Digestion/Absorption

Digestion encompasses the functional activities of: mastication, gastric acid production, pancreatic activity, bile production and brush border maintenance. Absorption depends on all of the above actions, as well as a healthy gut mucosal barrier.

Gut Immunology

Eosinophil Protein X (EPX) reflects IgE-mediated inflammation and tissue damage and can be elevated in celiac disease, collagenous colitis, helminthic/parasitic infection, and IgE mediated food allergies. Elevated EPX requires further diagnostic testing to determine the cause. Calprotectin is a neutrophilic marker specific for inflammation in the gastrointestinal tract. It is elevated with infection, post-infectious IBS, and NSAID enteropathy. Fecal calprotectin can be used to differentiate IBD vs. IBS, to monitor treatment in IBD, and to determine which patients should be referred for endoscopy and/or colonoscopy. Levels between 50-120 should be repeated at 4-6 weeks and confirmed.

Metabolic

Gut metabolism is representative of the bacterial milieu, primarily through the presence of commensal bacteria. Metabolic activities include: mucous production, vitamin synthesis and absorption, deconjugation of steroid hormones and bile acids, fat regulation, and SCFA metabolism. These metabolic activities require a normal population of commensal bacteria without active bacterial, viral, or parasitic infection.
Microbiology

The Markers in this section reflect the bacteriological status of the gut.

**Beneficial bacteria** Beneficial flora controls potentially pathogenic organisms, influences nutrient production, removes toxins from the gut and stimulates the intestinal immune system (GALT). The composition of the colonic flora is affected by diet, transit time, stool pH, age, microbial interactions, colonic availability of nutrients, bile acids, sulfate and the ability of the microbes to metabolize these substrates. Ideally, levels of Lactobacilli and E. coli should be 2+ or greater. Bifidobacteria being a predominate anaerobe should be recovered at levels of 4+.

**Additional bacteria**

- **Non-pathogen**: Organisms that fall under this category are those that constitute normal, commensal flora, or have not been recognized as etiological agents of disease.
- **Potential Pathogen**: Organisms that fall under this category are considered potential or opportunistic pathogens when present in heavy growth.
- **Pathogen**: The organisms that fall under this category are well-recognized pathogens in clinical literature that have a clearly recognized mechanism of pathogenicity and are considered significant regardless of the quantity that appears in culture.

**Mycology**: Organisms that fall under this category constitute part of the normal colonic flora when present in small numbers. They may, however, become potential pathogens after disruption of the mucosal lining, which enables fungi to colonize and establish a local infection.

Human microflora is influenced by environmental factors and the competitive ecosystem of the organisms in the GI tract. Pathological significance should be based upon clinical symptoms and reproducibility of bacterial recovery.

<table>
<thead>
<tr>
<th>NG</th>
<th>NP</th>
<th>PP</th>
<th>P</th>
</tr>
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<tbody>
<tr>
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<td>Non-Pathogen</td>
<td>Potential Pathogen</td>
<td>Pathogen</td>
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**Lab Comments**

Elastase repeated and confirmed. 09/29/2011 UL
**Parasitology**

Optimized Parasite Recovery (OPR) is a technique used by Genova Diagnostics Inc. that involves combining multiple stool specimens submitted from the same patient for intestinal parasite examination as compared to individual sample evaluation. Research demonstrates that this method increases parasite recovery.

Data from analysis shows that parasites are detected in 22% of samples submitted to Genova Diagnostics Inc. This implies that a significant portion of the population suffers from infection with parasites, many of whom experience minimal gastrointestinal symptoms.

### Microscopic Exam Results:

- No Ova or Parasites seen
- White Blood Cells: Rare

### PARASITOLOGY EIA TESTS:

<table>
<thead>
<tr>
<th>Test</th>
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<th>Out of Range</th>
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<tbody>
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</tr>
<tr>
<td>Giardia lamblia</td>
<td>Negative</td>
<td></td>
</tr>
<tr>
<td>Entamoeba histolytica/dispar</td>
<td>Negative</td>
<td></td>
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