Emphysema causes the lungs to lose their elasticity which means affected individuals can inhale air but cannot exhale all of the inhaled air causing an increase in residual volume or dead space. This causes individuals suffering emphysema to have difficulty breathing, usually because they suffer from shortness of breath (myVMC 2015). When being diagnosed for emphysema, doctors look for barrel chested adults who tend to hunch over while sitting (myVMC). Hunching over helps to prevent air trapping making it easier to get air in and out (myVMC). Another easy way to tell if an individual is suffering from emphysema is if the individual purses their lips to exhale (Schiffman 2016). Although symptoms are not always present, they tend to become noticeable in the fifth decade of life after prolonged smoking (myVMC 2015). This is because emphysema is considered a slow disease, it takes time for the shortness of breath to become noticeable (Schiffman 2016). People suffering from severe emphysema can become short of breath just from getting ready for work (myVMC 2015). Emphysema can also have symptoms such as fatigue, headaches, coughing up blood or mucous, and reoccurring respiratory infections (Disability research center). Individuals with emphysema are also at a higher risk for other illnesses such as pneumonia, heart failure, or irregular heart beat (Disability Research Center). Although emphysema is irreversible, quitting smoking, eliminating the inhalation of polluted air- such as fireplaces, and avoiding cold air can help decrease symptoms which makes breathing easier (Disability research center). The most important thing an individual diagnosed with emphysema can do is quit smoking. Quitting smoking will slow down the progression of the disease and increase the survival time for that individual (myVMC 2015).

A recent study done on smoke-exposed mice showed that after only six weeks of smoking the mice bodyweight dropped by 26% and their exercise capability was impaired by 15% (Bowen 2017). Their diaphragm was also impaired and the smoking caused problems with the right ventricle (Bowen). Surprisingly, the study did not show a decrease in mitochondrial function or a decrease in limb muscular function, meaning smoking does not affect either (Bowen). Though there in no known cure for emphysema, symptoms can be treated with the use of an inhaler (Disability research center) and surgical procedures.

Surgeries, specifically lung volume reduction surgeries, significantly improve lung function (Sciurba 2016). One such procedure is placing a 10-15 cm wire into the lungs. This wire will regain its shape once placed into the lungs and will compress emphysematous tissue allowing the restoration of elasticity (Sciurba). The placement of endobronchial coils, and endobronchial valves, are limited to patients with heterogeneous emphysema and patients without interlobar collateral channels (Sciurba). Interlobar collateral ventilation is when new pathways are formed outside the existing airways to make breathing easier and are found in many individuals with emphysema. The difference between heterogeneous and homogeneous emphysema is that heterogeneous only affects a specific area while homogenous usually affects the entirety of the lung. Patients that have homogeneous emphysema, while sometimes can still have the surgery, will not experience as improved lung function (Sciurba). These affected individuals have very limited treatment options that actually work (Sciurba). Patients with endobronchial coils implanted have short term improvements in their six minute walking distance of up to a 20% increase than those patients without coils (Sciurba). Implanting the endobronchial coils also has improved long term effects (Hartman 2014). Patients who attended voluntary follow up appointments received chest x-rays proving that the coils had not migrated up to three years after implantation (Hartman). Individuals with emphysema were tested up to three years after their surgeries and there was still significant improvements in the six minute walk test and the St. George’s Respiratory Questionnaire, which tests the quality of life (Hartman). However, this only stood for about 50% of the individuals with the surgery; the other half showed a gradual decrease in improvements (Hartman). Endobronchial valves have the same improvements as endobronchial coils with minor differences. The valves can also only be placed in individuals without interlobar collateral ventilation (Klooster 2014). The valve, a one way valve, led to improvements in the forced expiratory volume in one second (Klooster). Surgeries given to patients with a complete fissure are more effective than those given to patients with an incomplete fissure (Klooster). Though surgery is a way to improve life for affected individuals, exercise will also help. The study involving the mice proved that the mice who endured smoking for six weeks but also ran on the treadmill for the same period of time were able to increase heart functions (Bowen 2017). This means high intensity exercise is able to reduce, or even reverse, problems caused from smoking (Bowen). Emphysema itself cannot be cured but exercise, surgeries, and antibiotics can decrease symptoms and make living easier.