

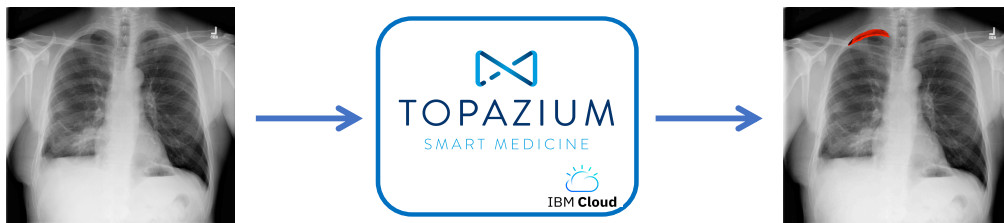


### **Pneumothorax Diagnostician (“PD”)**

**What’s new:** Engineered on the basis of deep neural networks, Topazium implemented a platform which unsupervisedly examines patient’s chest X-rays, detecting and localizing the potential presence of pneumothorax. Our system is capable of surpassing the diagnostic performance observed on primary-care centers, allowing prioritization of highlighted images for urgent follow-on review by specialized physicians.

**Key insights:** PD takes patient’s chest X-rays as input and returns the potential pneumothorax localization, if/when suspected to be evident.

**How it works:** Chest X-ray images belonging to patients with a suspected pneumothorax clinical condition are uploaded into Topazium’s platform. This input is encoded and processed by a calibrated convolutional neural network. The method uses texture analysis based on intensity and gradient for image segmentation to identify the pneumothorax-likely regions.



**Results:** PD is able to detect the vast majority of images with evidential pneumothorax, whilst correctly categorizing images those deemed as “negative”. Preliminary testings show a Dice Similarity Coefficient around 86%.

**Why it matters:** Pneumothorax can precipitate life-threatening emergencies due to lung collapsing and, respiratory and/or circulatory distress. Topazium’s framework performs an emergency triage for priority interpretation and/or provides a further validation of diagnosis suggested by non-radiologist professionals. This results in faster treatment times, significantly reducing therapeutic traumas and fatalities.