Cancer of the esophagus affects nearly 500 thousand people every year and is the 6th most common cause of cancer-related death in the world. In Poland, over 1,000 men and almost 300 women are diagnosed with this disease every year. A common symptom of esophageal cancer is difficulty to swallow food. Unfortunately, this symptom usually occurs at an advanced stage of the disease and on average only 20% of patients will live for five years with this condition. However, if the disease is found at its early stages, the survival increases over three-fold. This difference highlights the importance of early detection.

Esophageal cancer develops from normal cells of the esophagus that lose their normal features. Initially, the normal lining of the esophagus changes to abnormal structures called low-grade and high-grade intraepithelial neoplasia. These conditions have a high chance of developing further into esophageal cancer. Both types can be detected by doctors using a camera in a procedure called endoscopy. Unfortunately, these early precancerous changes are subtle in appearance and are often difficult to recognize during this examination.

The Cytosponge™ is a new, minimally-invasive device that collects cells from esophagus. It is a capsule, containing a 3 cm sponge, attached to a string. When the patient swallows the capsule, it dissolves in the stomach to release the sponge. When retrieved, the device collects esophageal cells that can be used in clinical diagnosis. So far, the Cytosponge™ has been shown to be an excellent tool for diagnosis of patients with gastroesophageal reflux disease (GERD, also known as acid reflux or heartburn). The ability of the Cytosponge™ to detect GERD comes from the fact that we have found a very precise naturally occurring molecule (called biomarker) that is specific to GERD-related changes.

Our study, brought by the Centre of Postgraduate Medical Education and National Institute of Oncology both in Warsaw, aims to improve the survival of patients with esophageal cancer by increasing doctors' potential to detect this disease at its early steps in development. So far, the scientific knowledge about this cancer is scarce and the discovery of biomarkers that are specific to this condition bring several difficulties. To tackle those issues, we've split our study into two parts. In the first part, we will study historical tissue samples from patients who already underwent treatment for early neoplasia and esophageal cancer. Together with our colleagues at the University of Cambridge, we will carry out laboratory analysis of these samples to find biomarkers that accurately distinguish the neoplastic tissue from normal cells of esophagus.

In the second part, we intend to recruit patients with high-risk of developing esophageal cancer to independently test the biomarker found in the first part. The biomarker will be evaluated on samples collected using the Cytosponge™ and compared with the reference standard-of-care procedure, which is endoscopy.

Taken together, the present study aims to expand our knowledge on the development of esophageal cancer. We then aim to use this knowledge to establish new diagnostic tests, that will work with the Cytosponge™ device. We hope that this new test will be used in the future for early and accurate diagnosis of patients at risk of developing esophageal cancer, to extend the patient survival worldwide.