I will discuss a machine learning problem in physiological measurement related to the detection of episodes of esophago-pharyngeal acid regurgitation using an ambulatory monitoring method called 24-hour pH monitoring. Acid regurgitation into the pharynx can result in direct contact of gastric acid with structures of the upper airway: the subsequent damage to airway tissue may underpin a variety of 'unexplained' airway disorders. Reliable and optimal detection of episodes of acid regurgitation is thus an important clinical goal. An initial foray using Fisher's linear discriminant function suggested that ML approaches could improve signal detection compared to traditional ad-hoc criteria, but subsequent optimisation was hampered by the apparent overlap between the candidate and artefact signal groups and a large degree of class imbalance (>90% episodes are not physiologically plausible for being candidate episodes of regurgitation). I subsequently searched for appropriate solutions for this problem and will briefly review some of the relevant literature relating to the class-imbalance problem. Finally, I would like to discuss the application of operating characteristics other than routinely encountered ROC-based measures.