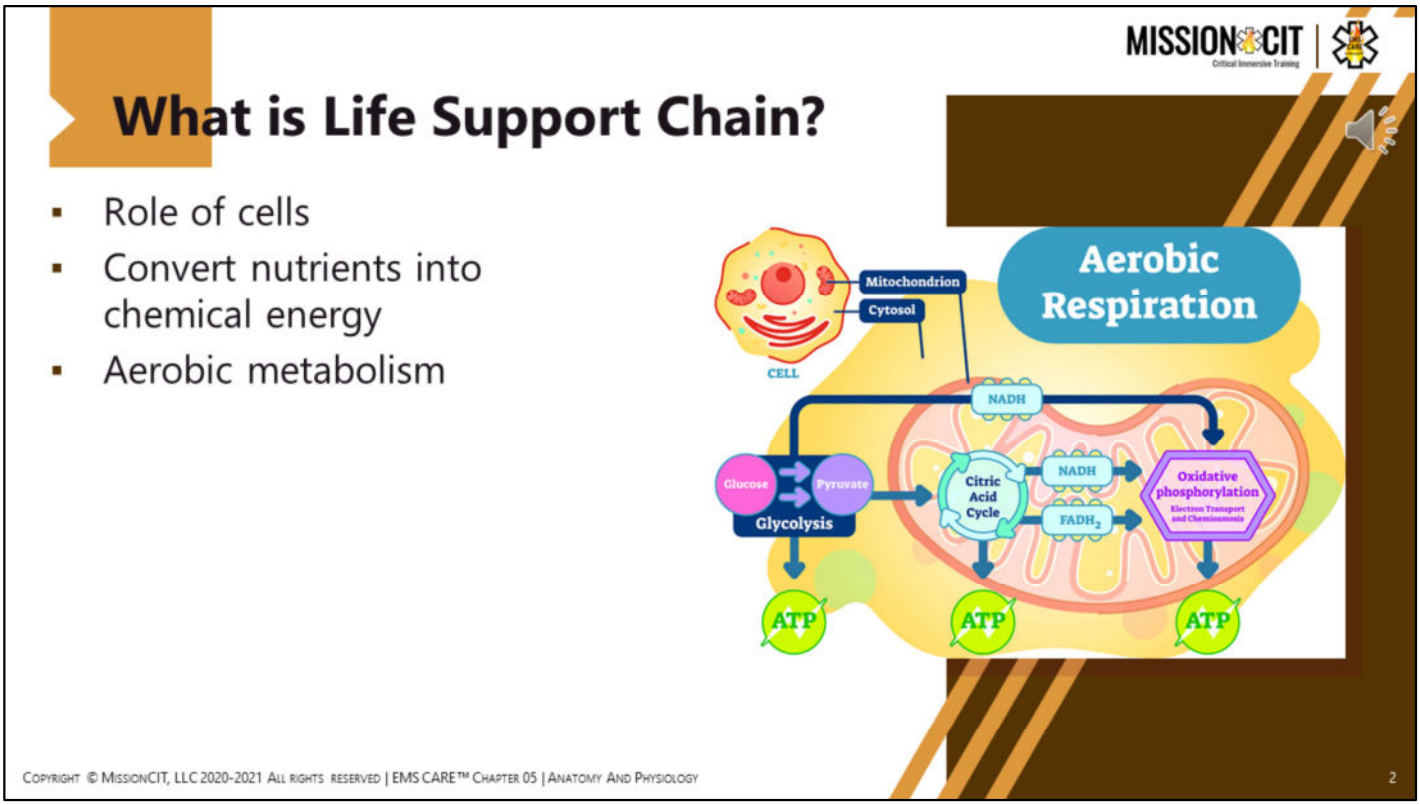


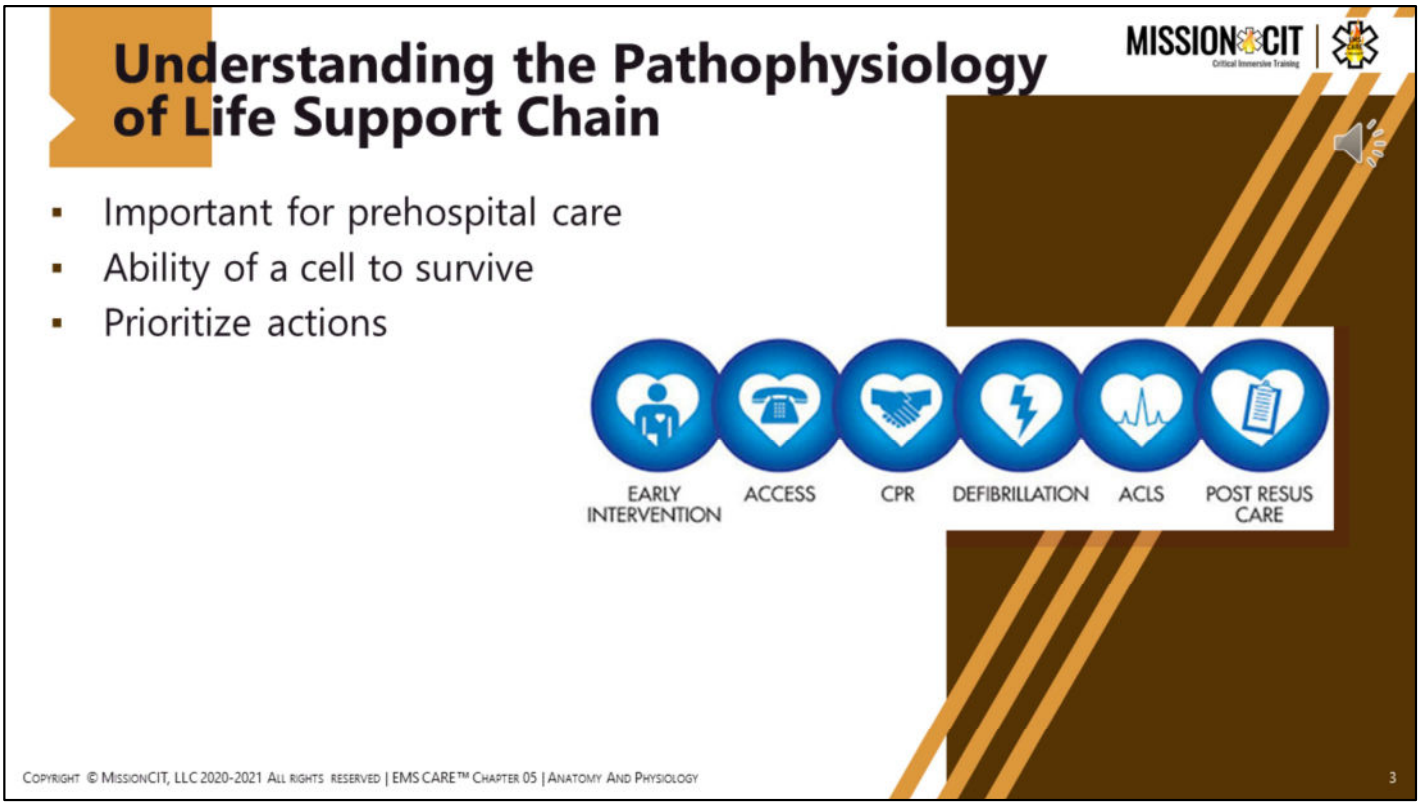
Thank you, Justin!

Welcome to this lesson where we talk about the life support chain along with the possible factors that can affect it.

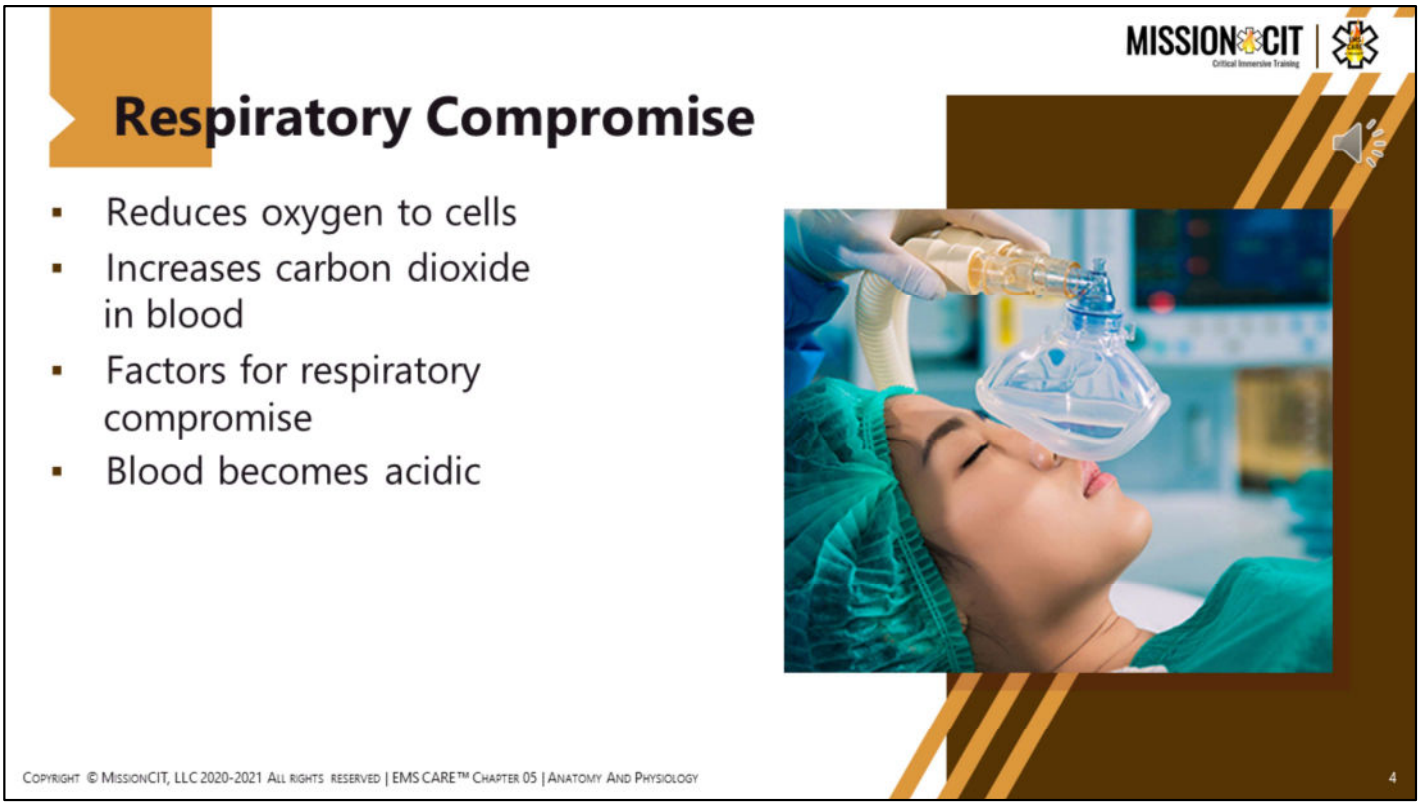


The life support chain is the cells and organs that keep life flowing in every human being or any organism for that matter. It includes all the cells in the body that continuously require oxygen and nutrients to function, and also create waste and byproducts that have to be eliminated. The respiratory and circulatory systems are the carriers of this supply and waste and if there is any interference, the cells become damaged and die.

The cells convert the nutrients to chemical energy through metabolism. This leads to the creation of the Adenosine triphosphate or ATP to store the energy. This metabolism process requires oxygen, and this is why this process is aerobic metabolism. But cells are super-efficient too, as they switch to anaerobic metabolism when oxygen is not available in required quantities for brief periods.



Understanding and studying the functional changes that occur in the body as a reaction to disease is critical to providing appropriate prehospital care to the patients. Remember, your course of action impacts the ability of a cell to survive and thrive. When you look at a condition from this perspective, you will be able to prioritize your actions and provide the most needed care first.

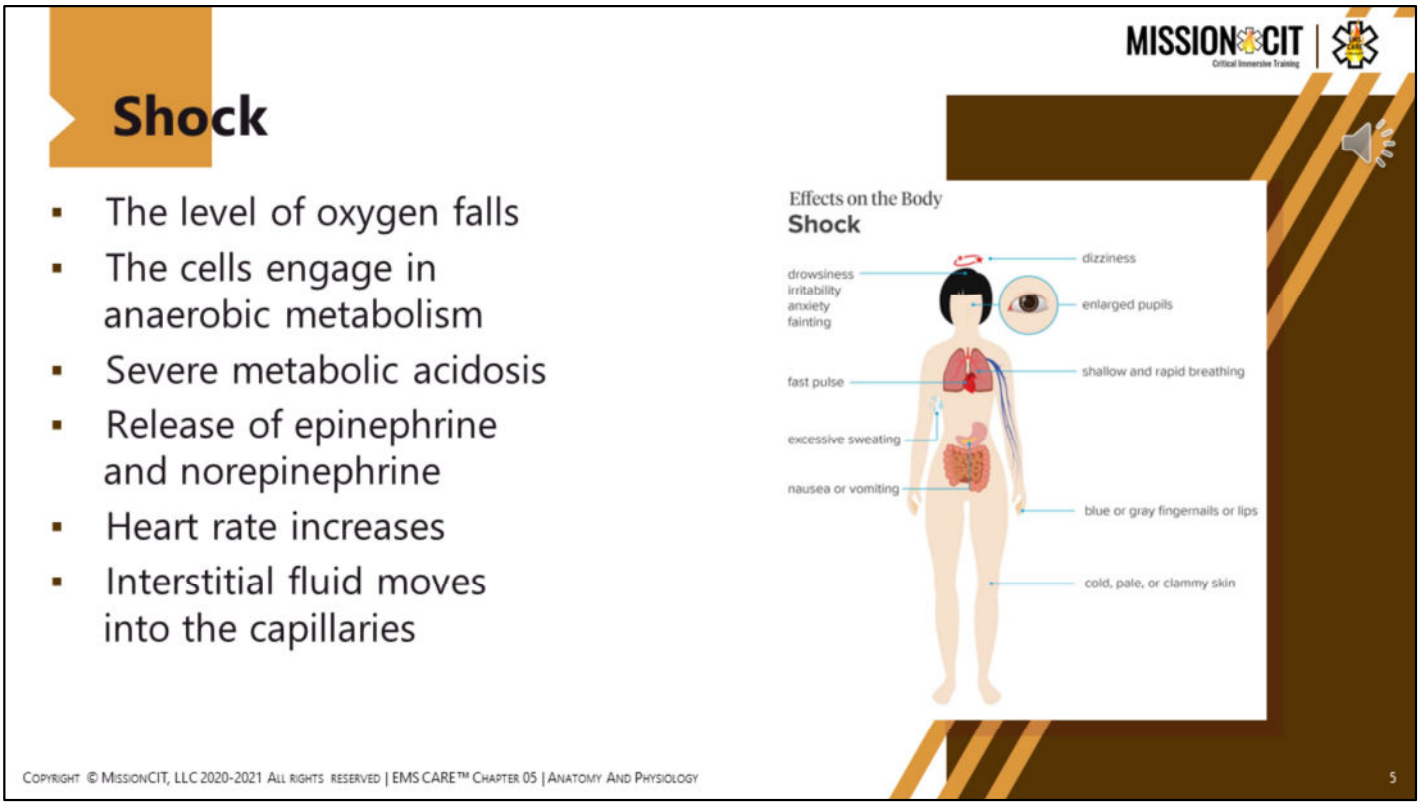


Respiratory compromise reduces the supply of oxygen to the cells and in turn, can impact their ability to survive. Two common conditions that result from respiratory compromise are hypoxia and hypercarbia. Hypoxia is a condition where cells don't get enough oxygen while hypercarbia is a condition where the carbon dioxide is not removed at the optimum levels from the cells.

Some of the factors that can lead to one or both these conditions are:

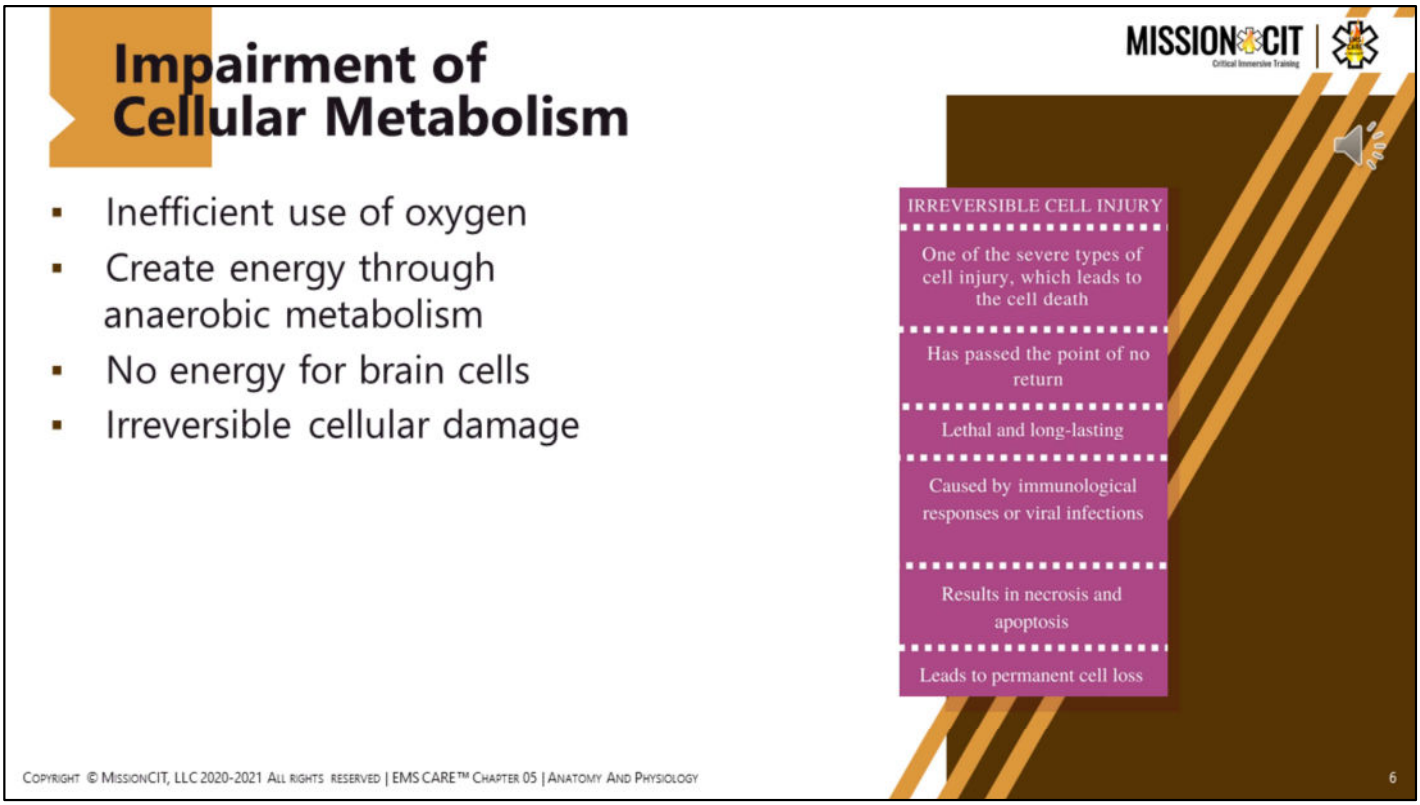
- Blocked airways
- Impairment of the muscles of breathing
- Physiological obstruction of the airway
- Change in the atmosphere
- High altitudes
- Impaired movement of the gas across the cell membrane

As a result of these factors, the oxygen levels fall, and the carbon dioxide levels increase in the blood. This leads to a rise in the respiratory rate and the blood becomes more acidic. Further, the brain sends commands to the body to breathe.



Shock occurs when the organs and tissues do not get enough oxygen. Unfortunately, it has a debilitating effect on the body that includes,

- The level of oxygen supplied to the tissues fall
- The cells engage in anaerobic metabolism
- Severe metabolic acidosis ensues
- The baroreceptors initiate the release of epinephrine and norepinephrine
- The heart rate increases
- The interstitial fluid moves into the capillaries



Impairment of cellular metabolism has a profound impact on the body as it results in the inability to efficiently use the available oxygen and glucose at the cellular level. Also, the cells create energy through anaerobic metabolism that can result in acidosis. Further, the brain cells will not be able to use this energy, and overall, the resultant cellular damage becomes irreversible.

This brings us to the end of this lesson and in the next one, Justin will take you through the chapter review.