Pulmonary embolism
What is a pulmonary embolism?

Pulmonary embolism occurs when a blood clot travels from elsewhere in the body, such as the legs, to the right side of the heart, and then to the arteries that supply the lungs. Clots may not only cause decreased blood flow to the lungs, but can also put strain on the right side of the heart. In more serious cases, this strain on the right side reduces the amount of blood that the left side of the heart can pump to the rest of the body, causing dangerously low blood pressure. Symptoms of a pulmonary embolism can be obvious, such as chest pain; however, even shortness of breath can indicate an embolism.

There are three types of pulmonary embolisms as defined by the American Heart Association:

1. Low-risk
2. Sub-massive: Occurs without low blood pressure, but causes either right heart dysfunction or damage to the heart muscle.

Massive: Occurs with low blood pressure for more than 15 minutes, or requiring medicines to keep blood pressure elevated to a normal level.

Treatment
Interventional radiologists are able to use minimally invasive techniques to help treat pulmonary embolisms. These approaches require less risk, less pain, and less recovery time than traditional surgery.

Systemic anticoagulation
This treatment is used to prevent a new clot from forming. It is often the only treatment for those with a low-risk pulmonary embolism.

Catheter-directed thrombolysis
This technique restores blood flow to the lungs and reduces the strain on the right side of the heart. A small cut is made either on the neck or the thigh to access a vein. X-rays are then used to guide a series of small catheters and wires to the heart and to the right and left pulmonary arteries. Catheters are left in the pulmonary arteries next to the clots, and release a protein to dissolve the clot for a period of 12 to 24 hours.

Mechanical thrombectomy
In patients who cannot receive catheter-directed thrombolysis, interventional radiologists can remove the clot using mechanical thrombectomy. Using the same method as in catheter-directed thrombolysis, a suction device is placed into the pulmonary artery as close to the clot as possible and high-power suction is used to remove the clot.