



International Research Group for  
applied  
Preventive Medicine

-gap

Internationale  
Gesellschaft für  
angewandte  
Präventionsmedizin  
e.V.



➤ Associate Prof. Public Health St.  
Elisabeth University Bratislava (EU)

➤ President I-GAP

➤ Medical director of clinics in Germany,  
Austria and Switzerland

➤ Immunologist & specialist in nutritional  
medicine

➤ Co Editor and associate editor of 7  
scientific journals

Asso. Prof. Dr.Dr habil. Claus Muss PhD.



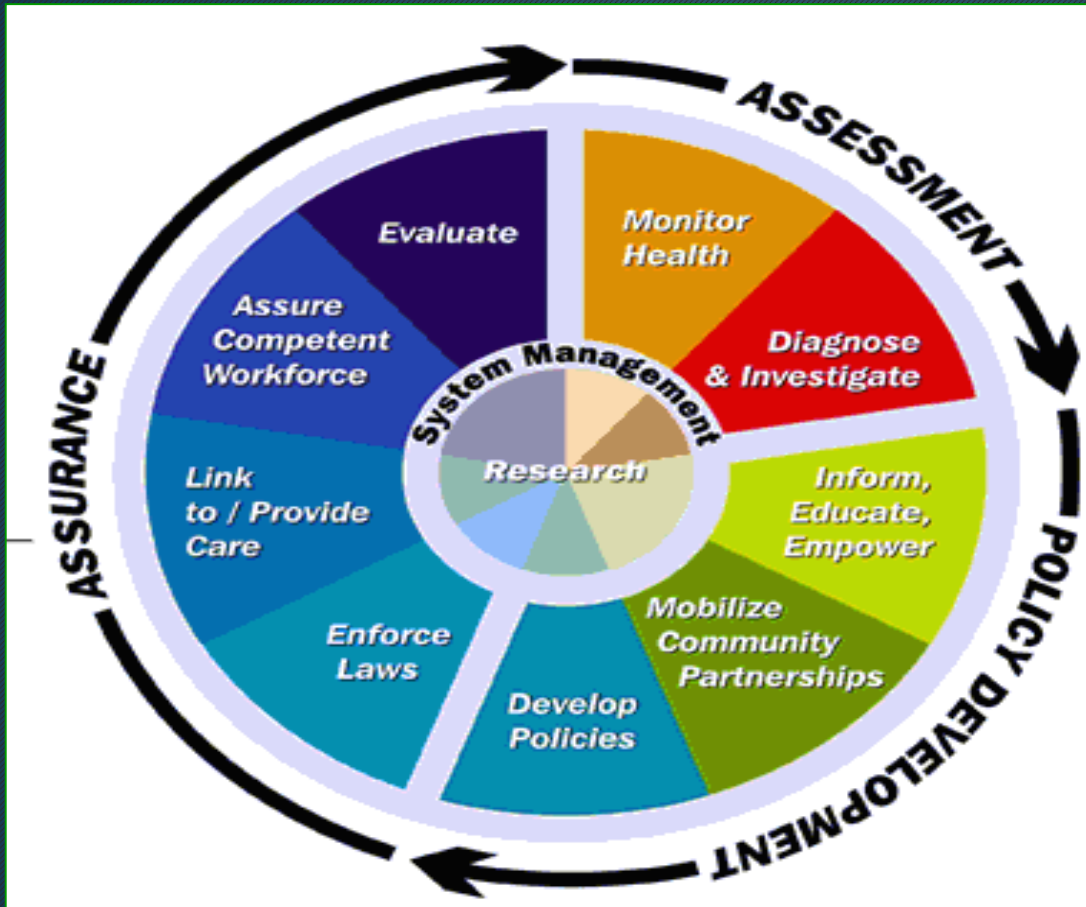
# Main clinical and research activity of Prof. Muss

- Public Health and Preventive Medicine
- To establish valid clinical biomarkers for the use in clinical medicine
- To validate such lab parameters in clinical research for general clinical application as risk biomarkers
- To apply such sensitive hallmarks in clinical trials for the evaluation of new integrative concepts in Preventive Medicine



# Priorities in Public Health & Preventive Medicine

- ✓ Monitor health status to identify and solve community health problems.
- ✓ Diagnose and investigate health problems and health hazards in the community.
- ✓ Inform, educate and empower officials and clinicians about health issues.



# Obligations of Public Health

# Driving research questions

## Driving research question(s)

- What is the impact of chronic disease in terms of burden of disease and economic costs (health expenditure and loss of productivity),
- what is done to “better” manage CD (in the broad sense, i.e. including prevention, new provider qualifications and settings, DMPs),
- what are the health and economic effects of this, and
- what has to be done to change it to the better (incl. financial incentives, IT, etc.)?

# Preventive Medicine urgently in demand

Public  
Health &  
Preventive  
Medicine

- Noncommunicable disease such as Diabetes melitus and neurodegenerative disease are constantly increasing in our society
- Society is cconstantly aging in next decdes
- Prospects are that the pure treatment of symptoms related to such chronin non communicable diseases will cause a severs financial and economic burden in future to our society



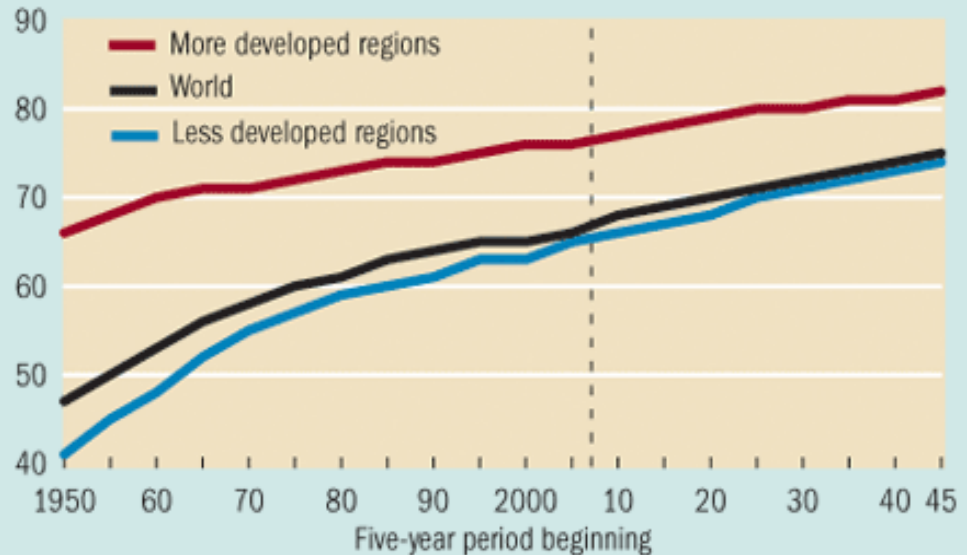
# Aging Society Worldwide

Chart 2

## Living longer

Life expectancy is continuing to rise, but there are big differences between rates in well-off and poorer countries.

(life expectancy in years)



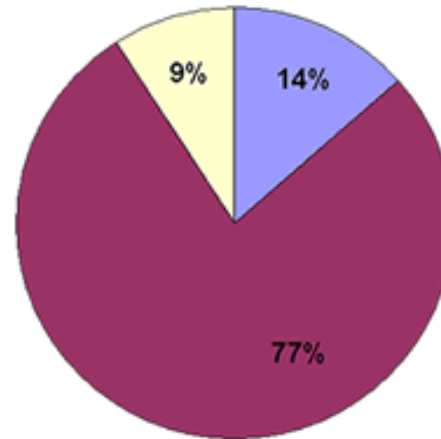
Source: United Nations, *World Population Prospects*, 2004.



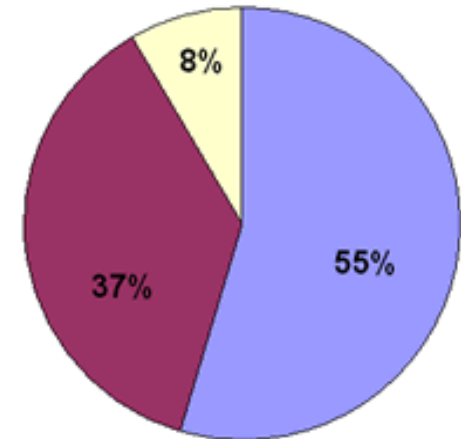
# Death caused by NCD's in industrial countries

## Deaths by Broad Cause Group

Developed Regions



Developing Regions



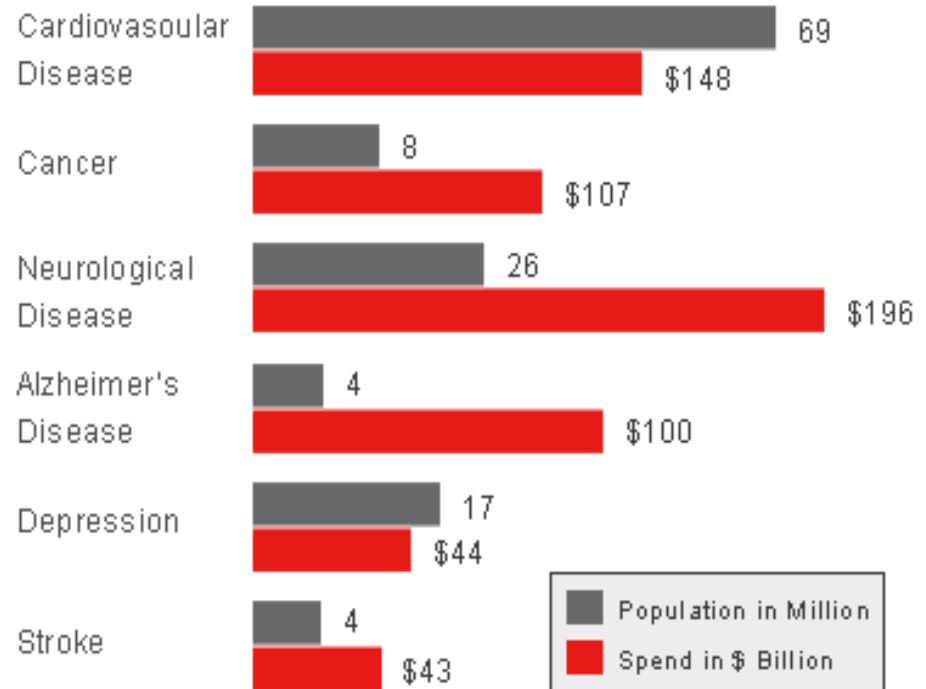
■ Communicable diseases ■ Noncommunicable conditions ■ Injuries

## 2.2 Epidemiology and burden of chronic disease in Europe – predictions

- Predictions for specific conditions vary: e.g., WHO (2006) has projected fewer deaths and DALYs from **stroke** for both sexes and all ages by 2030. In contrast, Carandang et al. (2006) have estimated more strokes and a greater burden of disease.
- Deaths directly attributable to **diabetes** are predicted to rise from about 152,000 in 2005 to more than 203,000 in 2030 (WHO 2006) as a result of rising obesity levels, especially among children.
- Deaths from **COPD** are expected to rise by about 25%, from 270,000 in 2005 to more than 338,000 in 2030 – but the burden of COPD is projected to fall from about 3.44 to 2.95 million DALYs (WHO 2006).
- **Almost certain:** The number of persons with **dementia** will increase from 7.7 million in 2001 to 10.8 million in 2020. Without effective prevention and treatment, it is expected to double to 15.9 million in 2040.

# Financial burden of aging society in Public Health

## Prevalence and Economic Cost of Major diseases - US



↑ Disease Population  
125 Million



↑ Economic Spend  
\$600 Billion

Source: Pharmaceutical Research and Manufacturers of America, 2000

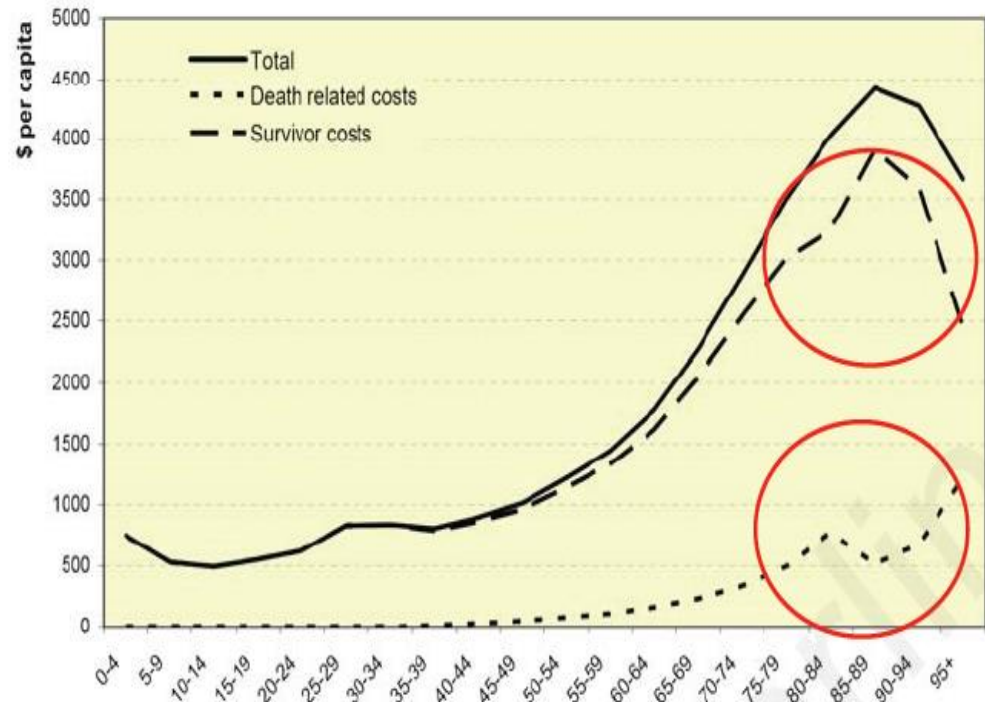
# Chronic disease in the focus of Public Health

## Managing chronic disease (CD) –

**the “ongoing management of conditions over a period of years or decades”,**  
which goes beyond CVD/cerebrovascular disease, diabetes and asthma/COPD to include cancer and HIV/AIDS (as survival rates and times have visibly improved), mental disorders (depression, schizophrenia, dementia/ Alzheimer’s...) as well as certain disabilities (sight impairment, arthroses ...) – **is potentially the greatest health care challenge.**

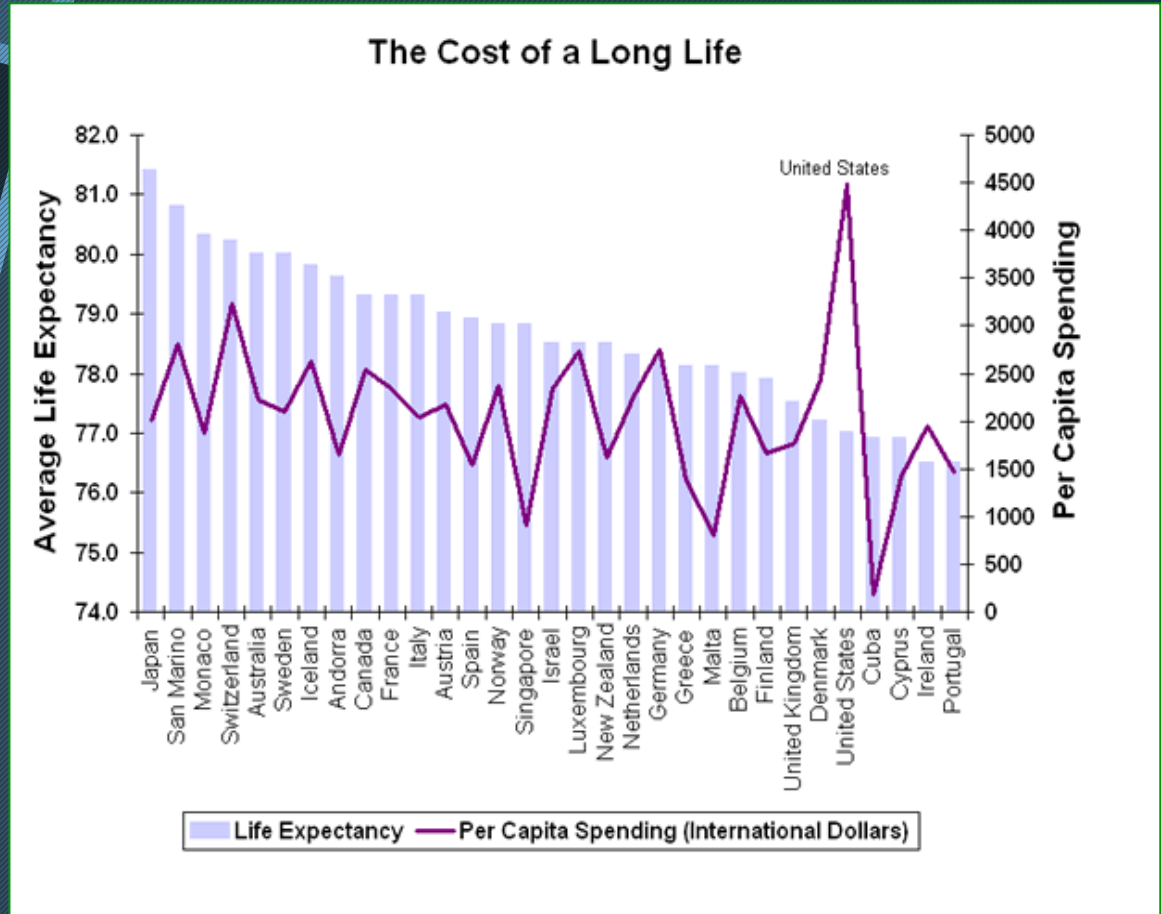
# Financial economic burden of health care

## Breakdown of the health care cost curve Expenditure per capita in each age group



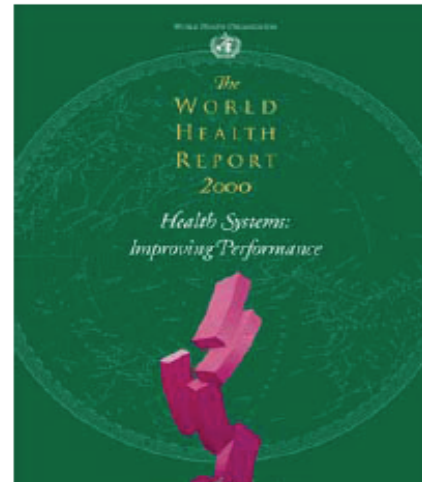
Source : OECD. Projection OECD Health and long-term care expenditures: What are the main drivers?  
OECD Economics Department Working Paper, 2006 (ENPRI-AGIR and Secretariat calculations).

# Cost of health care



## Quality and cost-effectiveness

- Germany always knew that its health care system was expensive, but was sure it was worth it (“the best system“)
- Quality assurance was introduced early but concentrated on structure
- Increasing doubts since late 1990s: Health Technology Assessment introduced since 1997
- World Health Report 2000: Germany only # 25 in terms of performance (efficiency)
- International comparative studies demonstrate only average quality (especially low for chronically ill)



# Pillars of Preventive Medicine



Nutrition



Live  
Style



Sports &  
Physical  
activity

Preventive Medicine



I-GAP closes the gap between lacking evidence in science and modern integrative clinical work

*the*  
I-GAP

science



practical applications

# Who is I-GAP?

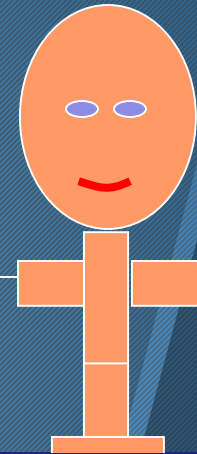
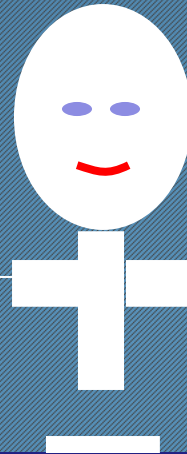
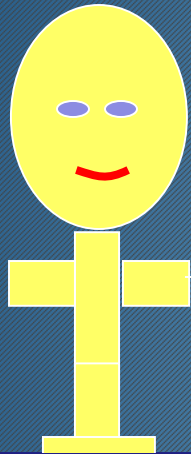
## International Cooperation

Worldwide cooperation of physicians, researchers in different scientific fields, nutritionist, pharmacologist and food industry are networking together to establish more clinical evidence for integrative treatment and Preventive Medicine

**Non-commercial**



# Cooperative Partners



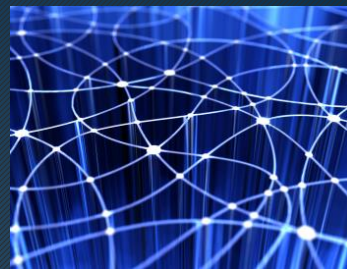
**Networking**

**Clinicians**

**Researches**

**Industry**

# Associates of I-GAP



- Members of the “academic (health care) professions” section i.t. doctors, dentists, pharmacists, dietetics experts, educationists, and sports scientists.
- Members of the “non-academic (health care) professions” section can, for example, be therapists, physiotherapists, and dieticians.

I-GAP is associated with  
different RD departments  
of clinical labs



- Research under supervision of an international advisory board in cooperation with over 4000 clinicians and therapeutics



**Cooperation with  
Food and  
Supplement Industry**

**Clinical trials**



**Teaching &  
Education**

**Publication**

i-GAP owned  
Journal

# JOURNAL of Nursing, Social Studies, Public Health and Rehabilitation

Volume: 2  
Number: 3-4  
2011  
pp. 133-274

EDITOR-IN-CHIEF:  
Mária Valcsányi

[www.ijnr.eu](http://www.ijnr.eu)

## Editorial

Peter G. Fisher, Frankfurt

## Annals

Peter G. Fisher, Frankfurt, U.S.A.

## Reviews

EFFECT OF PRENATAL NUTRITION ON THE  
CEREBRAL DEVELOPMENT OF THE INFANT  
Zsuzsanna Dobos

PRENATAL PERIOD OF LIFE AS A MATRIX FOR  
REGULATED AND OVER-REGULATED - A CULTURAL-  
PSYCHOLOGICAL SPECULATION  
László Árkai

MORE THAN A SKEWER: A COMMON LINK  
FOR RELATIONSHIP-CENTERED MINDSET AND  
SCIENCE  
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CURABLE PROBLEMS OF THE CZECH STATE-  
CITIZENSHIP SUPPORTIVE FEMALE  
INSURANCE  
Jozsef Székely, István Székely, Péter Márton

ISSUES IN THE DEFINITION OF FEMALE  
Hans Geyrhofer

HISTORICAL DEVELOPMENT OF PROSTITUTION  
IN EUROPE AND ITS IMPACT ON THE CZECH  
REPUBLIC  
Barbara Biliak

SIGNIFICANCE OF NITRATE, AMIDE AND  
NITROGEN IN NUTRITION  
Miroslav Štefánek

## Original articles

ATTITUDE TO HEALTH EXAMINERS ON THE  
SEVERAL AGE GROUPS IN THE CZECH REPUBLIC  
Václav Hořík, Věra Vávrová, Zuzana Hladíková,  
Bohdan Jiráček

PSYCHOLOGICAL CLASSIFICATION OF PSYCHOSOCIAL DISABILITY  
AND HEALTH (QOL) BY DISABILITY AND MUSCLE  
TIGHTENING IN PHYSIOTHERAPY  
Zuzana Dobos, Mária Tóthová, Mária Kissová,  
László Békó

THE ISSUE OF BEHAVIOR OF CHILDREN  
CEREBRAL PALSY IN RELATION TO PROBLEMS OF  
HEALTHCARE IN THE CONTEXT OF TRIPLE  
PAIN SYNDROME

CELLULOSE IN THE CHILDREN PUBLIC FROM  
2004-2006  
István Farkas

MOTIVATION FOR USING HEALTH INSURANCE  
PARENTS AND CHILDREN  
Anna Knapková, Jozsef Székely

Information for contributors

## PUBLISHERS:

University of South Bohemia in České Budějovice,  
Faculty of Health and Social Studies, České Budějovice,  
International Society of Applied Gerontology, Vienna, Austria



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Your Journal \_\_\_\_\_

### **NEUROENDOCRINOLOGY LETTERS**

**Included Psychoneuroimmunology, Neuropsychopharmacology, Reproductive Medicine,  
Chronobiology and Human Ethology - ISSN 0172-780X Copyright © 2013  
Neuroendocrinology Letters**

Published by: Maghira & Maas Publications

Maghira & Maas S.a.r.l., 6C, rue Gabriel Lippmann, L-5365 Munsbach, Luxembourg



Prenatal and Prenative  
Psychology and medicine

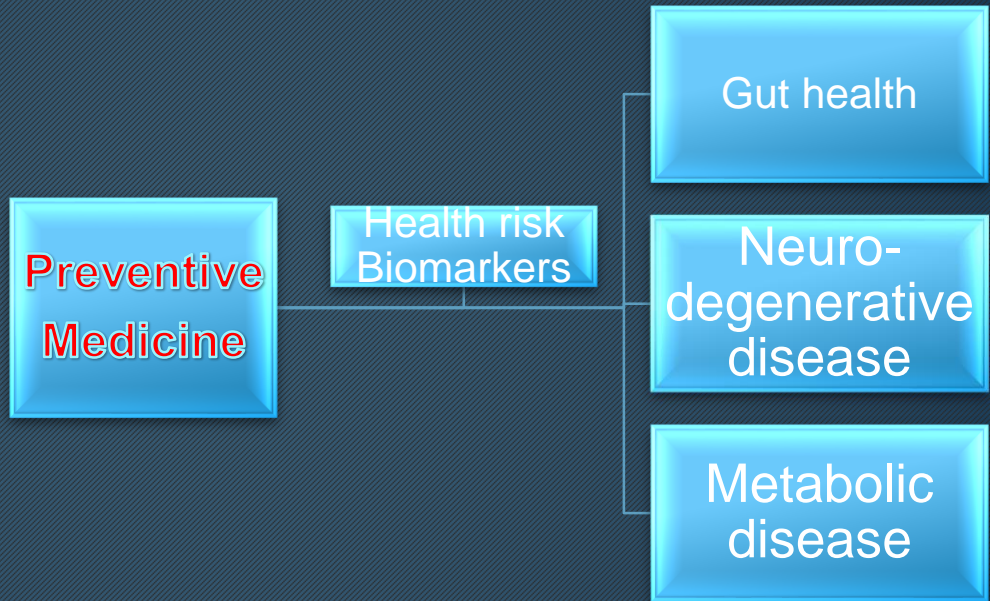


THE INTERNATIONAL JOURNAL OF  
**PRENATAL AND PERINATAL  
PSYCHOLOGY AND MEDICINE**

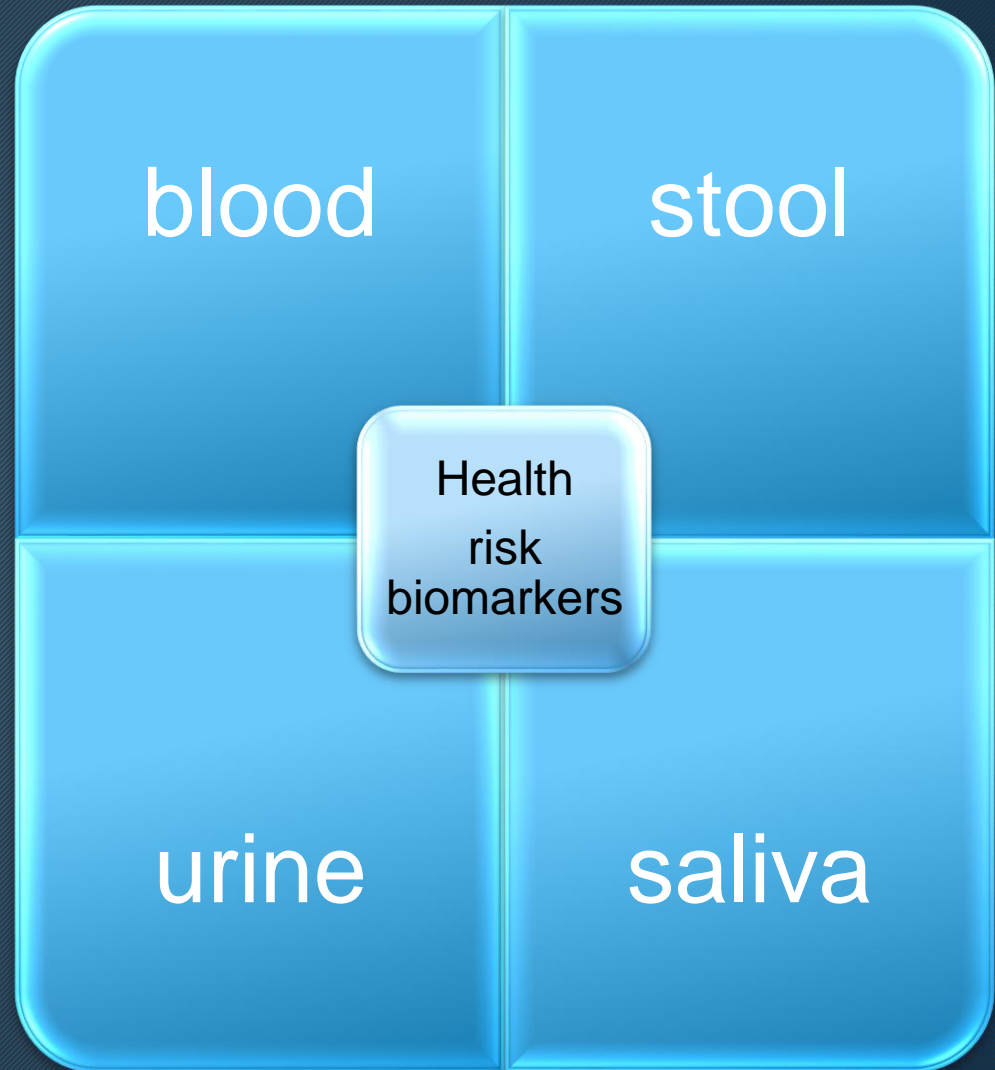
INTERNATIONALE ZEITSCHRIFT FÜR  
PRÄNATALE UND PERINATALE  
PSYCHOLOGIE UND MEDIZIN

The Official Journal of the  
International Society of Prenatal and Perinatal Psychology and Medicine

# Issues in considerations of I-GAP clinical research



*Clinical Parameters  
established in  
cooperation with RD I-  
GAP associated labs*



# Stool parameters to evaluate malabsorption and gut health

- Alpha-1-Antitrypsine
- Zonulin
- Histamine in stool

# Blood parameters to evaluate neurological health

- MOG-Peptides in LTT
- MBP Peptides in LTT
- S 100 Protein

Blood parameters to  
evaluate metabolic  
disturbances

- Adiponectin
- Leptin

# Negative impact of intestinal histamine on serotonin system

## Clinical Impact of intestinal Histamine load on Serotonin (5HT) circulation

Muss, C.\*, Schütz, B.\*\*\*, Endler, A.T.\*\*\*

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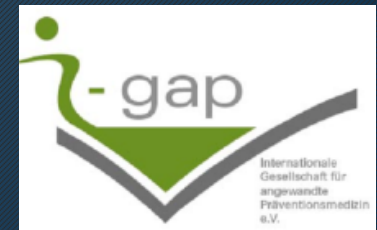
\*\*\* Primar Doz.Dr.med. A.T. Endler. Labor Endler, Währingerstr. 63,1090 Vienna [thomas.endler@laborendler.at](mailto:thomas.endler@laborendler.at)

International Research Group or applied preventive medicine (I-GAP). Währingerstr. 63, 1090 Vienna

### Abstract

We examined the relationship between serotonin circulation and intestinal histamine burden in patients with food intolerance. Serotonin was measured in urine and histamine was determined in the stool samples. Serotonin urine extinction levels correlated negatively with histamine stool levels in our investigation (sRho +0,285; p=0,004). As increased histamine fecal excretion may suggest an inflammatory process or/and histamine intolerance our results are in line with reduced Serotonin uptake and circulation in impaired digestion. As food intolerance may contribute to such conditions further clinical evidence to verify the effects of Histamine on intestinal serotonin (tryptophan) metabolism is suggested.

Muss et al unpublished



# Review of prenatal nutrition on cerebral development

## Impact of prenatal nutrition on the cerebral development of the infant

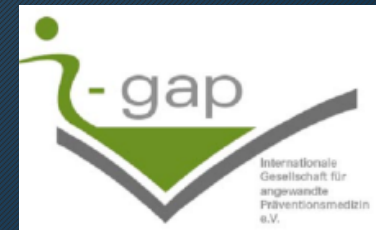
**Claus Muss**

**Abstract**

Impact of prenatal nutrition on the cerebral  
development of the infant

**Keywords:** Nutrition in pregnancy, impact of malnutrition on intelligence in  
children, stimulating components in food for the development of intelligence,  
omega 3 and choline and cerebral development

Muss, C. Prenatal Psychology  
2012





# Choline citrate in chronic inflammatory disease of CNS

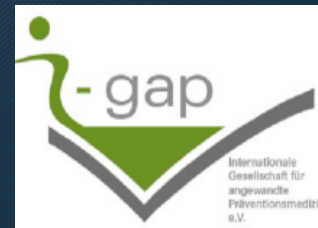
*Neuroendocrinology Letters* Volume 30 No. 3 2009

The effectiveness of choline citrate infusions monitored by lymphocyte transformation test (LTT) in multiple sclerosis. A new approach to the diagnosis and treatment of the disease

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2. Department of Immunology and Microbiology, 1st Medical Faculty, Charles University, Prague; and Department of Immunology, Stockholms University, Stockholm, Sweden.
3. Phönix Laboratory, Benzstraße 10, 71149 Bondorf, Germany.

Muss et al NEL 2012



# Impact of serotonin on insulin secretion and Diabetes mellitus

Serotonin (5HT) correlates with Adiponectin in overweight patients

Muss, C. \*,Endler,T.\*\*

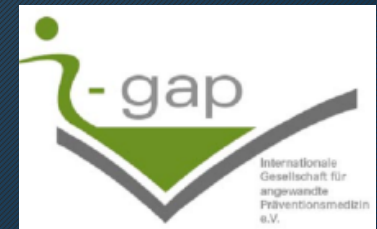
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[thomas.endler@laborendler.at](mailto:thomas.endler@laborendler.at)

## Abstract

We examined the relationship of two neurohormones with neuroendocrine impact (Serotonin (5 HT) and Adiponectin) under standardized clinical conditions in a overweight cohort. Adiponectin was measured in serum and Serotonin was determined in the second morning urine samples. Serotonin correlated positively with Adiponectin in our investigation  $r_{rho} (+0,303; p=0,03)$ . As high Adiponectin level corresponds with a low risk of Insulin resistance our findings refer to possible improvement of prediabetic conditions in overweight patients tracking peripheral serotonin circulation. Further clinical evidence is mandatory to verify the effects of 5 HT in patients with metabolic syndrome.

Muss et al unpublished



# Metabolic health risik markers

## Prediction of Personal Health Risk Factors in Metabolic Syndrome

Claus Muss, MD, DVM, Ph.D.

International scientific Society of applied Preventive medicine (I-GAP)

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### Summary

In European health systems the metabolic syndrome has become of major concern in public health. The metabolic syndrome is an important health risk factor often related to Diabetes and cardiovascular disease. A successful approach to the prevention of the metabolic syndrome therefore contributes to the stabilization of the present and future health system of the European Union decisively. Practical guidelines for the prevention of diabetes and metabolic syndrome are needed urgently. Laboratory diagnostics provide a practicable tool in the early diagnosis of the metabolic syndrome. In this article new laboratory markers such as **Adiponectin, Proinsulin and Asymmetric Dimethylarginine (ADMA)** are discussed as markers of metabolic risk.

Muss et al unpublished



# I-GAP Research example Mitochondriopathy a common cause for chronic disease



## DIAGNOSTIC PARAMETERS IN CLINICAL ASSESSMENT OF MITOCHONDRIOPATHY

MUSS, C., SCHÜTZ, B., ZILEINSKY, Th

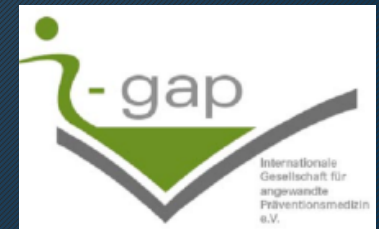
\*Assoc.-Prof.Dr.habil.Dr.med.Claus-Muss-Ph.D.Vysoká škola zdravotníctva a sociálnej práce Sv. Alžbety, N.O. Palackého 1, P.O. Box 104, Public Health SK-810 00 Bratislava; St. Elisabeth-Universität für Forschung und Soziales Bratislava, SK (EU) Public Health  
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Th.ziliensky@biovis.de

### Abstract

The establishment of early diagnostic criteria has to be in the focus and major interest of Public Health concern because early diagnosis may contribute to any easier treatment in any chronic degenerative disease. On a cellular level degenerative disease is attributed to lack of metabolic dysfunction underlying the hypothesis of functional mitochondrial deficiency as major pathogenic factor of chronic degenerative diseases. In our studies we focused on the evaluation of clinical parameters for an early and easy diagnostic regime to assess the impact of mitochondrial deficiency in chronic non-communicable disease (i.e. metabolic syndrome, diabetes mellitus). The total of 23 patients prediagnosed with clinical signs of either metabolic syndrome or diabetes mellitus and 11 healthy patients were analyzed for mitochondrial deficiency by measuring mitochondrial activity and surrogate parameters of nitrosative stress (Nitrotyrosine in blood and Citrulline in Urine).



# Cooperation between I-GAP & Industry

- The International Society for Preventive Medicine (GAP) allows affiliated corporate partners to execute scientific studies and therapeutic observations, in accordance with GCP criteria, within this international cooperation network
- Data collected is made available and published for the international expert forum
- If desired, companies are awarded a seal of approval following a successful quality check by the International Society for Preventive Medicine (IGAP)

# Example for clinical clinical trials with I-GAP

Neuro Endocrinol Lett. 2013;34(1):38-46.

## Papaya preparation (Caricol®) in digestive disorders.

Muss C<sup>1</sup>, Mosgoeller W, Endler T.

### ⊕ Author information

#### Abstract

**OBJECTIVE:** Papaya (*Carica papaya* L.) is used as a natural remedy in abnormal digestion in tropical and industrialized countries. Besides this wide distribution little evidence has been produced with reference to its physiological effect in humans and the proof of efficacy. Former clinical observations had revealed positive effects for patients with constipation, heartburn, and symptoms of irritable bowel syndrome (IBS) after eating papaya preparations. In line with these former positive clinical observations, we studied the clinical effects of the papaya preparation Caricol® in a double blind placebo controlled study design.

**METHODS:** In this study the participants were volunteers, with chronic (prevailing) indigestions and dysfunctions in the gastrointestinal tract. During the trial the intake of the substance of intent and placebo was 20 ml daily for 40 days. The endpoints were the frequency of 22 symptoms recorded before and after the documented intake recorded by questionnaire.

**RESULTS:** The symptoms "Constipation", "Bloating", and "Heartburn" were defined as primary and frequency of "painful (straining) bowel movements" as secondary endpoint. The participation ended after the intake period within two days ("early returnees"). Wash out effects were observed in "late returnees", who returned with a delay of 8.6 ( $\pm 5.95$  days). In the verum group early returnees revealed statistically significant improvements of the symptoms "constipation" and "bloating". The analysis of "heartburn" felt short of significant improvement because of the small number of included cases with this criteria (N=13, p=0.114). None of the significant benefits were observed after the washout phase.

**CONCLUSION:** We conclude from these results, that the papaya preparation (Caricol®) contributes to the maintenance of digestive tract physiology. It ameliorates various functional disturbances, like symptoms of IBS. The mechanism of this digestive tract physiology support is discussed.

Muss et al NEL 2012





*Developing a Food System which is Just and Environmentally Sustainable*



For a healthier  
World

# Testimony of Florence Nightingale

"In the future, which I shall not see, for I am old, may a better way be opened! May the methods by which every infant, every human being, will have the **best** chance of **health**, the methods by which every sick person will have the best chance of recovery, be **learned** and **practiced!** Hospitals are only an intermediate state of civilization never intended, at all events, to take in the whole sick population."

- Florence Nightingale, 1860





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