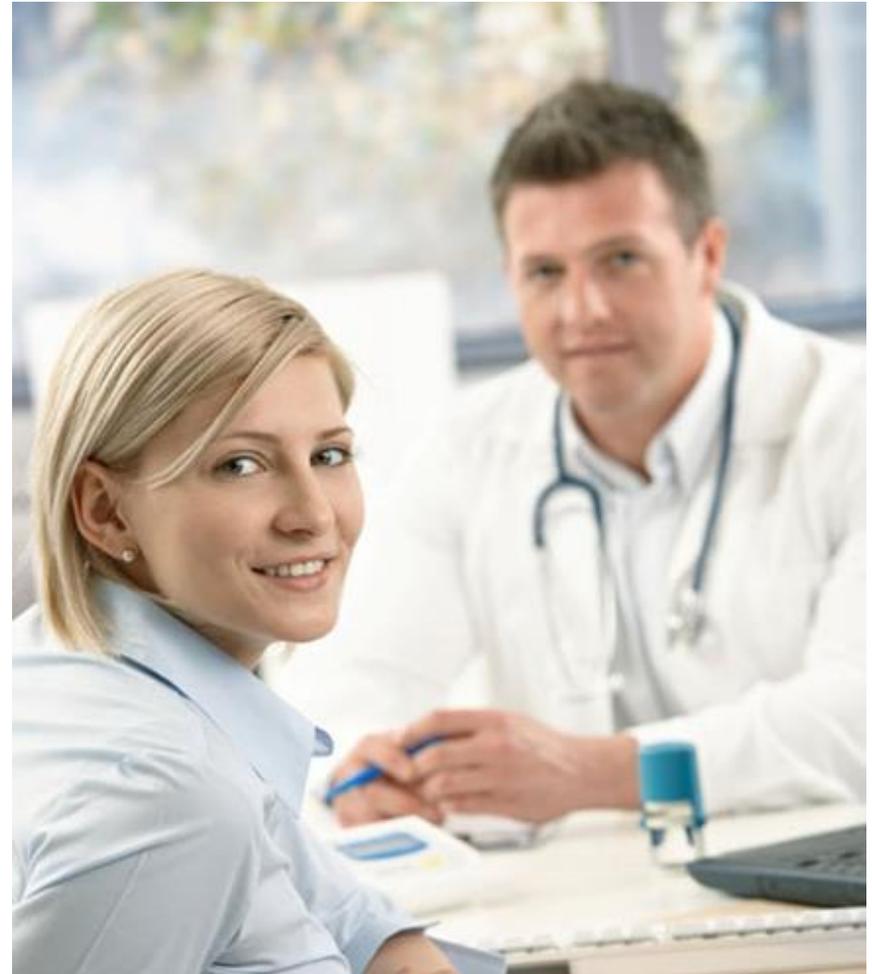


GastroPanel®-innovation from Finland



GastroPanel®-innovation – test for stomach health

- GastroPanel® is a diagnostic test based on four biomarkers (Pepsinogen I, Pepsinogen II, Gastrin-17 and *H. pylori* antibody test)
- NHI (Kela)-reimbursement with doctors prescription
- [Test request form](#)
- From blood sample (plasma)
- GastroSoft® interprets the results
www.gastropanel.com
- Based on vertical measurement- and ELISA-technologies of the company
- www.biohithealthcare.com/AboutUs/History
- <https://www.biohithealthcare.com/additional-information>
- [http://www.biohithealthcare.com/News: Safe diagnostics of Helicobacter pylori infection](http://www.biohithealthcare.com/News:Safe%20diagnostics%20of%20Helicobacter%20pylori%20infection)



Upper abdominal symptoms

Upper abdominal symptoms (dyspepsia)

- Encountered in 20-40 % of the population
- Correct diagnosis not possible on the basis of symptoms only
- Test treatment of dyspepsia by proton pump inhibitors (PPI) might masquerade the correct diagnosis and preclude the patient's access within reach of a curative treatment on time.

Dyspepsia

Dyspeptic complaints may be accompanied by

- *Helicobacter pylori* (HP)-infection (5-70 % of the population) and HP-induced or autoimmune type atrophic gastritis (over 10 % of elderly people)
- An increased risk of gastric and esophageal cancer
- In addition, malabsorption of vitamin-B12, iron, calcium, magnesium and zinc (with severe sequels)
- Malabsorption of certain medications, and particularly among elderly people, severe and even fatal infections of gastro-intestinal- and respiratory tracts

Dyspepsia

- Dyspeptic symptoms can also be of colorectal origin particularly among the elderly people
- Thus, in addition to GastroPanel, it is recommended to use the Finnish **ColonView-FIT** innovation (specific for human blood) for early detection of colorectal cancer and its precursors

www.colonview.com

www.biohithealthcare.com/additional-information

Among the patients with dyspeptic symptoms, the unique GastroPanel® – Helicobacter test discloses

- ***Helicobacter pylori* -infection**
- **Atrophic gastritis** (atrophy of the gastric mucosa and functional disorder) and its topographic location in the antrum and/or corpus
- **The status of gastric acid output**

Chronic high acid output predisposes the esophagus to reflux disease, which can be accompanied by ulcerative esophagitis, Barrett's esophagus and lower esophageal cancer



GastroPanel results indicating

- i) symptomatic *Helicobacter* infection after eradication therapy,
 - ii) atrophic gastritis, or
 - iii) symptomatic high acid output,
- all are referral indications for gastroscopy and biopsy examination

www.biohithealthcare.com/additional-information

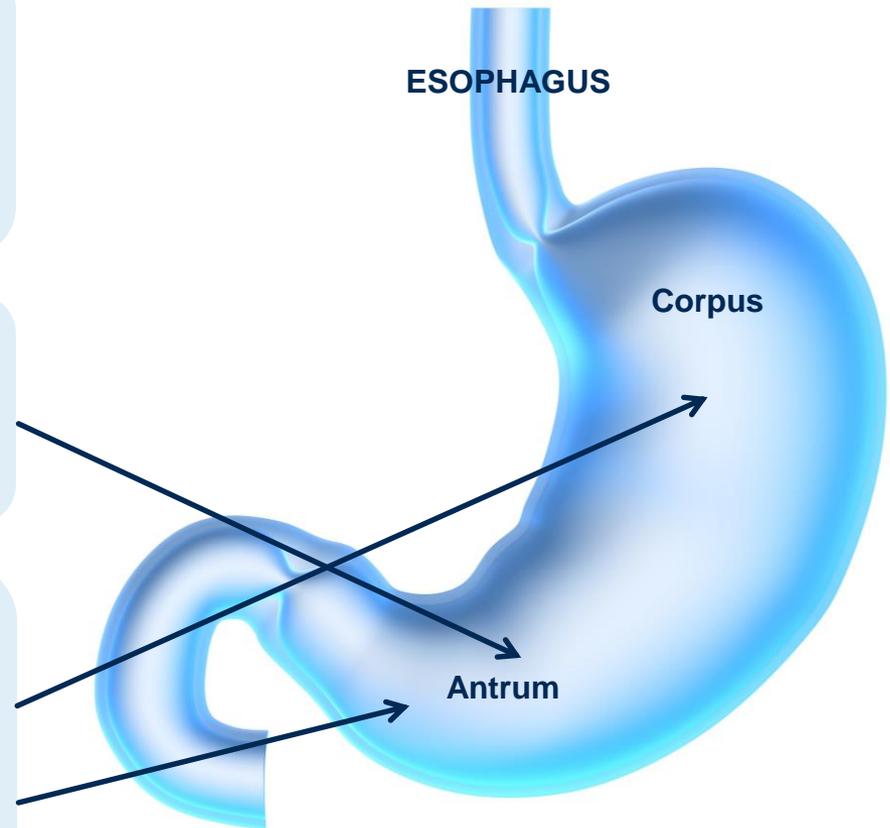
[www.biohithealthcare.com / Latest News: Safe diagnostics of *Helicobacter pylori* infection](http://www.biohithealthcare.com / Latest News: Safe diagnostics of Helicobacter pylori infection)

GastroPanel® – A panel of four biomarkers

**Pepsinogen I for corpus and
Pepsinogen II for whole
stomach**

**Gastrin-17 is biomarker for
antrum**

***H. pylori* IgG antibody levels
disclose gastric inflammation
(*H. pylori* gastritis; antrum &
corpus)**



Biomarkers

- **Pepsinogen is a precursor of pepsin**
 - Pepsinogen I level reflects the mucosal function of gastric corpus (body)
 - Pepsinogen II level reflects the mucosal function of whole stomach
- **Gastrin-17 is a peptide hormone produced by the G-cells in the gastric antrum**
 - Regulates the acid output of the corpus and reacts to any fluctuations of it
- ***Helicobacter pylori* –antibody titers disclose an ongoing *H.pylori* infection or a previous exposure to this bacteria**

- Combined with pepsinogen I and II levels, *H. pylori* –antibody test also tells whether eradication therapy was successful or not
- By interpreting the results of the four biomarkers by **GastroSoft**-application, combined with the patient's clinical information, one can obtain a more comprehensive and reliable overview on the structure and function of gastric mucosa than by estimating the single biomarkers (www.gastropanel.com)

Why is stomach health so important?

In most cases asymptomatic atrophic gastritis, AG (gastric mucosal injury and functional disorder), has two causes:

- *H. pylori* –infection can progress to atrophic gastritis if not treated
- Autoimmune type of AG
 - AG leads to hypochlorhydric or acid-free stomach that increases the risk of gastric and esophageal cancer
 - This risk can be reduced or even eliminated by **Acetium-capsules** that bind carcinogenic acetaldehyde born in acid-free stomach (www.acetium.com)
 - Autoimmune type of AG is frequently accompanied by another autoimmune disease, like celiac disease, IBD, rheumatoid arthritis, type 1 diabetes mellitus, autoimmune thyroid disease (AITD)

Compared to those with healthy stomach, AG-patients have an increased risk of gastric cancer that remains asymptomatic for long:

- AG in the corpus: 5-fold risk
- AG in the antrum: 18-fold risk
- AG in both antrum and corpus: 90-fold risk

Gastric- and esophageal cancer in Finland

- Each year, around 570 new patients contract with gastric cancer and 460 patients die of this disease
- The respective figures for esophageal cancer are 330 and 270 (mortality rate exceeding 70 %)
- *Upper Abdominal Symptoms and Reflux Disease-* Guidelines recommend PPI-test treatment as well as UBT- and SAT tests in diagnosis.
 - These recommended management practices fail to reliably diagnose *H.pylori* infection, and
 - Fail to detect atrophic gastritis, with its associated risks of gastric- and esophageal cancer and other sequels

Gastric- and esophageal cancer in Finland

- Atrophic gastritis not diagnosed on time (increases with age; over 10% prevalence in elderly people), similar as prolonged unnecessary PPI-treatment will delay the correct diagnosis that might exclude the patient within reach of a curative treatment
- Using a nationwide implementation of GastroPanel in the primary diagnosis and screening might enable avoiding even hundreds of unnecessary cancer deaths every year, as well as prevent a large number of other diseases resulting in substantial savings of the ever-increasing health care costs

<https://www.gastropanel.com/decision-makers/screening-model>

Why GastroPanel blood test?

To increase the patient safety and to save the health care costs, all patients with upper abdominal symptoms as well as asymptomatic subjects in routine monitoring, should be subjected to GastroPanel-examination as the first-line diagnostic test before gastroscopy, unless alarming symptoms appear

- Gastroscopy with biopsies is an expensive procedure, and used as the first-line examination, up to 80% are unnecessary and experienced as unpleasant by most patients
- Current best practice guidelines recommend endoscopy only when the patient already has alarming symptoms when the outlook of the therapy is poor
- GastroPanel in the first-line diagnosis and screening helps finding on time the right subjects for endoscopy, treatment and follow-up

Why GastroPanel blood test?

- GastroPanel corrects the problems of the current best practice guidelines: “*Upper Abdominal Complaints and Reflux Symptoms*” – The recommended UBT (“*breath test*”) and SAT (“*fecal test*”) fail to detect atrophic gastritis, can give false negative results of *H.pylori*-infection, and in addition, do not give any information about the status of gastric acid output
 - Without correct *H. pylori*-diagnosis and/or timely detection of atrophic gastritis, the patients can contract and even decrease (possibly hundreds per year) of gastric- and esophageal cancer or *H.pylori*-associated peptic ulcer disease
 - Atrophic gastritis is the major cause of vitamin-B12 deficiency and the consequent comorbidities, including, peripheral neuropathy, depression, dementia and Alzheimer’s disease
 - Atrophic gastritis can result in calcium deficiency with subsequent osteoporosis and bone fractures as well as iron deficiency with consequent disorders

Why GastroPanel blood test?

In parallel with aging population, B12-vitamin-, calcium- and iron deficiencies have become a major public health problem

Atrophic gastritis remaining undiagnosed by UBT- and SAT-tests, can also cause severe and even fatal infections in the respiratory and gastro-intestinal tract particularly in the elderly people



[www.biohithealthcare.com / Latest News: Safe diagnostics of *Helicobacter pylori* infection](http://www.biohithealthcare.com / Latest News: Safe diagnostics of Helicobacter pylori infection), www.gastropanel.com, <https://www.biohithealthcare.com/wp-content/uploads/2019/11/Criticism-about-current-care-recommendations.pdf>

GastroSoft – For interpretation of the results – www.gastropanel.com



Patient Data

Patient id 12345
Patient age 64
Gender Male

Eradicated No
Use of PPI Frequent
Acid symptoms No
Use of NSAIDs No

Sample data

Collection time 2019-10-01
Analysis time 2019-10-02

Laboratory analysis results

		Reference range
Pepsinogen I	25 µg/l *	30-160 µg/l
Pepsinogen II	12 µg/l	3-15 µg/l
Pepsinogen I/II	2.1 *	3-20
Gastrin 17B (fasting)	35 pmol/l *	1-7 pmol/l
<i>H.pylori</i>	85 EIU *	<30 EIU

Interpretation

The results indicate atrophic corpus gastritis (loss of gastric cells) due to a *Helicobacter pylori* infection. The stomach is hypochlorhydric or achlorhydric. Atrophic gastritis (loss of gastric cells, "no gastric acid") is a significant risk factor for gastric cancer. Hence gastroscopy is recommended. The carcinogenic acetaldehyde forming in an achlorhydric stomach is most likely the cause of gastric and oesophageal cancer. The final diagnosis can be decided after gastroscopy.

Notice! The final diagnosis shall always be made by the clinician/medical doctor.