The Auscultatory Percussion of the Stomach Plays a Central Role in Bedside Diagnosis and Primary Prevention of Neurodegenerative Diseases and their Inherited Real Risks

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Dr S. Caramel, Mathematician
Dr. M. Marchionni, MD, Neurosurgeon

International Society of Quantum Biophysical Semeiotics, Italy
This talk is about:

1. ... a new bedside diagnostic technique which is called Biophysical Semeiotics ... 

2. ... and how, in our preliminary experience, Biophysical Semeiotics allows early diagnosis and timely treatment of patients affected by heart and brain disorders
The clinical data which will be presented during this Meeting have been collected as case series observational study by:

Dr Sergio Stagnaro, MD, Consultant in Gastroenterology and Internal Medicine

and

Dr Mario Siniscalchi, MD, PhD, Consultant Cardiologist
Up to now,

Biophysical Semeiotics is

“Evidence Based Medicine“ Level IV

However we believe that the data gained from our preliminary experience have the potential of attracting physicians and scientists who may be interested in bringing their own experience, skills and competence in order to validate (or falsify) our preliminary results.
In addition to that:

1. the economical cost of Biophysical Semeiotics *is minimal* therefore *NO EXTRA COSTS* are to be added

2. the length of time required to the trained physician in order to correctly apply Biophysical Semeiotics is very short, therefore this novel technique can be safely implemented even by the busy clinicians during their daily clinical duties.
What is Biophysical Semeiotics?

• It is an extension of classical, bedside, medical semeiotics based on the use of the stethoscope.

• It stems from the integration of non linear mathematical models and chaos theory with biological systems.

• It allows physicians to detect and recognize specific body signals, in order to assess the normal or abnormal functions of different organs and systems, therefore allowing early diagnosis and timely treatment.
The foundation of Biophysical Semeiotics is the **simultaneous** application of two pillars of classical medical semeiotics:

1. Auscultation
2. Percussion
Auscultatory Percussion

During Auscultatory Percussion, striking a surface which covers an air-filled structure (e.g. normal lung, stomach) will produce a resonant note while repeating the same test over a fluid or tissue filled cavity generates a relatively dull sound.
During classical, bedside examination of the patient, the Auscultatory Percussion allows the physician to collect two different kind information:

Topographical Anatomy

Pathology
• In medical literature, different authors have highlighted

• the *usefulness of auscultatory percussion*

• in order to detect and make bedside diagnosis of a number of disorders such as:

• pleural effusion, neoplastic chest disorders, heart diseases, obstructive uropathy, misdiagnosed fractures or subdural and extradural haematomas.
Auscultatory percussion of the head

JOHN R GUARINO

Abstract

Eighty-nine consecutive patients with suspected intracranial masses were examined by auscultatory percussion in a blind study to assess the sensitivity of the procedure. Each patient underwent computed tomography (CT) of the brain as part of his medical care, and the results were compared with those of auscultatory percussion. Fifty-one of the patients had abnormal CT scans, of whom 44 (86%) had abnormal (positive) findings on auscultatory percussion; seven (13%) yielded false-negative results. Each of the patients with subdural haematomas had distinctly positive findings by auscultatory percussion. Of the 38 patients with normal CT scans, 11 had strokes with hemiparesis, and each had positive findings in the contralateral hemisphere by auscultatory percussion. The remaining 27 patients with normal CT scans were healthy; 25 had normal findings on auscultatory percussion, two (7%) gave false-positive results. Twenty subjects were studied with phonoscopy.

Auscultatory percussion is easy to perform and is
Chest percussion in health and disease

A full description of the acoustic characteristics of chest percussion assessed by subjective means is available in excellent textbooks [23, 24], and will not be attempted here. However, a clinically relevant aspect
Rapid Clinical Diagnosis of Pulmonary Abnormalities in HIV-Seropositive Patients by Auscultatory Percussion*

Roscoe S. Nelson, M.D.; Leland S. Rickman, M.D.; W. Christopher Mathews, M.D.; Stephen C. Beeson, M.D.; and Steven C. Fullerton, M.P.H.

A prospective, blinded study of pulmonary findings in hospitalized patients with HIV infection compared auscultatory percussion (AusP) with conventional percussion (ConP) and conventional auscultation (ConA) using chest radiographs as the gold standard. Sixty-three patients had chest radiographs and were examined by one to three examiners. Seventy of the 126 lungs had radiographic abnormalities (55.6 percent). Auscultatory percussion proved to be the most sensitive of all techniques for each examiner (range, 51.0 to 69.6 percent) for detecting radiographic abnormalities and also had higher likelihood ratios for two of the three examiners; AusP also had the highest likelihood ratio pooled across examiners. Of the 166 abnormal results of lung examinations, the combination of AusP and ConA detected 31 more abnormalities than ConP and ConA combined, with 14 of these being diagnosed with Pneumocystis carinii pneumonia. No abnormalities were detected by ConP that were not detected by AusP. These findings suggest that AusP, a rapid clinical maneuver, is more sensitive and specific than ConA and ConP in determining pulmonary abnormalities in HIV-infected inpatients.  

(Chest 1994 105: 402-07)

AusP = auscultatory percussion; Bil = bilateral; ConA = conventional auscultation; ConP = conventional percussion; Infil = infiltrate; LE = lung examination; LL = lower lobe; ML = middle lobe; PCP = Pneumocystis carinii pneumonia; ROC = receiver operator characteristic; SS = silver stain; UL = upper lobe
Use of Percussion as a Screening Tool in the Diagnosis of Occult Hip Fractures

Mohan Tiru, S H Goh, B Y Low

ABSTRACT

Traumatic hip pain is a common clinical problem in the emergency department. There is significant morbidity in discharging a patient with an undiagnosed undisplaced hip fracture. The auscultatory percussion technique is a useful method to risk stratify patients who present with traumatic hip pain and with normal radiographs. We sought to study the sensitivity and specificity of the auscultatory percussion technique in a prospective study.
Auscultatory percussion: an added dimension in physical diagnosis.

Brunk SF.

Source Cancer Treatment Centers of America, Southwestern Regional Medical Center, Tulsa, Oklahoma 74137, USA.

Abstract

The combination of both auscultation and percussion in the diagnostic examination improves both auscultation and percussion, and, in so doing, increases the skill of palpation. Auscultatory percussion (AP) is easy to learn, easy to use and requires little time to perform. The size of normal organs and the size of abnormal masses as determined by AP are usually similar to measurements determined by X-rays and CT scans. Abnormalities found by AP need to be evaluated and confirmed by other diagnostic procedures. AP brings increased precision to physical diagnosis and is felt to be a valuable addition to medical practice.
Identification of the Greater Curvature of the Stomach using Auscultatory Percussion

**Essential requisites:**

1) Patient must be in a supine position
2) Patient must be collaborative
The stethoscope is placed on the skin projection area of the stomach:
on the xipho umbilical line:

2-3 cm below the ensiform process of the sternum, 1-2 cm to the left:
The patient is asked to support the stethoscope with a light touch, so as to ensure complete adhesion of the stethoscope to the skin:

The percussion is then performed with the middle finger, bent as a hammer, directly, smoothly and gently on the skin. The percussions must be very light, with the equal force you would apply when playing with a 1 week old-baby beating on his/her forehead.
The arrow marks the direction to be followed during finger-percussion: from lateral towards the umbilicus.

All the points of the green line must be assessed ie you have to maintain a spatial continuity in your percussion (no more than 0.5 - 1 cm between one dot and the other one!)
When the percussion beats "directly" on the skin projection of the stomach the sound of percussion is perceived clearly modified: stronger, more clear, intense, and hyperfonetic: then on the point in which the sound changes a black dot is drawn.
The procedure is repeated until at least five points in which the sound changes are visually identified on the skin surface.

All the points are then connected with a line, therefore obtaining the skin projection of the greater curvature of the stomach.
The previous steps are the basic steps for the Auscultatory Percussion of the greater curvature of the stomach and their underlying principle and technique can also be applied in order to identify the skin projections of other organs (heart, lungs) or to bedside assess pathological conditions (pleural effusion, dilated cardiomyopathy).

Therefore, in classical medical semeiotics, Auscultatory Percussion is a static technique useful for clinical anatomy and medical diagnosis.
The intuition of Dr Sergio Stagnaro, MD (Consultant in Gastroenterology and Internal Medicine) was that,
during Auscultatory Percussion,
the greater curvature of the stomach
does move (dilatation and/or contraction)
and does show highly precise reflex patterns
which can be appreciated and defined in terms of
duration (seconds)
and intensity (cm)

when a pressure stimulus is applied on the skin
projection of a different organ (for example, the heart, or the brain).
Following the application of the pressure stimulus to the skin projection of an organ (heart, brain) during the Auscultatory Percussion of the greater curvature of the Stomach, a dynamic relationship between two different biological systems (Heart-Stomach, or Brain-Stomach) is created:

the Auscultatory Percussion is not anymore a static technique but a dynamic one and has been defined by Dr Stagnaro “Reflex Diagnostic Auscultatory Percussion”.
1. ... once the greater curvature of the stomach is identified ...

2. ... the physician with one hand performs the percussion just immediately before the skin projection of the stomach ...

3. ... and at the very same time, with the other hand, is applying the pressure stimulus on the skin projection of the organ to be assessed ( heart in this example )
The Auscultatory Percussion *just immediately before* the skin projection of the stomach is essential in order to verify:

- **IF**
- **WHEN**
- **FOR HOW LONG**
- and **HOW MUCH**

the stomach dilates or contracts as a consequence of the interaction between the stomach and the organ to be evaluated (the heart in this example).
All the data presented come from a case series observational study run by Dr S Stagnaro, MD, Consultant in Gastroenterology and Internal Medicine

When: between 1982 and 2012

Where: in a single - Consultant run private practice
Inclusion criteria

1. Patients presenting for the first time with aspecific cardiological or neurological symptoms.

2. Negative objective findings during the clinical examination

3. Negative laboratory / radiological investigations related to cardiological or neurological disorders
Exclusion criteria:

1. Patients with an already established or diagnosed brain or heart disorder

2. Patients presenting with positive objective cardiological or neurological signs

3. Positive laboratory / radiological investigations related to cardiological or neurological disorders
A total of 177 consecutive patients were enrolled between 1982 and 2012.

All patients meeting the inclusion criteria underwent, in time, assessment of the brain/stomach or heart/stomach reflexes until, after referral to the local Cardiological or Neurological Hospital Department, an established diagnosis was achieved.

When an established diagnosis was achieved, the brain/stomach or heart/stomach reflexes were followed up in time (mean follow up 6 years).
PATIENTS PRESENTING WITH ASPECIFIC NEUROLOGICAL SYMPTOMS, N = 77
Age range: 45 - 75 years-old

ESTABLISHED DIAGNOSIS AFTER REFERRAL
PATIENTS PRESENTING WITH ASPECIFIC CARDIOLOGICAL SYMPTOMS, N = 100
Age range: 25 - 70 years-old

Established diagnosis after referral:

- MIOCARD. INF.: 31
- CORONARY S.: 29
- ANGINA: 13
- ATRIAL FIBRILL: 12
- VALVULAR DISEASES: 15

Established diagnosis after referral.
Outcome measures:

(1) to establish the variations over time (mean follow up 6 years) of the spatial/temporal parameters of the gastric reflexes.

(2) to assess whether the observed numerical values can be correlated with the progression of a cardiological or neurological disorder from the pre-clinical to a clinical stage.
In the cardiological group of patients (N = 100), which auscultatory gastric reflex patterns are observed after the application of a pressure stimulus over the skin projection of the heart?
After the application of an intense pressure stimulus over the skin projection of the heart the following LATENCY TIMES are observed:

<table>
<thead>
<tr>
<th>Condition</th>
<th>Latency Time (sec)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Health</td>
<td>16</td>
</tr>
<tr>
<td>Aspecific Sympt.</td>
<td>0</td>
</tr>
<tr>
<td>Overt Heart Disease</td>
<td>0</td>
</tr>
</tbody>
</table>
After the application of an **intense pressure stimulus** over the skin projection of the heart the following **DILATATION** values are observed:

<table>
<thead>
<tr>
<th></th>
<th>Dilatation (cm)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Health</strong></td>
<td>0, &lt;0.5</td>
</tr>
<tr>
<td><strong>Aspecific Sympt.</strong></td>
<td>&gt;0.5, &lt;1.0</td>
</tr>
<tr>
<td><strong>Overt Heart Disease</strong></td>
<td>&gt;1.0, 4.0</td>
</tr>
</tbody>
</table>
Summary of patterns in TIME (sec) and SPACE (cm) following the application of an intense pressure stimulus over the skin projection of the heart.
How can we further assess the patients presenting with aspecific symptoms?

1. The intensity of the pressure stimulus will be reduced, from high to medium-low

2. The Heart Gastric Reflex is repeated
After the application of a medium-low pressure stimulus over the skin projection of the heart the following LATENCY TIMES are observed:

<table>
<thead>
<tr>
<th>Condition</th>
<th>LATENCY (sec)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Normal</td>
<td>8</td>
</tr>
<tr>
<td>Aspecific Symptoms</td>
<td>&lt; 8</td>
</tr>
<tr>
<td>Early Stage Heart Disease</td>
<td>&gt; 7, &lt; 8</td>
</tr>
<tr>
<td>Overt Heart Pathology</td>
<td>&lt; 7</td>
</tr>
</tbody>
</table>
After the application of an medium-low pressure stimulus over the skin projection of the heart the following DURATION times are observed:

<table>
<thead>
<tr>
<th>Condition</th>
<th>DURATION sec</th>
</tr>
</thead>
<tbody>
<tr>
<td>Normal</td>
<td>&gt; 3, &lt; 4</td>
</tr>
<tr>
<td>Aspecific Symptoms</td>
<td>&gt; 4, &lt; 6</td>
</tr>
<tr>
<td>Early Stage Heart Disease</td>
<td>&gt; 6, &lt; 7</td>
</tr>
<tr>
<td>Overt Heart pathology</td>
<td>&gt; 7, &lt; 12</td>
</tr>
</tbody>
</table>

![Graph showing duration times](image)
After the application of an *medium-low pressure stimulus* over the skin projection of the heart the following DILATATION values are observed:

<table>
<thead>
<tr>
<th>Condition</th>
<th>STOMACH DILATATION cm</th>
</tr>
</thead>
<tbody>
<tr>
<td>Normal</td>
<td>&gt; 0.5 &lt;2</td>
</tr>
<tr>
<td>Aspecific Symptoms</td>
<td>&gt; 2 &lt; 5</td>
</tr>
<tr>
<td>Early Stage Heart Disease</td>
<td>&gt; 5 &lt; 6</td>
</tr>
<tr>
<td>Overt Heart Pathology</td>
<td>&gt; 6 &lt; 7</td>
</tr>
</tbody>
</table>
After the application of an medium-low pressure stimulus over the skin projection of the heart the following CONTRACTION values are observed:

<table>
<thead>
<tr>
<th></th>
<th>STOMACH CONTRACTION, cm</th>
</tr>
</thead>
<tbody>
<tr>
<td>Normal</td>
<td>0</td>
</tr>
<tr>
<td>Aspecific Symptoms</td>
<td>0</td>
</tr>
<tr>
<td>Early Stage Heart Disease</td>
<td>&gt; 0.5 &lt; 1</td>
</tr>
<tr>
<td>Overt Heart Pathology</td>
<td>&gt; 1.0</td>
</tr>
</tbody>
</table>

![Graph showing CONTRACTION min and max values]
In the neurological group of patients (N = 77), which auscultatory gastric reflex patterns are observed after the application of a pressure stimulus over the scalp?
After the application of an intense pressure stimulus over the vertex of the cranium the following LATENCY times are observed:

<table>
<thead>
<tr>
<th>Condition</th>
<th>LATENCY (sec)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Normal</td>
<td>16</td>
</tr>
<tr>
<td>Aspecific Symptoms</td>
<td>0</td>
</tr>
<tr>
<td>early stage disease</td>
<td>0</td>
</tr>
<tr>
<td>overt brain pathology</td>
<td>0</td>
</tr>
</tbody>
</table>

![Graph showing LATENCY values for different conditions](image)
After the application of an intense pressure stimulus over the vertex of the cranium, the following duration times are observed:

<table>
<thead>
<tr>
<th>Condition</th>
<th>DURATION (sec)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Normal</td>
<td>&gt; 3, &lt; 4</td>
</tr>
<tr>
<td>Aspecific Symptoms</td>
<td>&lt; 4 - 4</td>
</tr>
<tr>
<td>early stage dis</td>
<td>&gt;4, &lt;5</td>
</tr>
<tr>
<td>overt brain pathology</td>
<td>&gt;6, 10</td>
</tr>
</tbody>
</table>

![Graph showing duration times](image)
After the application of an intense pressure stimulus over the vertex of the cranium the following DILATATION values are observed:

<table>
<thead>
<tr>
<th></th>
<th>DILATATION cm</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Normal</strong></td>
<td>0 - 0.5</td>
</tr>
<tr>
<td><strong>Aspecific Symptoms</strong></td>
<td>0.5 - 1</td>
</tr>
<tr>
<td><strong>early stage disease</strong></td>
<td>1 - 1.5</td>
</tr>
<tr>
<td><strong>overt brain pathology</strong></td>
<td>1.5 - 4</td>
</tr>
</tbody>
</table>

![Graph showing DIL min and DIL max values for different stages of disease]

![Diagram of the cranial vertex with an arrow indicating pressure stimulus]
After the application of an intense pressure stimulus over the vertex of the cranium the following DURATION times are observed:

<table>
<thead>
<tr>
<th>Condition</th>
<th>CONTRACTION cm</th>
</tr>
</thead>
<tbody>
<tr>
<td>Normal</td>
<td>0</td>
</tr>
<tr>
<td>Aspecific Symptoms</td>
<td>0</td>
</tr>
<tr>
<td>early stage disease</td>
<td>0 - 0.5</td>
</tr>
<tr>
<td>overt brain pathology</td>
<td>1 - 1.5</td>
</tr>
</tbody>
</table>

![Graph showing CONTRACTION min and CONTRACTION max for different conditions](image)
How to further assess the patients with aspecific symptoms / early stage of disease?

The Brain Gastric Reflex is repeated:

1. the intensity of the pressure stimulus will be reduced, from high to medium-low

2. the exact localization (“trigger points”) of the stimulus on the scalp will be different according to the specific disorder to be evaluated.
When a medium-low pressure stimulus is applied on the frontal, prefrontal and temporal areas, the following parameters are observed in the patients with aspecific symptoms or at an early stage of Alzheimer Disease:

<table>
<thead>
<tr>
<th>LATENCY, sec</th>
<th>DURATION, sec</th>
<th>STOMACH DILATATION, cm</th>
</tr>
</thead>
<tbody>
<tr>
<td>less than 8</td>
<td>&gt; 4</td>
<td>&gt; 1 cm</td>
</tr>
</tbody>
</table>
When a medium-low pressure stimulus is applied on the frontal, prefrontal and temporal areas, the following parameters are observed in the patients with aspecific symptoms or at an early stage of Parkinson’s Disease:

<table>
<thead>
<tr>
<th>LATENCY, sec</th>
<th>DURATION, sec</th>
<th>STOMACH DILATATION, cm</th>
</tr>
</thead>
<tbody>
<tr>
<td>less than 8</td>
<td>&gt; 4</td>
<td>&gt; 1 cm</td>
</tr>
</tbody>
</table>
When a medium-low pressure stimulus is applied on the frontal, prefrontal and temporal areas, the following parameters are observed in the patients with aspecific symptoms or at an early stage of Multiple Sclerosis.

<table>
<thead>
<tr>
<th>LATENCY, sec</th>
<th>DURATION, sec</th>
<th>STOMACH DILATATION, cm</th>
</tr>
</thead>
<tbody>
<tr>
<td>less than 8</td>
<td>&gt; 4</td>
<td>&gt; 1 cm</td>
</tr>
</tbody>
</table>
When a medium-low pressure stimulus is applied on the posterior parietal area, the following parameters are observed in the patients with aspecific symptoms or at an early stage of Lateral Amyotrophic Sclerosis:

<table>
<thead>
<tr>
<th>LATENCY, sec</th>
<th>DURATION, sec</th>
<th>STOMACH DILATATION, cm</th>
</tr>
</thead>
<tbody>
<tr>
<td>less than 8</td>
<td>&gt; 4</td>
<td>&gt; 1 cm</td>
</tr>
<tr>
<td>LATENCY (sec)</td>
<td>DURATION (sec)</td>
<td>STOMACH DILATATION (cm)</td>
</tr>
<tr>
<td>--------------</td>
<td>----------------</td>
<td>-------------------------</td>
</tr>
<tr>
<td>less than 8</td>
<td>&gt; 4 sec</td>
<td>&gt; 1 cm</td>
</tr>
</tbody>
</table>
Biophysical Semeiotics is NEVER intended as substitute for the standard, clinical examination technique or an accurate and meticulous clinical history taking.

In our preliminary experience, the observed numerical values of the spatial and temporal parameters of the heart - gastric and brain - gastric reflexes:

1. are characterized by highly specific and recurrent patterns

2. can be correlated with the progression of a cardiological or neurological disorder, from the aspecific symptoms stage (preclinical stage) to the clinical stage (when a clinical diagnosis has been established)
“Traditional” prevention strategies: to treat all the population ==> very high costs, possible risks and complications

“Future” prevention strategy: made and tailored on the single patient.

We might speculate that the heart - stomach and brain - stomach gastric reflexes will allow the physicians to achieve:

1. an early diagnosis
2. a timely treatment
3. a better evaluation of pharmacological treatments
4. and the primary prevention of neurological and cardiac disorders
Thank you
Preliminary Results from our Cardiology Team

CLINICAL CASE 1
65 years old male

Present Complaint: 9 months history of sudden onset episodes of chest pain during physical efforts, worsening over the past few weeks

Investigations:
• ECG: Non-specific abnormalities
• Blood and myocardial Enzymes: NEGATIVE
• Myocardial scintigraphy NEGATIVE
• Echo stress cardiography NEGATIVE
• Holter ECG 24 hrs: NEGATIVE
Heart-Stomach Reflex (medium-low pressure stimulus)

Latency: < 8

Contraction: 3 cm
Coronary Angiography: 
Severe trivascular coronary artery stenosis
CLINICAL CASE 2
67 years old male, smoker (30 cigarettes / day)

Present Complaint: detection of systolic murmur by his GP during routine clinical assessment

Past Medical History: Arterial hypertension, dyslipidemia

DM decompensated (9% glycosylated hemoglobin)

The patient is asymptomatic for angina-palpitations or shortness of breath and does not complain of any functional limitation
JULY 2010

ECG: non specific abnormalities

Echocardiogram: Mild Left Ventricular Hypertrophy. Mitral and tricuspid insufficiency, Very mild hypokinesia of the latero-apical wall

Myocardial scintigraphy: Negative for ischemia.

Patient at high cardiovascular risk (> 30% at 10 years)
The patient is still asymptomatic for angina-palpitations or shortness of breath and does not complain of any functional limitation.

The patient is on hypoglycaemic therapy, ASA, anti-hypertensive drugs, statins.

Diabetes: improved compensation (7.2% glycosylated hemoglobin)
Blood pressure is under well controlled

The patient is still smoking 30 cigarettes / day
Latency < 8 sec
Heart-MEDIUM PRESSURE STIMULUS ==> gastric patterns

Duration > 4
Present Complaint: 3 days history of sudden onset epigastric pain and persistent fatigue.

ECG: evidence of myocardial infarction

Cardiac Angiography: evidence of obstructive pathology.
Latency < 5 sec

Duration > 8
Preliminary Conclusions from our Cardiology Team
Heart-MEDIUM PRESSURE STIMULUS ==> gastric patterns

Nearly the totality of patients with Angiographic Coronary evidence of obstructive coronary disease showed worsening of the Latency and Duration parameters of the Heart-Stomach Reflex (medium-low pressure stimulus)
Heart-Stomach Reflex (medium-low pressure stimulus)

From our series of patients, emerged preliminary evidence that Biophysical Semeiotics has been able to identify those symptomatic patients who underwent investigations the results of which was negative (“false negative“).

Biophysical Semeiotics has been useful in correctly identifying a pathological condition when other conventional investigations were negative.