Fat Cells and Inflammation
By Maureen Miletics, RN, BSN, MS, CBN
*Director of Bariatric Services*

The Free Dictionary by Farlex defines inflammation as “A localized protective reaction of tissue to irritation, injury, or infection, characterized by pain, redness, swelling, and sometimes loss of function.” When I hear the word inflammation I envision my ankle after I severely sprained it or my forehead after I bumped into something.

Inflammation is an amazing process. It is our body’s attempt to start healing. When you injure an ankle for instance, your body sends blood, along with other immune hormones or proteins, to that injured area. The increase in blood flow can help with the healing process by delivering oxygen and nutrients. In addition, the blood, hormones and proteins help get rid of the injured and dead tissue/cells. They act as little cleanup guys. All of this extra flow causes swelling which then prevents you from walking. This in itself is your body’s way of protecting you from causing more injury to that area by making you rest the injured area. However, sometimes the swelling process can be too excessive and cause more damage by blocking off blood supply or causing nerve damage.

So what does this have to do with obesity? Fat cells, or adipose cells, have the ability to grow as they store excess lipid. They are one of the few cell types that can reach larger diameters. Fat cells are designed to be protectors against too much nutrients in the body. They can take on excess nutrients because of their ability to grow. Other cell-types cannot handle excess nutrients so the fat cells are protecting those cells. In obesity the fat cells are flooded with more nutrients than even they can handle. Their swelled size can cut off oxygen supply and this causes the cell to die.

Remember what happens when you have debris and dead cells from above? Parts of the blood containing immune hormones/proteins come in to get rid of that dead material causing inflammation. The overwhelmed fat cells start to overflow, spilling out material that causes more inflammation. This wide and constant inflammation affects all the organs in the body causing many of the diseases affected by obesity: cancers, heart disease, vascular disease, diabetes and many, many more.
Not only does the excess weight put stress and strain on all parts of the body, the excess size of the fat cells damages your body through problems at the cellular level.

O’Rourke, Robert, MD.(2012). Inflammation, obesity, and the promise of immunotherapy for metabolic disease, SOARD, article in press.