Abstract- This paper will discuss how gastrointestinal fluoroscopy can be used to try and detect gastrointestinal diseases and abnormalities.

I. Introduction
Gastrointestinal fluoroscopy is a method of medical imaging used to detect possible abnormalities and diseases of the gastrointestinal series which includes the esophagus, stomach, and duodenum. Indications of possible gastrointestinal complications are abdominal swelling and pain, bloating, nausea, vomiting, and trouble swallowing. Any combination of these symptoms can warrant a gastrointestinal fluoroscopy which can be performed as a minimally invasive precautionary detection procedure.

II. Methods
The first fluoroscopy machines involved a direct imaging system that produced an image on a screen for the operator to analyze. There were many problems with early fluoroscopy machines such as the large amount of radiation exposure to both the patient and operator, images could not be recorded on the closed system, and low image quality.

Today, gastrointestinal fluoroscopy is an extremely low risk and minimally invasive procedure in which a patient swallows a barium drink which reflects the x-ray to a screen to produce an image. As the patient swallows the drink, a radiologist has the ability to see in real time video the gastrointestinal series at work, looking for the possible source of the problem.

III. Limitations
One of the largest limitations to the fluoroscopy field is the overall exposure to radiation a patient can receive without dangerous side effects. Because of this, the medical imaging field is moving towards a variable pulse fluoroscopy system. This varied x-ray pulse can reduce the patients’ total exposure to radiation by up 90%. However the cost of these safer, varied pulse systems can exceed $500,000 to be produced, making them a rarity in most facilities.

IV. Future
Recent improvements to the fluoroscopy field have been primarily focused on the reduction of total exposure to potentially dangerous radiation emitted by the x-ray beam. Current fluoroscopy machines are designed with collimators, which are adjusted to restrict the area on which the x-rays are needed. Another more recent development to the device is added metal disks that filter out lower energy x-ray beams which are still have radiation, but are no use to the production of a fluoroscopic image.

The image quality has also been improved significantly by modern advancements in the digital video field which are carried over into the medical imaging field of fluoroscopy. Fluoroscopy machines are also currently equipped with specially designed anti-scatter grids. These grids are placed between the patient and image receptor to diminish the scattered photons that may impinge the image.

References: