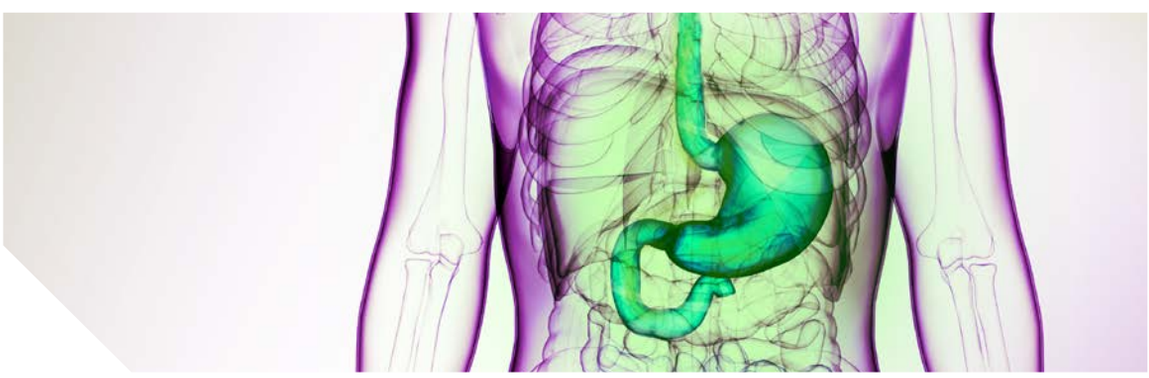
The importance of managing the pH of the oesophagus in GERD

Gastroesophageal reflux disease (GERD) is a chronic condition where stomach contents reflux into the oesophagus, typically due to lower oesophageal sphincter dysfunction. It affects about 10–20% of people in Western countries, with around 6% having severe forms, while prevalence in Asia is lower, around 5%. It presents with heartburn, regurgitation and sometimes atypical symptoms like chronic cough or asthma, significantly impairing quality of life.[1]



The modern definition of actionable GERD requires conclusive evidence of reflux-related pathology on endoscopy and/or abnormal reflux monitoring in the presence of compatible troublesome symptoms. However, not all 'troublesome' symptoms can be directly linked to reflux of gastric content, and symptoms alone are insufficient for a conclusive diagnosis. Nevertheless, empiric antisecretory therapy is appropriate when typical symptoms improve with GERD treatment, but up-front oesophageal testing is suggested for all other symptom categories and in proton pump inhibitor (PPI) non-responders, prior to invasive GERD management or prior to long-term medical management.[2]

A lower oesophageal pH maintained for a prolonged period can exacerbate GERD symptoms and cause mucosal damage. Therefore, controlling pH is essential to reduce acid exposure, prevent complications, and improve quality of life.[3]

pH monitoring to guide GERD diagnosis and management

The updated Lyon Consensus 2.02 highlights oesophageal pH monitoring as essential for diagnosing and managing GERD. The most relevant measure in ambulatory reflux monitoring is the percentage of time the distal oesophagus has a pH <4, known as acid exposure time (AET). An AET <4% is considered normal, while values > 6% are classified as abnormal.[2,4,5] Values between 4-6% requires additional clinical context and data.

Depending on whether GERD has been previously confirmed, different approaches are considered:

- In patients without prior objective evidence of GERD, ambulatory pH monitoring off PPI therapy, using catheter-based or wireless systems, is recommended to accurately establish or rule out abnormal acid exposure.[6]

- In patients with confirmed GERD and persistent symptoms despite treatment, pH-impedance monitoring on optimized therapy is advised to detect ongoing acid or weakly acidic/non-acid reflux and guide management.[2]

Additionally, the consensus encourages individualized testing strategies, including prolonged monitoring and impedance metrics, to improve diagnostic accuracy and tailor therapy.[2]

Technological advances continue to improve diagnostic accuracy, patient comfort and clinical relevance. Methods such as multichannel intraluminal impedance-pH (MII-pH)[3,6] and wireless capsule-based systems,[3,7] expand reflux detection beyond conventional pH-metry, allowing more personalized assessment. Selecting the appropriate method depends on the patient's symptoms, treatment response and tolerance, supporting more tailored management.[3,6]

pH testing before anti-reflux surgery

Prior to anti-reflux surgery, 24-hour oesophageal pH monitoring confirms pathological acid reflux, ensuring only appropriate candidates undergo surgery and avoiding unnecessary procedures. By establishing the degree of acid exposure and related parameters, pH monitoring distinguishes GERD from other conditions with similar symptoms, which would not benefit from surgery.

Moreover, the test also predicts mucosal damage severity, guides decisions about surgical technique, and supports perioperative planning. Overall, preoperative pH monitoring ensures surgery benefits only suitable patients, minimising risks of persistent symptoms or postoperative complications.[8]

pH control with PPIs

Pharmacologic management of GERD focuses on neutralising or reducing gastric acid to control oesophageal pH. This includes, among others, PPIs and acid-suppressing agents such as histamine H2-receptor antagonists (H2RAs), which remain the cornerstone of sustained pH control.[9]

The American College of Gastroenterology (ACG) Clinical Guideline9 recommends appropriate dosing and timing of these agents to optimise treatment and ensure maximal acid suppression. Given the variability in pH control among acid-suppressing therapies, switching to an alternative option may be appropriate for incomplete responders.[9]

Conclusion

Measuring and managing oesophageal pH is central to high-quality GERD care. Objective pH monitoring confirms disease, quantifies acid exposure, and tracks response, enabling tailored therapy and prevention of complications. Adjusting treatment according to pH results reduces symptoms, promotes mucosal healing, and improves quality of life.

References

1. Azer SA, Hashmi MF, Reddivari AKR. Gastroesophageal Reflux Disease (GERD) [Updated 2024 May 1]. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2025 Jan-. Available from: https://www.ncbi.nlm.nih.gov/books/NBK554462/
2. Gyawali CP, Yadlapati R, Fass R, Katzka D, Pandolfino J, Savarino E, Sifrim D, Spechler S, Zerbib F, Fox MR, Bhatia S, de Bortoli N, Cho YK, Cisternas D, Chen CL, Cock C, Hani A, Remes Troche JM, Xiao Y, Vaezi MF, Roman S. Updates to the modern diagnosis of GERD: Lyon consensus 2.0. Gut. 2024 Jan 5;73(2):361-371.
3. Tanvir F, Nijjar GS, Aulakh SK, Kaur Y, Singh S, Singh K, Singla A, Sandhu APS, Luthra S, Antaal H. Gastroesophageal Reflux Disease: New Insights and Treatment Approaches. Cureus. 2024 Aug 24;16(8):e67654.
4. Stein E, Sloan J, Sonu I, Kathpalia P, Jodorkovsky D. GERD for the nongastroenterologist: successful evaluation, management, and lifestyle-based symptom control. Ann N Y Acad Sci. 2020 Dec;1482(1):106-112.
5. Tighe MP, Andrews E, Liddicoat I, Afzal NA, Hayen A, Beattie RM. Pharmacological treatment of gastro-oesophageal reflux in children. Cochrane Database Syst Rev. 2023 Aug 22;8(8):CD008550.
6. Săraru ER, Enciu V, Peagu R, Fierbinţeanu-Braticevici C. Advances in the diagnosis of GERD. Rom J Intern Med. 2021 Mar 5;59(1):3-9.
7. Weitschies W, Müller L, Grimm M, Koziolek M. Ingestible devices for studying the gastrointestinal physiology and their application in oral biopharmaceutics. Adv Drug Deliv Rev. 2021 Sep;176:113853.
8. Alves JR. Importance of esophageal pH monitoring and manometry in indicating surgical treatment of gastroesophageal reflux disease. Rev Assoc Med Bras (1992). 2021 Jan;67(1):131-139.
9. Katz PO, Dunbar KB, Schnoll-Sussman FH, Greer KB, Yadlapati R, Spechler SJ. ACG Clinical Guideline for the Diagnosis and Management of Gastroesophageal Reflux Disease. Am J Gastroenterol. 2022 Jan 1;117(1):27-56.