

Laryngopharyngeal Reflux (LPR)

By Daniel T. Layish, MD



Gastroesophageal reflux that advances all the way to the airway or pharynx is commonly known as laryngopharyngeal reflux (LPR). LPR has been implicated as a factor in asthma, chronic cough, recurrent laryngitis, and sleep disordered breathing. However, other entities such as vocal abuse, allergic rhinitis, sleep disordered breathing can be difficult, if not impossible to differentiate from LPR. Empiric therapy with proton pump inhibitors (PPIs) has been the previously accepted approach to the workup of such patients. However, such an empiric course of therapy can result in a significant expense, as well as potential for side effects.

Objective testing with the Restech Dx-pH Measurement System is an alternative to empiric PPI therapy for LPR diagnosis. This system measures and records airway pH levels twice per second for up to 48 hours. A pH sensor rests at the distal end of a thin (4.6 Fr) catheter that is placed trans-nasally into the patient's oropharynx. A light emitting diode on the tip of the catheter is used to confirm the placement of the sensor just lateral to the uvula by visualizing it through the patient's open mouth.

The Restech Dx-pH Probe is easily inserted in the office setting and remains in place without compromising the patient's ability to eat, talk, sleep, or perform other normal tasks. By pressing designated buttons on the device, patients can easily input clinically relevant information such as meals, symptoms, and body position. This information is helpful for later analysis and discussion of the patient's behaviors and their reflux patterns. Additionally, the Restech Dx-pH Probe study can be integrated into sleep studies, which can be helpful in the evaluation of unexplained sleep disturbances.

24-hour pH monitoring has been used in the diagnosis and management of gastroesophageal reflux (GERD) for several decades. As the atypical manifestations of reflux became more widely recognized and attributed to LPR, the need for a corresponding technology to measure LPR grew as well. In response, Restech developed an innovative new version of this standard pH technology, using a miniaturized sensor that is capable of measuring the pH of the aerosolized particles of refluxate that reach a patient's upper airway.

Because the laryngeal epithelium lacks certain defenses comparable to those in the esophageal epithelium, it is much more susceptible to damage from reflux – even from less acidic reflux. Because of this, it is important that the data from a 24-hour pH study is interpreted and analyzed using a method that takes into account the sensitive nature of the laryngopharyngeal anatomy. Although

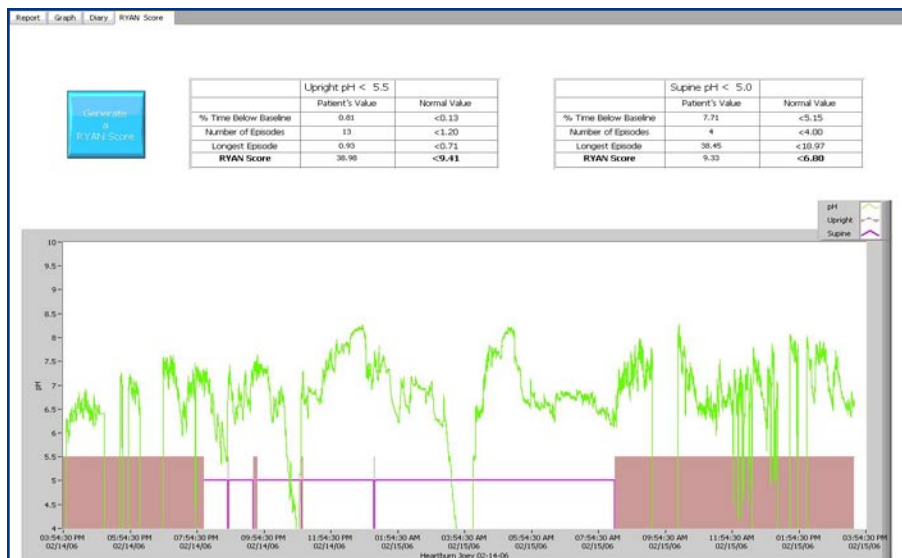
a pH of 4 has been used traditionally (and appropriately) for assessment of gastroesophageal reflux exposure, it is widely agreed that a higher pH threshold is appropriate for the oropharynx.

Thoracic surgeons Dr. Tom DeMeester and Dr. Lawrence Johnson developed the first quantitative score for esophageal reflux measurement, which came to be known worldwide as the “DeMeester Score.” This score was based on calculations of time, duration and number of events that occur below the threshold of pH 4.0 (noted as the level at which pyrosis occurs and where cellular damage is inflicted on the epithelium).

When Dr. DeMeester and his team at the University of Southern California performed their clinical investigation with the Dx-pH Measurement System in normal subjects, they employed a mathematical graphic model to determine the discriminating pH thresholds for evaluation of oropharyngeal reflux exposure. These thresholds are pH 5.0 for the supine period, and pH 5.5 for the upright period. The frequency and duration of these events are used in algorithms that make up the RYAN Score, which is integrated into a software program that is used to objectively evaluate each case.

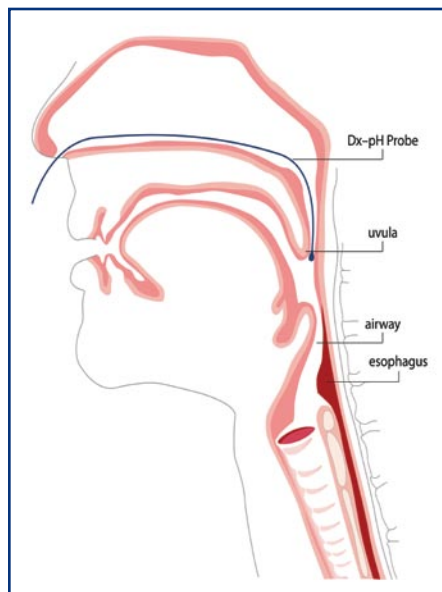
For many patients, review of their Restech pH study results with their doctor offers them a better understanding of their disease process. For example, showing a patient a severe nocturnal reflux event following a heavy, late night meal might encourage them to make better decisions about their eating habits. Hopefully, this improves their compliance with both their medical therapy and recommended lifestyle changes.

The Restech pH test is also useful in the assessment of patients whose symptoms may be inadequately controlled with proton



pump inhibitor therapy. Many patients need twice a day proton pump inhibitor therapy for adequate control of their LPR, to manage the daytime and the nighttime components of the disease. By performing the Restech Study, we can design an optimal treatment regimen for each individual patient's needs based on their unique reflux patterns.

It should be noted as well that the Restech Dx-pH Probe is able to measure alkaline pH levels as well. While it is a subject that requires further elucidation, it is clear that alkaline pH levels in the throat can be deleterious. Cases have been noted in which a patient is taking too high a dose of PPIs (likely over the counter treatments), resulting in very high pH levels in the throat. The effects of alkalinity can be strikingly similar to those of acidity in the oropharynx, and thus virtually impossible to distinguish based on endoscopic evaluation and symptom assessment alone.



The Restech pH probe is clearly not meant to eliminate the need for esophageal manometry, esophagogastroduodenoscopy, and other gastrointestinal evaluation. However, the Restech Dx-pH probe can be an important adjunct in the evaluation of patients who exhibit signs of atypical reflux. The Restech Dx-pH Measurement System has been

well validated in scientific literature by highly respected institutions throughout the United States as well as internationally. As clinicians become more aware of this new technology, I believe that it will play an increasing role in the management of patients with LPR.

Daniel Layish, MD, graduated magna cum laude from Boston University Medical School in 1990. He then completed an Internal Medicine Residency at Barnes Hospital (Washington University) in St. Louis, Missouri and a Pulmonary/Critical Care Fellowship at Duke University in Durham, North Carolina. Since 1997, he has been a member of the Central Florida Pulmonary Group in Orlando. He currently serves as Medical Director of the Intensive Care Unit, Respiratory Therapy and Pulmonary Rehab at Winter Park Memorial Hospital.

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