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What is Health?

Why do we Need to Know it?

Implementation of the Meikirch Model Leads to Improved Health Care

Manual

Second enlarged edition

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For the purpose of readability of the manual the male form has been used most of the time. It may freely be replaced by female forms, because the manual applies equally to both sexes.

EXECUTIVE SUMMARY

1. **Definition of Health:** The term health unfortunately is ambiguous and has magic properties. Its meaning varies with the context in which it is used. Consequently, its application for sales purposes, science, and administration may be unfair or inappropriate. For this reason a new definition of health has been created. The Meikirch Model reads: "Health is a dynamic state of wellbeing characterized by a physical, mental and social potential, which satisfies the demands of a life commensurate with age, culture, and personal responsibility. If the potential is insufficient to satisfy these demands the state is disease." The described potential is composed of two elements, a biologically given and a personally acquired potential. The former decreases with age from birth to death, whereas the latter may increase throughout life, provided it is cared for. Using the Meikirch Model concerns for health may now be expressed by its six components: Two potentials, demands of life, age, culture and personal responsibility.

2. **The Power of the Personally Acquired Potential:** With the help of the Meikirch Model it has become possible to describe medicine and health care unambiguously. When applying these concepts to current health policies, it becomes apparent that they are suboptimal. Today's medicine focuses heavily on physical health and the science of disease pathology, yet humans require an equal emphasis on enhancing the personally acquired potential. Recent evidence has demonstrated that attention toward the personally acquired potential through techniques such as cognitive behavioural therapy, the salutogenesis concept of Antonovsky, and positive psychology has significant health benefits. Together, they improve health literacy, increase positive emotions, and empower patients to assume personal responsibility for their health. Incorporation of the personally acquired potential as a fundamental aspect of health care would have decisive medical, organizational, and financial advantages, ultimately making healthcare more effective.

3. **Launching a Culture of Health:** The Meikirch Model implies that establishing of a culture of health must be based on all six components used to describe health. For this purpose education based on the Meikirch Model will be essential for the population. With appropriate information and public support personal responsibility for health may be stimulated. An example is the dramatic improvement in dental health in Europe during the past 100 years. It is proposed that the Meikirch Model also be specifically publicized for the control and treatment of non-communicable diseases. Compared to other measures proposed by the United Nations it has an outstanding cost/benefit ratio.

4. **Adapting the Meikirch Model to the Layperson:** When applying the Meikirch Model to individuals with limited education the term "potential" may be replaced - as a first approximation - by the word "abilities": abilities given at birth and abilities acquired since birth. It is important to introduce graphic and narrative methods to convey the concept of health to the entire population.

THE NATURE OF HEALTH AND OF HEALTH CARE

1. Introduction

The word "health" is ambiguous, because it's meaning changes with the context, in which it is used[1]. This ambiguity is unfortunate, because it facilitates subtle misunderstandings, which may be used for power struggles, and moral hazard. WHO has defined health in 1946[2]. An important merit of this definition is the introduction of a mental and a social dimension of health. Unfortunately, the definition is quite idealistic and has remained vague. Therefore it has not solved the problem of the ambiguity of the word "health". There are excellent philosophical definitions of health. They are expressed, however, in a philosophical language that make their general use difficult.

Now that health care needs are high and abilities limited, it has become necessary to define health unambiguously and to describe it with words that can be used in medical practice. The Meikirch Model is such a definition[3,4]. It is likely to transform health care systems in multiple ways: It eliminates ambiguity and thereby creates a common language about health. This will reduce misunderstandings and moral hazard. The Meikirch Model defines conditions for good health and this should be useful for political decision making. It offers an explanation for health determinants. A culture of health may be established by teaching the Meikirch Model from the Kindergarten to old age. The Meikirch Model offers a logical structure for the organization of health care systems. It also defines areas of responsibility for health, i.e. personal responsibility, social responsibility and overlapping responsibility. Finally, it clarifies for the people, which factors they need to consider, when they want to strive for health.

Whether or not the full value of the Meikirch Model can be realized in practice, has not as yet been shown. The idea, however, is sufficiently interesting to justify a project in Orissa with the purpose to implement the Meikirch Model. This manual is designed to assist all involved persons to become active and creative in the spirit of this project.

2. Meikirch Model

The Meikirch Model is a description or a definition of health, which is based on a biological understanding of what health really is. At its centre there are three essential elements:

1. **Demands of life:** For continued existence each person has to fulfil all the demands, which are required for living as human being. These demands consist in the production of food, in the protection against the forces of nature, such as cold, heat, wind, wild animals, and other dangers. In addition, the establishment of valuable human relationships is required including decency by appropriate clothing. To guarantee the survival of mankind it is necessary that new-borns are nurtured and children reared until they can fulfil all the demands of life themselves. Finally, appropriate waste disposal must be cared for.

2. **Biologically given abilities:** To meet these demands of life each person receives the wonderful gift of many biologically given abilities. At birth they are the result of the genetic equipment of the person and of the quality of the pregnancy. They represent the biological basis for the existence of each human being and need to be carefully protected throughout the whole life.

3. **Personally acquired abilities:** To meet the demands of life after being born each person has to personally acquire a large number of abilities. Already small children have to learn to sit, to stand and to walk. They further have to acquire immunities to protect themselves from an environment full of bacteria and viruses. From their parents and in school they continuously acquire knowledge, skills and attitudes. Learning and care for personal abilities needs to continue throughout the whole

life. This is crucial for maintaining the aptitude to fulfil the ever changing demands of life in a modern world.

The following examples show that the personally acquired potential is not just mental. The capacity to form immune reactions is given biologically. Yet, immunities result from exposure to infectious agents and from vaccinations, i.e. they are personally acquired. Similarly, the possibility to practice sports is a biologically given gift, whereas each individual makes of it, what he wants. A child, who likes sports and is physically active, acquires a stronger musculoskeletal system than a child, who has been physically inactive. These two examples show that the difference between the two potentials is not just physical or mental, respectively. The personally acquired potential includes physical features.

Without being conscious about it, each individual always uses both types of abilities. They complement each other. Interestingly, health has an additional feature. It offers us a future including longevity. For this reason we have to consider not only our present abilities here and now, but also all our possible future abilities. The word used to express this aspect of the future is called potential. Consequently, an individual with a potential that suffices to meet his demands of life is healthy. In contrast, a person whose potential is not strong enough to meet the demands of life is diseased. In this manual no distinction is made between the different words to describe ill health. The term disease is used for all of them, including illness, sickness ailment, and malady.

Based on the above considerations the wording of the Meikirch Model reads as follows:

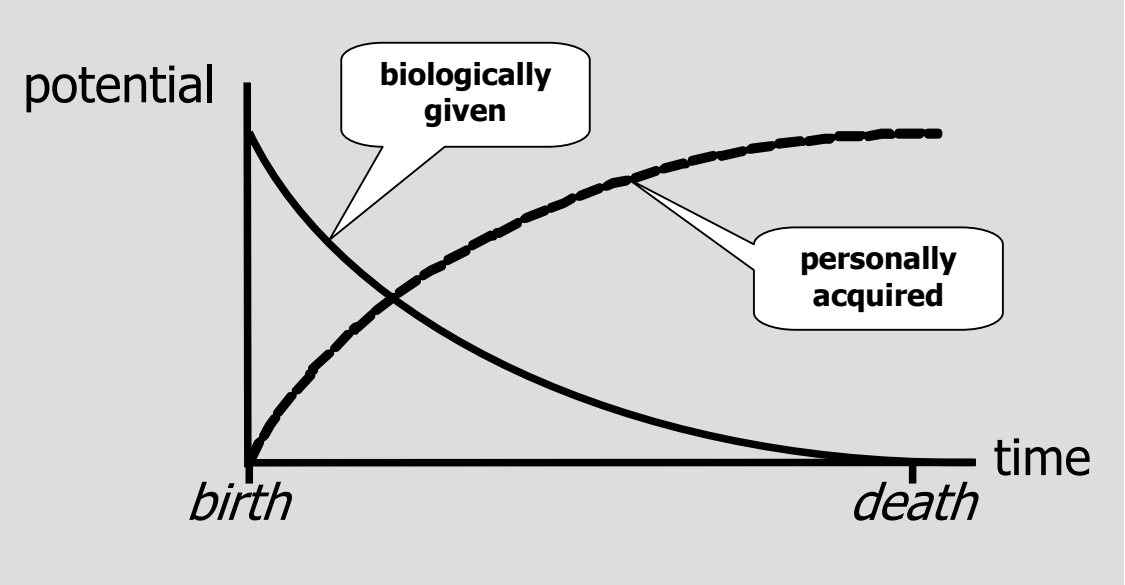
“Health is a dynamic state of wellbeing characterized by a physical, mental and social potential, which satisfies the demands of a life commensurate with age, culture, and personal responsibility. If the potential is insufficient to satisfy these demands the state is disease.”

As shown in fig. 1 the biologically given potential falls throughout life and reaches zero at the time of death. This corresponds with the importance of the genes for a person, which decreases continuously. The personally acquired potential is small at birth, develops rapidly at first and more slowly thereafter. As a result of personal efforts it can be augmented throughout the whole of life. This corresponds to the influence of epigenetics, i.e. the regulation of genes. Apparently, for long-term health, development of the personality including self-responsibility plays a crucial role. Therefore, in each individual the personally acquired potential is an essential feature of the sustainability of health. It also is part of the relationship between individuals and society[5]. Social influences may support the personally acquired potential or may damage it.

Figure 1

Simplified schematic representation of the time course of the two potentials between birth and death:

The curves are drawn arbitrarily. In reality they are neither smooth nor equal among different persons. The figure shows that the relationship between the biologically given and the personally acquired potential changes continuously throughout the course of life. In children the biologically given is higher than the personally acquired potential. In order to live well old persons, have to depend much less on the biologically given potential and correspondingly more on their personally acquired potential. This is the reason, why the personally acquired potential needs to be cared for throughout the whole life.



It should be noted, that in children the biologically given potential is dominant and must be supported by hygiene, sufficient healthy food and physical activity. In contrast, the personally acquired potential is relatively small and has to grow rapidly. For this purpose the children have to be loved and taught by parents and in schools.	Middle aged individuals have to take good care of both potentials. The biologically given potential has to be protected from accidents and diseases. The personally acquired potential needs to be cultivated by leading a good and productive life, by love for all people, forgiveness and meditation.	Senior persons have a reduced biologically given potential. If their personally acquired potential is sufficiently developed they live relatively well despite reduced physical abilities. The personally acquired potential supports people to become old.

The demands of life a person has to fulfill vary with his or her age. For instance, the newborn is completely dependent on the mother. Later, the child learns to be more independent and to assume more and more responsibility. People of working age need not only to care for themselves but also for their social environment, i.e. the wellbeing of dependents, care for children and elderly people. For seniors, the demands of life are reduced, but they risk becoming dependent on others. In a multicultural society, the demands of life are different from one culture to another. The personal responsibility of creating a meaningful life, an aspect of the personally acquired potential, is of central importance for successfully responding to the demands of life.

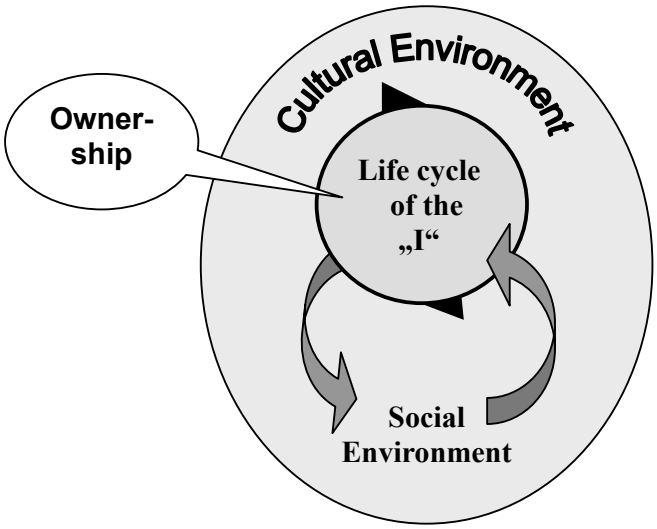
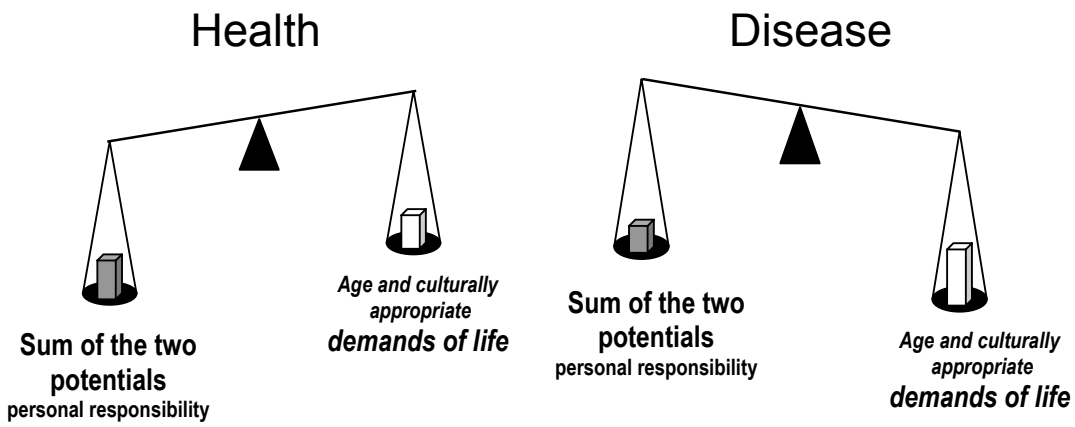


FIGURE 2
The demands of life are embedded in a cultural context and change with the life cycle. The child is dependent on the support of his or her parents, while the productive adult human being must contribute to the social environment. In old age she or he will again be supported by the society. Accordingly, the ownership changes in the course of life.

Meikirch is a village near the capital of Switzerland. From this village the first publication of the definition of health was published. Only later it was called Meikirch Model. In historical times a monk came to preach in this church. At that time it was called "Monks church" and with time Meikirch. The word "-kirch" means church.

Health results from the two potentials merging together in order that every human being is able to meet the requirements of coping with the demands of life. When the potentials are insufficient to meet the demands, the state is disease. Although the two potentials are qualitatively quite different, they must be thought of together to assess the overall potential. The experience of many physicians reveals that the personally acquired potential can compensate for many defects of the biologically given potential. It is thus intuitively understandable that the two potentials may be thought of as a sum. The word "potential" which includes all present and future abilities of a person, is suitable for medicine, particularly because physicians are primarily concerned with the future of their patients. The very purpose of any treatment is to improve the immediate, medium, or long term future of the patient. It is therefore essential to see the abilities of a patient not only in the present, but to preserve them as long as possible to insure a good future.

FIGURE 3
Health and disease resulting from the balance between the potentials and demands of life. It should be clarified here that the demands we humans may have to live a good life do not count. Health is concerned with the demands that life has upon us.



This brief summary of the Meikirch Model shows that within a medical consultation all six factors that determine health may be assessed if needed to evaluate the state of health of a person. This may be relevant for diagnosis and therapy, but also for legal and insurance purposes.

Six factors relevant for the assessment of health	***Benefit of the six factors for defining health***
1. Biologically given potential 2. Personally acquired potential 3. Demands of life 4. Personal responsibility (ownership) 5. Age 6. Culture	*If health problems are to be analysed, projects to be planned, or results to be discussed, it is very helpful to use a solid methodological approach. For this purpose the six factors render a sound logical structure for the evaluation of health problems.*

The fact that health consists of six components has great importance for the practice of health care. Age and culture are easy to assess. No person, however, should be dismissed from a consultation without at least a short assessment of the two potentials, the demands of life and the personal responsibility. It is also quite important to discuss the results of the appraisal with the patients.

Some illustrative examples:

Example 1: A 27-year old mother of five small children comes because of fatigue. It is found that she has anemia, i.e. not enough blood to transport the oxygen from the lung to the organs. In addition care of five children without any help is a demand, which is too high for her. Her husband is working in another town. It is good to give her iron to restore the blood. But she also must be advised to find some help in taking care of the children.

Comment: Her biologically given potential is reduced because of the anemia. In addition, the demands of life overburden her. For this reason the larger family should be asked to help her.

Example 2: A 41-year old man comes with a laceration on the head. While taking care of the wound, he is asked, why he fell. He hesitates to answer, but the accompanying person reports that he had drunken too much alcohol. He therefore must be told that he has to assume personal responsibility for his health and that with alcohol he destroys his personally acquired potential.

Comment: In such situations attention most often is paid only to the laceration, i.e. to the damage to the biologically given potential. The underlying alcohol problem is the result of an insufficiently developed personally acquired potential. That is where he needs help. Advice about the nature and seriousness of alcohol intake may not cure many alcoholics, but once the six factors of the Meikirch Model relevant for health have become generally known in the society, people may help such persons to stop drinking. Perhaps also other solutions are found, e.g. the Alcoholics Anonymous or AA (Email:prabhudpatel@hotmail.com).

Example 3: A 45-year old woman with diabetes comes to measure her fasting blood sugar. She feels healthy. She had been too heavy, but lost 15 kg weight, since her diabetes was discovered 2 year ago. She has taken her tablets regularly. At this consultation her fasting blood sugar is normal. *Comment:* The diabetes represents damage to her biologically given potential. Her weight loss and discipline with the tablets is possible only because she has a well-developed personally acquired potential and assumes self- responsibility for her health. She can be complemented for it and be encouraged to continue like this. This example shows another feature of the Meikirch Model. A well treated person can be healthy despite a medical condition, which is a disease. At the time of her consultation her potential was sufficient to cope with her demands of life.

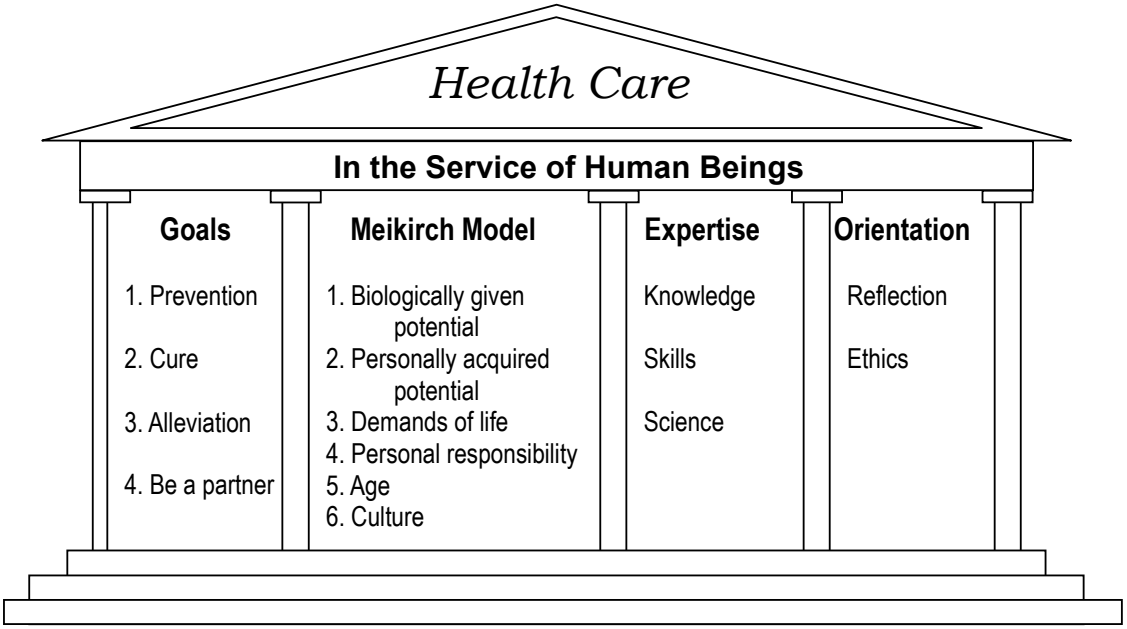
This short description of the Meikirch Model and the examples show that “health” is no longer an ambiguous word. On the basis of the six criteria people can be diagnosed as healthy or diseased. If they have a disease the elements of the Meikirch Model that cause the disease can be named. Their responsibility for health becomes obvious. This is particularly important, because chronic diseases require long term self-treatment, which does not function without self-responsibility based on a well-developed personally acquired potential. For this reason it is essential to create a culture of health, which strongly supports the development of personally acquired potential and self-responsibility. When people - healthy and diseased persons –truly understand what health is, they can take much better care of themselves.

3. Management of health care requires a definition of health

In health care the Meikirch Model is an important concept. By itself, however, it is insufficient to describe the nature of health care or of medicine. Health care is composed of the following four components:[6]

1. The goals of health care
2. A proper definition of health and disease, i.e. the Meikirch Model
3. The needed expertise
4. The necessary ethical reflection

FIGURE 4
Schematic representation of the identity of health care



What is the need for a definition of health in the above diagram, specifically the need for the Meikirch Model? Health care systems involve persons of many different professions and roles. Each of them has developed his own personal concept of health, which resulted from professional formation, life experiences and personal interests. For this reason each individual having to do with the health care system has his own idea about what health is and how he wants to contribute to or to use the health care system (see figure 5). Consequently, there is no unified goal for patient care, but as many goals as there are persons involved. By default this leads to misunderstandings, to inadequate coordination of services, to important losses, and to moral hazard. Today this is an important reason for the high costs of medical care.

FIGURE 5
The need for an explicit common goal to ensure cooperation of persons concerned with health care becomes obvious, if the large number of participants is considered.

What would happen, if all humans participating in the process of health care - as depicted above - would have a common concept of health and disease? How would health care look like? Perception of each other and teamwork in the interest of diseased human beings would be much easier. The resulting improved collaboration would render health care more effective and more cost-effective. How then can a mutual understanding about a common goal be realized? This will be possible only with a definition of health and disease, which is generally accepted, i.e. the Meikirch Model. Economists agree that in an organization the success of leadership is closely related to the development of a joint vision that is owned by all involved persons. It is surprising then, that this aspect of health care has been utterly neglected so far in the whole world.

4. Goals of Medicine

An international project of the Hastings Center (in Garrison, NY, USA) resulted in a description of four goals for medicine and health care[7]. Based on the Meikirch Model, the objectives of medicine may be simplified[8] as follows:

The goals are:

- **Prevention:** To maintain health for the people
- **Cure:** To help sick persons to return to health
- **Care:** To support diseased persons in living with their condition as well as possible
- **Respect:** To accompany dying persons

5. Expertise

Within medicine and health care, there must always be a consensus on the quality of service provision. The necessary competencies are divided into knowledge, skills and attitudes that must be acquired during professional formation, postgraduate training, and continuing education. There are corresponding curricula in universities and professional associations.

Unfortunately most current curricula ignore to teach critical reflection, e.g. the science around the question: “How do I know, what I believe to know”. The distinction between knowledge based on natural sciences, humanities and other forms of knowledge is fundamental. Yet, even the latter types must be subjected to a reasoned approach. Critical reflection should no longer be neglected by health care professionals, but rather become a central issue at all levels of education. Considering the Meikirch Model this type of thinking is pivotal, because the two potentials are fundamentally different. The biologically given potential may be analyzed exclusively by methods of natural sciences, whereas the personally acquired potential is much more complex. It requires an approach that includes modern psychology and humanities.

6. Ethical Reflection

For three reasons, ethical reflection is important: First, in the practice of health care value judgments are frequently needed. In complex cases this may be quite difficult. Secondly, the ethical attitude of members such as doctors, nurses and other medical practitioners is an important basis for the population's trust in the medical profession. Third, ethics in the last few decades has become a crucial aspect of medical research. Since the time of the Greek physician Hippocrates, ethics in medicine have played an important role. Also to date its importance is undisputed. At most universities there are appropriate teaching and research capacities. Ethics consultation has taken hold in medical practice. It should be noted, however, that ethics must not be limited to the intellectual aspects of medicine. For the Swiss educational reformer Johann Heinrich Pestalozzi

(1746 –1827) attention to the simultaneous development of "head, heart and hand" was of primary importance. For medical education, we ought to apply the same philosophy. Within the practice of medicine and health care medical ethics must establish itself as a culture.

There is much literature on medical ethics, which today is indeed highly developed yet fragile. Within this context only the Physician's Charter of Medical Professionalism may be mentioned here, because it deals with the everyday practice of medicine. The Charter postulates the following three basic principles[9]:

1. The primacy of patients' welfare
2. The patients' autonomy and social justice
3. A set of professional responsibilities

They include the 10 commitments that are summarized below.

- Commitments in "The Physician's Charter of Medical Professionalism"

1. Commitment to professional competence
2. Commitment to honesty with patients
3. Commitment to patients' confidentiality
4. Commitment to maintaining appropriate relationships with patients
5. Commitment to improving the quality of care
6. Commitment to improving access to care
7. Commitment to a just distribution of limited abilities
8. Commitment to scientific knowledge
9. Commitment to maintaining trust by managing conflicts of interest
10. Commitment to professional responsibilities

7. Identity of health care - What is it and what is it for?

Theoretical background[10]

By presenting the essential features of the health care system as given above, an important part of its "identity" is defined. The other parts have continuously to be created in everyday life. The concept of identity consists of three elements. These include a "distinctive self-description", a "consistent behavior within the system", and a "behavior toward the outside that can be attributed to the self-description". A system that really lives its identity can maintain it despite changes of its surroundings, if it responds by continuously reorganizing itself internally.

FIGURE 6
Schematic diagram of the three elements of the identity of a social system such as the health care system

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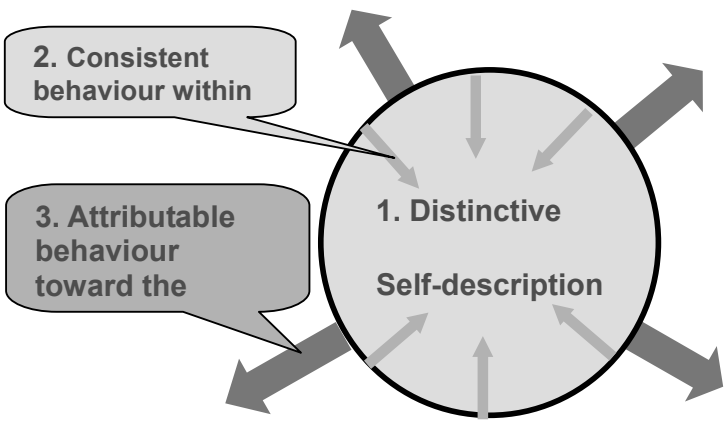


Embedding of Health Care into the Society

Health care is made up of many small and large independent service organizations, all pursuing their own specific objectives. In addition each may also have its own agenda. As a result, consistency of the internal behavior within the health care system by various stakeholders is obviously limited. For this reason it is now pivotal to clearly and explicitly define the identity of health care as a system and to enforce it with the highest priority. It is the responsibility of all professionals who participate in the system to be concerned with its identity. The same applies to the professional societies of all other medical professions. It is not primarily a task for politicians to define what health care ought to be. They should ask for a phrasing of the identity from relevant professionals and lay persons and include it into the description of the health care system.

Properties of Health Care

1. Health care receives its inner strength from the fact that it lives its "soul", i.e. it realizes its identity comprehensively. To this end, its internal behavior must correspond with its self-description and its external activities must provide a correspondingly consistent picture. Obviously, these two conditions cannot be fulfilled as long as the identity of the health care system has not been worked out and legitimized. These arguments explain why it is vital for health care now to take on this task and formulate its identity explicitly.

2. An important requirement for a lived identity is that its explicit formulation be developed within a social process. The above-summarized description has not yet done this. It could, however, be used as a starting point for the necessary debate. Changes that may result from such a process would then have the required high level of social legitimacy.

3. Self-description is an indispensable prerequisite for the proper conduct by members of a social system, here consisting of health personnel such as doctors, nurses and other health workers. To the extent that all internal components are oriented toward its identity and act accordingly, a social system develops dynamics and power. Due to internal conflicts of interest, this condition is most likely never completely fulfilled in any real system. It is an important leadership responsibility of all parent-bodies, therefore, to champion for the identification with a recognized "identity" of all downstream subsystems including employees and other stakeholders. To that end, typically, many meetings need to be organized, immaterial and material incentives are to be offered and disincentives eliminated. A stronger input for achieving a more solid identification of every coworker with the identity of the health care system would be a valuable task for all people in positions of responsibility.

> Already the Hippocratic Oath was concerned with the enforcement of the rules of medicine, for it concludes with the following sanction: "If I keep this oath faithfully, may I enjoy my life and practice my art, respected by all men and in all times; but if I swerve from it or violate it, may the reverse be my lot."
>
> (Hippocrates was a Greek physician who developed the first code of ethics for physicians.)

Emergence

The importance of the self-description of medicine is to be further extended by the phenomenon of “emergence”. This term denotes new integral properties, resulting in a system, if individual

subsystems are subordinate to the rules of the system. The concept of emergence can be illustrated best with examples. For instance, we feel emergence immediately when we consider that we human beings are more than the sum of our organ systems. We may witness emergence also in traffic. If we subject ourselves to the rules of the road, traffic flows and all reach their destinations in a relatively short period of time. If all traffic laws were abolished, one would have to negotiate with each driver of an encountered vehicle, as to who has precedence or whether to pass on the right or left hand side. All motorists can see at once that this is an intolerable situation. They submit to the traffic rules, therefore, and benefit from a moving traffic, i.e. they gain through participation in the emergence of the highway transport system. According to systems theory, the profit resulting from participation is much greater than the loss of freedom that arises by the abandonment of being able to travel on the road as each one wants.

Transferring this concept to the health care system emergence means that all coworkers in the health care system gain more from submitting to a good cooperation than they lose by giving up some degrees of freedom. However, there is the difficulty that in medicine the benefit of emergence cannot be made visible as easily as with the road example. Therefore in health care, the fidelity to the identity cannot be achieved as easily as on the road and it is of crucial importance for medicine to have a unique self-description, from which emergence may be derived. A continuous debate about emergence is needed in order to achieve a general awareness of its importance.

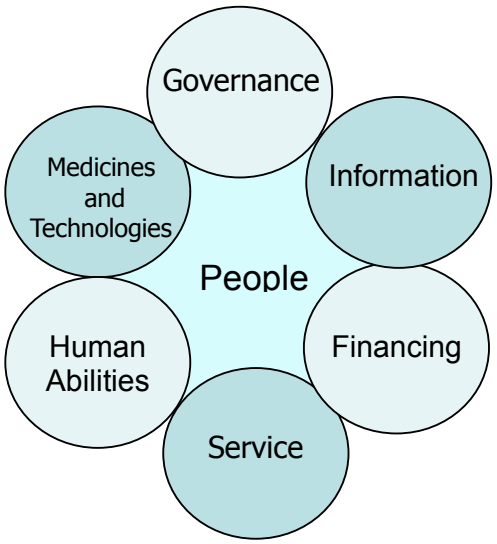
As a young doctor Johannes Bircher MD experienced emergence of a social system at the Mayo Clinic in Rochester, Minnesota USA. At that time he worked there for three years as a fellow in internal medicine. Each of the 400 consultants, i.e. of senior doctors, was proud of the achievements of "his Clinic". The distinctive features of all physicians were that they continually strove for medical excellence. This they achieved through persistent learning and an outstanding cooperation among each other. The fellows were enthusiastic and felt it to be a great privilege to experience such an atmosphere and such a quality of patient care. The training at the Mayo Clinic became a trademark for the fellows. As a result of emergence the Mayo Clinic is more able than other institutions to offer excellence to patients, senior physicians, and trainees. This very property is the source of its appeal. The Mayo Clinic is an outstanding example. Also in other countries health care systems can achieve a high level of excellence provided they truly live their identity and thereby create emergence.

8. How to induce changes in a health care system

Social systems, such as the health care system exhibit a high level of complexity. For this reason desired changes can be induced only with a systems approach. Recently, the world health organization (WHO) has recognized this and has published an excellent book entitled "Systems Thinking for Health System Strengthening"[11,12]. In it the authors describe how interventions usually attain their goals, but are often accompanied by undesired effects in other areas. Through this, damage for health care can arise that dominates in the balance. In order to avoid such happenings, a procedure is needed that takes the complexity of the health system into consideration. The WHO book is an overview that is well presented didactically.

The authors are of the opinion that six modules need to be taken into consideration. They emphasize that dynamic relationships exist among them. For this reason each intervention affects not only the area in which a change is desired, it also has effects in all the other modules.

Fig. 7:
Modules of a health care system and their interactions



In the analysis of problems and the planning of changes, the following dynamics of the relationships must be kept in mind:

1. The nature of the relationships between the modules
2. The "distance" between the modules and what takes place in each of them
3. The synergies that arise from the interactions among the modules

Each intervention into a health care system must be planned with the representatives of all the modules. In this the general principles of a modern delegation process are to be mutually kept in mind and worked through[13]. Each participant has to agree to the changes without pressures. Due to the complexities of the task, milestones have to be fixed and respected by all partakers. As a rule, mile stones are planned as evaluation projects and built into the change process. The WHO booklet is very rewarding. It provides clear tips as to how one should proceed.

The ten rules of system thinking for the introduction of an intervention in the health care system are:

1. *Convene stakeholders:* Stakeholders representing each building block, plus selected intervention designers and implementers, users of the health system, and representatives of the research community are to be convened.
2. *Collectively brainstorm:* Collectively deliberate on possible system-wide effects of the proposed intervention respecting systems characteristics (feedback, time delays, policy resistance, etc.) and systems dynamics.
3. *Conceptualize effects:* Develop a conceptual pathway mapping how the intervention will affect health and the health system through its sub-systems.
4. *Adapt and redesign:* Adapt and redesign the proposed intervention to optimize synergies and other positive effects while avoiding or minimizing any potentially major negative effects.
5. *Determine indicators:* Decide on indicators that are important to track in the re-designed intervention (from process to issues to context) across the affected sub-systems.
6. *Choose methods:* Decide on evaluation methods to best track the indicators.
7. *Select design:* Opt for the evaluation design that best manages the methods and fits the nature of the intervention.
8. *Develop plan and timeline:* Collectively develop an evaluation plan and timeline by engaging the necessary disciplines.
9. *Set a budget:* Determine the budget and scale by considering implications for both the intervention and the evaluation partnership.
10. *Source funding:* Assemble funding to support the evaluation before the intervention begins.

IMPLEMENTATION OF THE MEIKIRCH MODEL

1. Health care for patients

The initial most important point is not any longer to think about health as a whole. Instead for each health problem each of the six components of the Meikirch-Model needs to be investigated, i.e. the demands of life, the biologically given potential, the personally acquired potential, the personal responsibility, age and culture. When investigating a health problem, the first step consists in gathering adequate knowledge about each of them. This will not only allow a solid judgement about the health of a person or a social body, but it also indicates which health components are in need to be improved. It may not always be possible to adequately respond to each of them. But this approach is more convincing for responsible authorities than to just name a few measures, e.g. determinants of health that could possibly improve health. Neglect of the rational basis on which these measures are built leads to suboptimal results.

Table 1
Examples of reduced health as expressed by the six components of the Meikirch Model. They are not exhaustive. Many other possibilities exist.

Component	**Some examples**
Biologically given potential	Undernourishment, inadequate personal hygiene, environmental pollution, inadequate sanitation, risky sports, unprotected sex, etc.
Personally acquired potential	Insufficient schooling, adversities in childhood, lack of purpose in life, conflict in family or with employer, emotionally risky behaviour, psycho-social pressures, etc.
Demands of life	Insufficient salary, unhealthy demands by the employer, important problems in the family, etc.
Self-responsibility	Creating acceptable conditions for living, keeping a positive emotional attitude, abstaining from or quitting the use of tobacco and alcohol, maintaining a healthy weight, continuing adequate interaction with health care providers, e.g. compliance with necessary drug intake, etc.
Age	Vulnerability varies with age
Culture	Social background, immigration, religion, other, etc.

Primary health care should always consider all six components of the Meikirch Model. Very often, only the presenting physical complaint is subjected to diagnosis and treatment. In many cases this is OK. Yet, in others it may be utterly insufficient, because the background, which has created the disease, is neglected. This usually leads to insufficient results and unnecessary costs.

Currently the United Nations emphasize the control and treatment of non-communicable diseases, such as cardiovascular diseases, obesity and diabetes, chronic respiratory diseases, and cancer. Much is known about how the damage to the biologically given potential has occurred, yet it has been almost impossible to take care of these causes. Effective measures to control and treat all these conditions are known, but their implementation has been deficient. This is due to the fact that in general the personally acquired potential of such patients has not been taken into consideration. Physical exercise, normalisation of blood pressure and cholesterol are effective to control cardiovascular diseases. Reduced food intake takes care of obesity and dramatically reduces the incidence of diabetes and its complications. Yet, for persons with overweight it appears almost impossible to again achieve a normal body weight. In fact, in most countries the proportion of

persons with obesity increases continuously. The prevalence of chronic respiratory diseases will dramatically fall, once all people stop smoking. Many cancers are related to risky or unhealthy behaviour that could be avoided. All of these unsatisfactory results of health care are related to the fact that ordinarily the personally acquired potential is neglected. Unfortunately there have been good reasons for this. Physicians all over the world have often been utterly disappointed, when they tried to help their patients to be physically more active, to reduce weight, to stop smoking, etc. Today the idea of the personally acquired potential offers new alternatives. The past failures may now be looked at from a new angle. Consequently new and effective solutions may result.

The personally acquired potential is the interface between individual health and the challenges of each person by the society. It is now well documented that many social factors are related to the health of the people. They are known as social determinants of health[14]. In developed countries income inequality appears to be a particularly important one: The more unequal the income, the worse the overall health outcome. Wilkinson and Pickett formed an index of health and social problems and correlated it with income inequality in different countries[15]. Analyzing 20 developed countries they found a very close correlation: With rising inequality the index became worse. Analogous results could be found, when the comparison involved the different states in the US. In contrast, the average income in the different countries or states of the US was not at all correlated with the index. Apparently, societies with high income inequalities and large status differences somehow are associated with levels of anxiety, social insecurity, and loss of self-esteem, which are damaging to health. The increase in social inequality seems to demand correspondingly larger efforts to acquire personal potential, and persons who give up will be less well. These relationships document that the personally acquired potential may be regarded as the critical interface between demands by the society and individual health.

In this context the question arises how cultural aspects are associated with the so-called “civilization-related diseases”. Cigarette smoking, alcohol abuse, lack of physical exercise, environmental pollution, excessive noise, stress and sensory overload due to the media have been enumerated as triggering factors. This list shows the help that the concept of a personally acquired potential can offer. It can aid people to become conscious that they themselves can do something about their health. Future research may be moved in the corresponding direction. Today, firms and organizations must assume much more responsibility for the personally acquired potential of their employees. They could adapt their policies in such a way that the employees no longer need to neglect their personally acquired potential but rather may increase it. This lies certainly in the employer’s own interest.

2. Methods to deal with the personally acquired potential

In the past development of the personality was a field for religious leaders, who in part were excellent, in part fraudulent or anything in between. Fortunately, in recent decades new methods to support human beings in developing their personally acquired potential and to assume responsibility for health have been developed. In psychotherapy the cognitive behavioural therapy is now considered to be the bench mark. In addition the concept of salutogenesis by Aaron Antonovsky is now well established. More recently positive psychology offers a new approach to lead a better life and remain healthier. The emotional freedom technique also is an interesting new method. It can alleviate many symptoms, when they are remnants from painful past experiences. With the help of these tools the development of personally acquired potential remains no longer enigmatic, but appears to become feasible now for everybody.

2.1. Cognitive behavioural therapy or CBT[16]

CBT is scientifically well documented. Among the many techniques of psychotherapy CBT has become the standard, because it is effective and its cost-effectiveness so far was found to be the most favourable. Yet, it requires the help of an experienced psychotherapist. The idea behind CBT

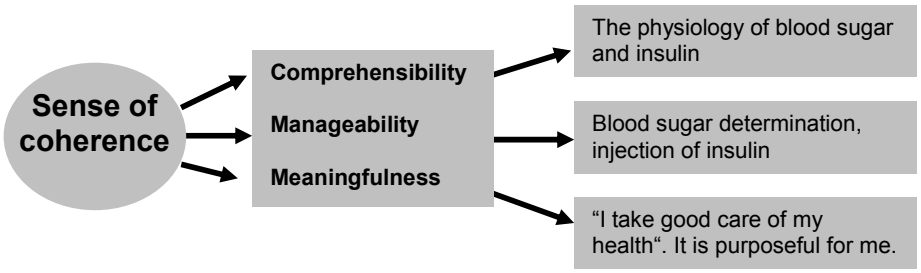
is that in each individual a specific life situation leads to a group of thoughts, which then result in corresponding feelings and actions. By working through this thinking about the situation a person may come to the conclusion that he can think differently about it. When a corresponding situation arises the next time, she or he will act according to a worked out new and healthier plan. The change in behaviour is then followed by new, presumably healthier feelings. This procedure is repeated until the patient can deal with the specific situation in a healthy way.

CBT requires a trained psychotherapist who has experience with this method. It has shown good results in anxiety, depression, panic, phobias, stress syndromes, obsessive compulsive disorder, and post-traumatic stress disorder. The hard part consists in the necessity for the patient to confront himself with his problem, which may be quite painful. To guide the patient through this difficult challenge is the task of the therapist. Unfortunately, the requirement of an experienced therapist and the costs of CBT limit its use.

2.2. Antonovsky's Concept of Salutogenesis[17] (Attachment 5)

Aaron Antonovsky assumed that everyone constantly moves along a continuum in the direction of either health or disease. In an attempt to find the mechanisms that influence these movements, he came up with his concept of a "sense of coherence" (fig. 7), which consists of the following three elements: Comprehensibility, manageability, and meaningfulness. This idea can be illustrated easily using the example of type I diabetes mellitus. A patient with this disease must know precisely which factors influence her blood sugar and also understand what insulin does to her (comprehensibility). She must be able to measure her blood sugar and to make her insulin injections herself (manageability). In addition, she must find it purposeful to treat her diabetes herself as well as possible (meaningfulness). Only when these three conditions are met does she move in the direction of health, otherwise her course goes towards disease. Analogous deliberations can be applied to practically all chronic conditions. For this reason, it is decisive that all patients learn what their condition is, how they can best treat it, and why treatment is in their best interest. They must be trained about everything they need to know in order to treat them-selves well. They also must recognize the personal benefit of a good self-treatment. In health care many examples show that one cannot take Antonovsky's postulates for granted. All physical or psychological impairments are challenges for patients that may be difficult to accept emotionally and to work through. When a physician prescribes a treatment, the patient may want to follow it and at the same time may not like it. Ambivalence often puts the meaningfulness of a careful self-treatment into question.

FIGURE 7
A diagram illustrating Antonovsky's salutogenesis concept: The sense of coherence determines whether a person moves in the direction of disease or health. This sense of coherence consists of the elements comprehensibility, manageability and meaningfulness, illustrated here with diabetes type I as an example. Every diabetic must understand the physiology of blood sugar and insulin. He must determine his level of blood sugar and be able to inject insulin himself. In addition, he must be convinced that a good control of his blood sugar is meaningful and important. If these conditions are not fulfilled, his sense of coherence is reduced and the patient's future health will be compromised.



The salutogenesis concept of Antonovsky reveals strikingly, that for patients with diabetes prescription of insulin is not enough. Physicians have the responsibility to assure that the sense of coherence of their patients is sufficiently cared for. Consequently, the interaction of patients with their physician and the trust of each patient in his personal physician are not minor matters. Unfortunately, in developed countries they often are subjected to economic pressures. This is counterproductive. Health care costs probably would be reduced, if the tariffs for consultations would not hinder but promote the personal patient-physician interaction.

2.3. Positive Psychology[18] (Attachment 6)

This is a scientifically well documented method that has been developed in the last decade. Here only the essence shall be presented, yet it is well worth to read the book by Barbara Fredrickson[19]. We all know the experience of subtle pleasant feelings of positivity, such as love, awe, joy, pride, gratitude, serenity, interest, inspiration, and love. They open us up toward the outer and inner world. With positive feelings we perceive more of our surroundings and have access to ideas and feelings within us, which are unattainable under normal circumstances. Positive feelings build abilities for us and help us to explore new aspects of life and thereby assist us in our personality development. In other words positive feelings strengthen our personally acquired potential. They truly create a better future for each of us. It should be noted, however, that positive feelings are helpful only, provided they are heart-felt. If they are not sincere expressions of our inner life, they may rather be damaging. Negative feelings, such as anger, guilt, sadness, disgust, hate and anxiety focus us on the object of the negative emotion and narrow us down. They either do nothing to our personally acquired potential or may even damage it.

Positive persons live a happier life, become sick less often, recover from an illness or a stressful life event more rapidly, sleep better, are less often depressed and live appreciably longer. This is of utmost interest in health care, because the personally acquired potential and personal responsibility are such important features of health. They have so far been neglected. Yet, the good message is that positivity or positive feelings can be increased. There are many methods to do this. It already helps to discover, when something good happens and to freely express heart-felt thankfulness. Other persons will be touched by this and human relationships will improve. It also helps to see the half full instead of the half empty glass. Each incident has good and bad sides to it. We should learn to recognize the good side of life and to enjoy it. Good events should consciously be savoured, immediately when they occur. All these advices are common sense, yet their importance for health has not been generally recognized as yet. They require mindfulness and it will be well worth to follow them. Mindfulness entails attending to your own inner experience with full awareness and without judgement. This may be further strengthened e.g. by Buddhist meditation.

2.4. Emotional freedom technique (or EFT)[20] (Attachment 11)

EFT has been developed in the nineties and popularized since 2000 by Gary Craig. Lately it its evidence base has been recognized by the American Psychological Association. This now gives it the status of a scientifically solid treatment. Practitioners report important therapeutic effects in many different conditions. It is worth to be considered. The idea behind EFT is the following: Bad, painful events of the past are stored in our memory and activated, whenever something happens that reminds us of this bad event. This will even occur, if we do not remember the specific event any more. The interesting fact is now, that the memory of a past event becomes unstable at the time, when it is brought up to consciousness. This moment therefore is combined with tapping of acupuncture points, a procedure that quiets the limbic system down and thereby reduces the intensity of pain or anxiety. Thereafter, when the event is stored again in our memory, it will be stored in the new and much less stressful form. This procedure can be repeated until all pain or anxiety is gone. EFT may also be effective against many different aches in all parts of the body. It is easily learned and done by the patients themselves. When access to one's own past events may be difficult, it generally is useful to get help from an experienced EFT-practitioner.

3. Creation of a culture of human health

The term culture means a pattern of human knowledge, beliefs, and behavior that is related to symbolic thought and social learning. The term culture may therefore be applied to health, because most people feel that it is a very important good for them. In most societies the thinking about health is governed by both, beliefs and by knowledge. In fact, physicians experience time and again that patients discard knowledge in favor of their beliefs and then behave accordingly. Nevertheless, knowledge can be presented in such a way that it may be trusted. As a result more and more people accept it and adapt their behavior accordingly. A good example for Europe is dental hygiene. At the end of the 19.th century most people were eating so many sweets without cleaning their teeth that by the age of 20 to 30 they had to wear dentures. In the 20th century prevention of dental caries has gradually become commonplace in western societies and now a majority of people live with their own teeth. A culture of dental hygiene with excellent consequences has become established.

People who want to be healthy must know what health is. Therefore, it is now time to develop a "culture of human health". The Meikirch-Model offers the possibility to analyse the necessary components. Concern for health must become part of self-responsibility of every person and should include the following aspects:

1. Care to maintain the biologically given potential as much as possible.
2. Care to continuously develop the personally acquired potential
3. Care to organize the demands of life in such a way that they remain commensurate to the two potentials

Table 2:
In order to remain healthy individuals have to assume responsibility for each of the two components of their potentials. Yet, these are fundamentally different as shown by the examples of the table.

Biologically given potential	**Personally acquired potential**
1. Healthy and hygienic nutrition 2. Bodily hygiene 3. Measures to prevent infections 4. Avoidance of toxic compounds, e.g. smoking, alcohol, etc. 5. Vaccinations 6. Physical activity 7. Maintenance of body weight. 8. Safe sex, pregnancy, delivery, mother and child care 9. etc.	1. Tenderness and love for babies and children by their parents 2. Education of children 3. Adequate schooling 4. Support for progressively growing self responsibility 5. Emotional maturation 6. Salutogenesis 7. Positive psychology 8. Meditation 9. etc.

The creation of a culture of human health has to start with the mother and child care. It then should be taught in the Kindergarten and in schools. It definitely must be part of higher and continued education. Radio and television should be used to educate about all aspects of health. Obviously this teaching has to be adapted to the specific age and social group.

As a general rule teaching of theories does not touch people. It appears important therefore to engage artists who can create illustrations and stories that are taken from the life of people. They transport central messages much better. Children's books can be most useful. Already children should learn that market forces serve the market and not the people. Once they realize this, marketing and selling of unhealthy foods and drinks becomes much less interesting.

In order to achieve a culture of health it is important to also teach about the relevance of the personally acquired potential. This will become important for the people, if they can see that they can do something about it. For this purpose the possibilities described above are very helpful: Positive psychology is an excellent tool. Meditation of mindfulness is helpful. Also the emotional freedom technique can contribute. The story of dental hygiene in Europe suggests that a solid culture of health will produce excellent results that have not been possible so far. Obese persons may lose weight and smokers may be able to stop smoking. People will be able to maintain physical fitness with sports adapted to their physical condition. Persons with high blood pressure may get their blood pressure under control. In this way cardiovascular and pulmonary diseases as well as diabetes will be much reduced. The incidence of cancer will decline and people will live longer. This should save much money that otherwise is spent for health care.

Important Literature:
1. Social determinants of health: http://www.who.int/social_determinants/en/
2. Adelaide Statement on Health Policies: http://www.who.int/social_determinants/hiap_statement_who_sa_final.pdf

4. Patient-oriented-medicine and technique-oriented-medicine

In the past decades the technical sides of medicine have been developed enormously. To day the laboratory can measure and the imaging techniques can show abnormalities that could not be

detected 25 years ago. In addition, surgery has made tremendous progress. Many operations have become minimal invasive thereby leading to a much easier postoperative course. Other surgical procedures have allowed approaching problems that were insoluble in the past. These advances have fascinated the public and have focused medicine on the physical side of human nature. Thereby the public was more and more seduced to believe that modern techniques can solve all health problems, which obviously is not true. This trend has particularly damaged the patient-physician relationship, which was subjected to more and more economic pressures. Consequently, it is about to become suffocated.

The solution to this problem is the separation of health care into two parts, a person-oriented-medicine and a technique-oriented-medicine. In the former the physician is paid in such a way that he obtains sufficient time to interact with the patient. This will allow him to make sure that his patients realize the importance of their personally acquired potential and of their self-responsibility. They are led to the relevant information and are supported to satisfy the demands of their specific condition. The technique-oriented-medicine consists of laboratory, imaging and procedures including surgery. Due to its complexity this aspect of medicine requires a careful team approach and a continuous improvement in quality. The different procedures are well described and may be organized efficiently. Patients in general are assigned a passive role. For this reason the physician-patient-interaction is less important. Consequently, the technique-oriented-medicine may be optimized to achieve high quality at maximal efficiency. These considerations show that the two parts of medicine differ substantially. For these reasons best results and maximal economy may be achieved only, provided the person-oriented and the technique-oriented-medicine are managed each in accordance with their nature[21].

SPECIFIC MEASURES TO BE TAKEN

1. Government

In order to get maximum benefit from the introduction of the Meikirch Model in Orissa, it will be critical that the government as a whole makes and continuously supports the decision to implement it in all departments and at all levels. A concerted effort will make a difference, whereas single measures will have limited effects only. The Meikirch Model is just a concept. For this reason its implementations will necessitate only very modest financial investments. The venture is much more a conceptual one and does not involve equipments or drugs. Once everybody in Orissa knows the Meikirch Model, a culture of health is already introduced. Through continuous support of the concept at all levels, it will be possible to eventually establish such a culture. This will be a major achievement that will greatly contribute to the health and happiness of all people. In addition it certainly will be useful economically at many levels.

For the department of health introduction of the Meikirch Model may be a good occasion to rethink and reorganize some organizational details from the past that are due to be updated.

Departments that should become active are those concerned with health, education, and public information. If they support the Meikirch Model with conviction, the drop down process will be effective. All other parts of the government should inform and teach their co-workers for their own benefit. Perhaps initiatives may also be taken to inform the private sector.

It should be noted, that understanding of the Meikirch Model requires a level of abstraction, which may be difficult for people with little schooling. The concept of a “potential” is not so easy to grasp. It is used to express the current and all future abilities of a particular individual. In the NYSASDRI concept this idea has been simplified to mean only the current abilities or capabilities. It is important to get experience with the two ways to express the concept of health.

The department of health may support hospitals to recognize their opportunities by differentiating their services toward a person-oriented and technique-oriented medicine (see www.psim.ch postulate 6 and 7). Perhaps reimbursement systems for hospitals and private physicians may be used to support this evolution. The Meikirch Model may also be useful to reduce moral hazard.

The departments of health and education may become active in designing posters, leaflets and booklets which explain what health is and what one can do to maintain one’s health. Material designed to teach about specific diseases will also be needed and should be expressed with the criteria of the Meikirch Model. In this context a narrative approach is particularly valuable. It might be good if artists and writers could contribute pictures and stories. Several proposals are collected in the appendix to this manual. They should, however, be improved in style and wording to be suitable for the inhabitants of Orissa.

2. Hospitals

The staff of hospitals should become acquainted with the Meikirch-Model initially for their own benefit and then to teach patients and relatives. Posters explaining health (see attachments) might be hanging at the walls of rooms and corridors. They may be used as opportunities to teach patients and relatives.

Physicians might consider how they can increase the support for the personally acquired potential of their patients. Perhaps it might be purposeful to specialize in the direction of a person-oriented-medicine and of a technique-oriented-medicine (see above and Implementation of the Meikirch

Model 2.4. and www.psim.ch postulate 6 and 7). Practicality of this idea for Orissa will have to be tested and gradually developed in each institution.

3. Physicians in private practice

In general physicians in private practice do their best for their patients. Yet, in their practice they tend to face obstacles. Among them the reimbursement system is a very strong incentive to adjust the practice. This may or may not be in the best interest of patients. Yet, many physicians give services also when they are not paid, but there are limitations to how much they can offer. Once practitioners are convinced that the Meikirch Model helps them to take better care of their patients, they will cooperate with corresponding administrative changes. They may even take the initiative to reduce limitations by administrative hurdles. To achieve this, a very delicate interaction between the organization of physicians, hospitals and the government is needed. If guided properly, it could change medicine in a way that strongly supports the personally acquired potential of all patients. This would be particularly useful for the control and treatment of non-communicable diseases as suggested by the UN in September 2011.

Physicians in private practice should be able to benefit from the use of posters about the Meikirch Model or the NYSASDRI concept of health and from leaflets, which explain different diseases in such a way that patients have the full information about their condition. This will help physicians to fulfil the conditions of the Antonovsky concept: Patients must understand their disease as described in the leaflets, they must be able to manage their condition, and they must find purpose or meaning in taking good care of themselves. (See the NYSASDRI concept “Head, Hand, and Heart” in appendix 2)

4. Health stations

This is the place, where an important part of health care occurs, particularly for people living far from the cities. Many of them are illiterate. They are in great need to get a better understanding of the nature of health. For this reason posters are needed, which are suitable to explain how diseases occur and what patients and their relatives can do themselves to prevent them. They also should become aware of the importance of the personally acquired potential and of self-responsibility. Posters such as the NYSASADRI concept of health, the NYSASDRI concept of “Head, Hand, and Heart”, and the NYSASDRI concept of positivity might be useful. For those who can read, leaflets about frequent diseases will be most helpful.

5. Education

In order to establish a culture of health, people need to know how health is composed of several components. Teaching must start in kindergarten and then continue at all levels including universities. Obviously the teaching material has to be adapted to the age of the children and students. Support by artists will be most useful to create the material. Since health is an essential resource for the economy of a country, this type of teaching will be a worthwhile investment. Obviously the Meikirch Model will be part of the content to be taught. Yet, more emphasis on disease prevention in a wider sense will also be important to fulfil the requirements of the Antonovsky concept.

6. Mass Media

Today radio, television, and newspapers are consumed in large amounts. These media should specifically be stimulated to educate about health. They would be particularly apt to teach stories of patients with different diseases. Mass media tend to bring reports, which are unusual and to neglect

what is happening every day. Yet, it would be particularly useful to instruct the population about common diseases and how to prevent and to treat them. Teaching about the Meikirch Model could be the centre. The long range idea is again to contribute to the establishment of the culture of health. Care should be taken to correct all advertisements to make sure that they agree with the Meikirch Model.

ATTACHMENTS

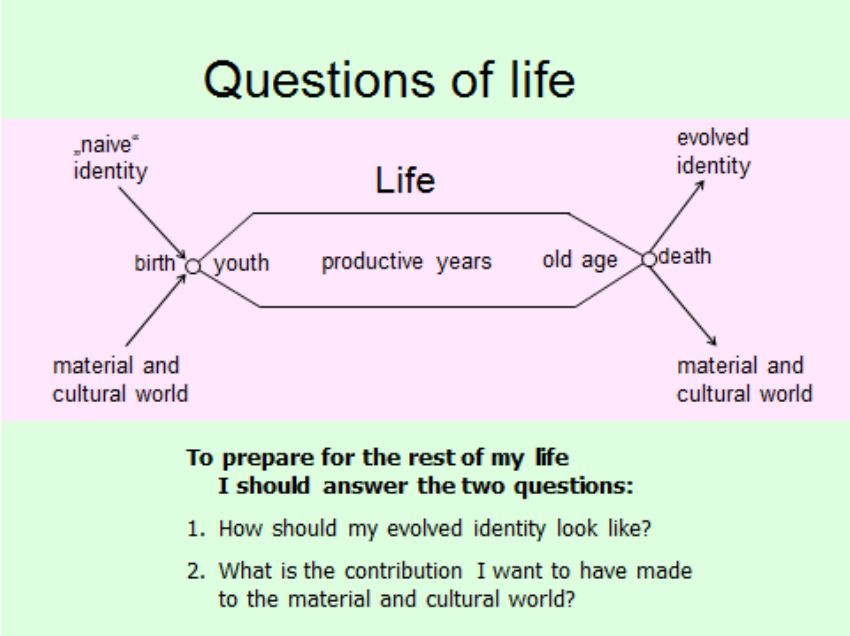
(All attachments may be copied from the website www.psim.ch and freely used.)

1. Health has a purpose. Why do we need health?

The purpose of health is to give each individual the opportunity to respond to the two essential questions of life. The figure gives an idea about the nature of life. At birth an undeveloped or "naïve" identity combines with the material and cultural world of that time and place. The arising individual goes through a stage of youth, followed by productive years and often a stage of old age. At the time of death the identity of the individual has gone through an evolution as a result of reflections, decisions and experiences. At the end this evolved identity separates itself from the material and cultural world. From these basic facts of life results that every person has - throughout his life - to decide what he wants to achieve. For this purpose he has to answer the following two questions:

1. At the end of my life, how should my evolved identity look like?
2. At the end of my life, what will I have contributed to the material and cultural world?

The purpose of health is to give each individual a life sufficiently long and with sufficient abilities to allow him to truly evolve in agreement with the answers he has given to the two questions. Interestingly, human beings live longer, if they have reflected about these questions repeatedly and in sufficient depth.

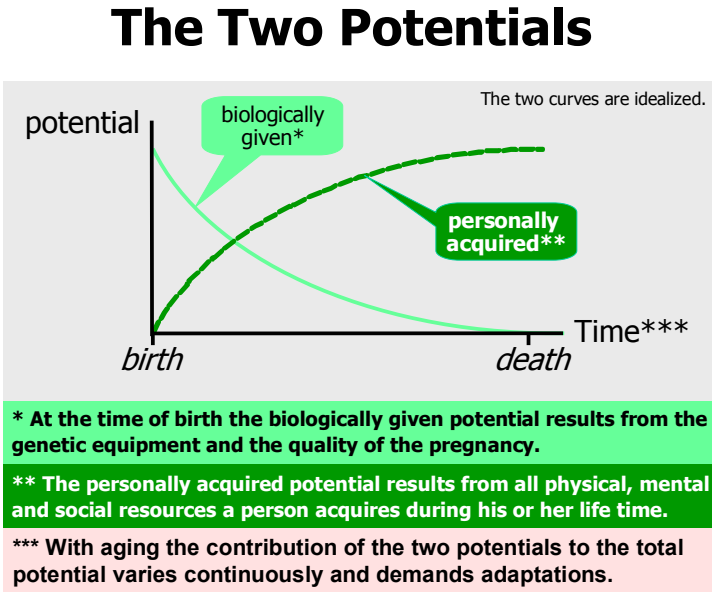


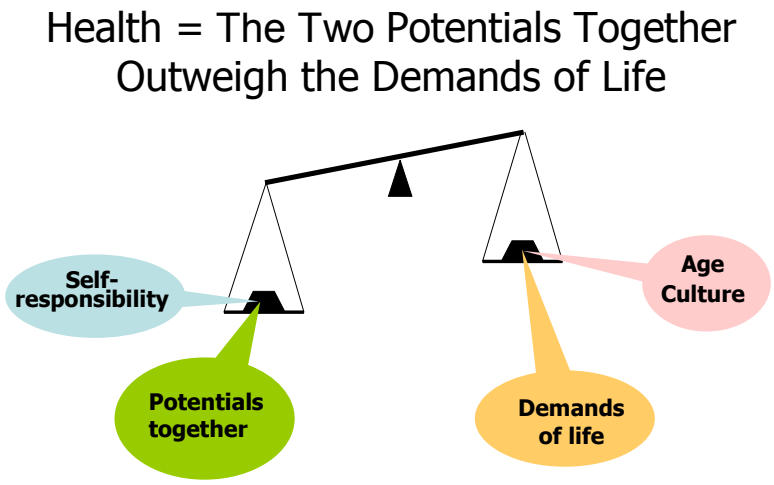
2. The three essential elements of health

Demands of Life	Biologically given potential	Personally acquired potential
• Production of food • Protection • Meaningful human relationships • Rearing of children • Waste disposal	• Is the result of the genetic equipment and the quality of the pregnancy. • Needs careful protection throughout the entire life	• Babies need to learn to sit, to stand and to walk, etc. • Acquisition of immunities • Lifelong cultivation of needed and useful knowledge, skills and attitudes

3. Pictures to illustrate the Meikirch Model

The following two pictures may be used in explanations of the Meikirch Model. They illustrate the time course of the two potentials throughout life and the concept that in health the two potentials together must outweigh the demands of life.





4. NYSASDRI concept of health I

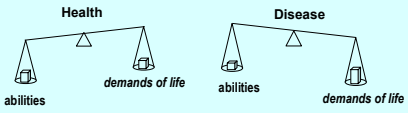
These eight pictures are a PowerPoint presentation, which describes in simple terms, what health is. Instead of the term potential the word abilities is used. This makes the concept easier to grasp. The pictures can be translated and transformed into one or two posters. It would be wise to ask an artist to choose appropriate pictures for each text. The presentation is just an example for what can be done. It should be adapted to suit the culture of Orissa.

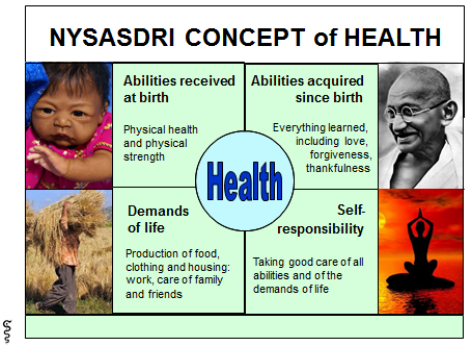
NYSASDRI CONCEPT of HEALTH

1. Each human being must learn how to lead a healthy life. The NYSASDRI concept of health is designed to help each person to achieve a maximum state of health.
2. Health is both a gift of nature and personal responsibility. To live a healthy life, all aspects of health need to be considered.

What is Health?

"Health is a state of wellbeing that results when the abilities of a person are more effective than the demands of life, taking age, culture, and personal responsibility into consideration. Disease is the state when the abilities are less effective than the demands of life."





Abilities Received at Birth

Physical health needs to be protected:

1. Adequate nutrition: Healthy diet with little salt
2. Infections: Personal hygiene, malaria, food borne infections, sexual diseases, etc.
3. Toxins: alcohol, smoking, chemicals at work, etc.
4. Accidents: safety at work, safety on the road, etc.
5. A good amount of physical activity keeps the body healthy. Laziness and stressful efforts are to be avoided.

Abilities Acquired since Birth

Everything learned including love, forgiveness and thankfulness

1. Physical abilities: running, swimming, bicycling, etc.
2. Intellectual abilities: everything learned at school, reading, writing, mathematics, business, history, etc.
3. Character: truthfulness, honesty, respect, love, forgiveness and thankfulness*.

* Cultivating gratitude alone may prolong life for many years.

Demands of Life

Production of food, clothing and housing: work, care of family and friends

1. Since the onset of mankind, humans had to work to be able to survive and to raise children. That is normal and generally must be fulfilled.
2. Working conditions may be demanding, but they must not endanger or overburden a person.
3. To provide for children is fulfilling.

Self-responsibility

Take good care of all abilities and the demands of life

1. Humans are responsible to manage their physical health: Good cooperation with health stations and doctors is required.
2. Humans need to continuously acquire new abilities for their physical body, their thinking and their loving including forgiveness. Standstill is loss.
3. Humans must continuously try to respond better to the demands of life.

Compatibility with age and culture

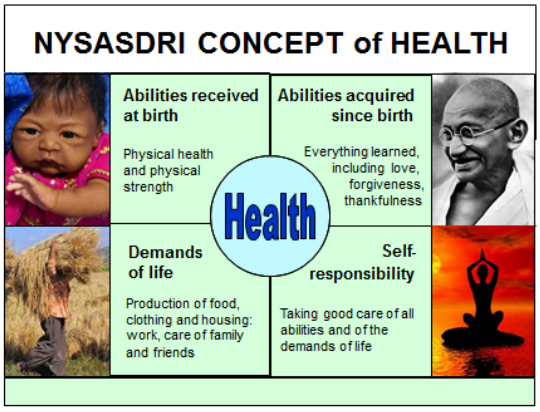
Demands and possibilities vary from person to person.

1. In each age group there are different needs and possibilities. They must be respected.
2. Different cultures fulfill similar tasks differently. Each of them is to be respected.
3. The society must take responsibility to tailor its demands to the abilities of the people. This postulate also is to be respected by employers.

5. NYSASDRI concept of health II

To remain healthy it is not sufficient to take good care of one's body. In contrast, it is critical to keep the following four aspects in balance while taking age and culture into consideration:

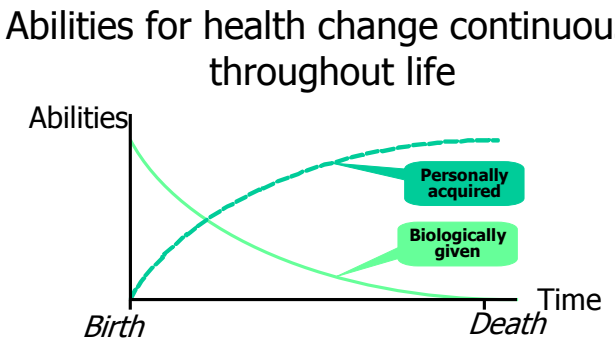
1. The abilities given at birth have to be carefully preserved.
2. The abilities acquired since birth have to continuously be developed further.
3. The demands of life must not overburden the two abilities.
4. Each person must assume responsibility for the first three aspects.



1. For the large majority of persons the abilities given at birth are a great gift. Everybody has to carefully preserve this gift. Rare individuals suffer of disabilities since birth. They require due assistance.
2. Humans have to learn continuously during the whole life. This includes e.g. the upright gait at the age of about one year and all subsequent physical abilities. It involves also everything one can learn in school and later. Interestingly for health it also is important to learn love, forgiveness and thankfulness. All these abilities contribute to health.
3. Everybody is exposed to the demands of life. We can influence these demands to some extent by making wise choices. The demands may challenge but must not overburden our abilities.
4. It is the responsibility of every person to take good care of the abilities given at birth and to care for a continuous increase of the acquired abilities. The responsibility also extends to the question how each person exposes him- or herself to the demands of life.
5. All these aspects vary with age and culture. Therefore age and culture have to be taken into consideration.

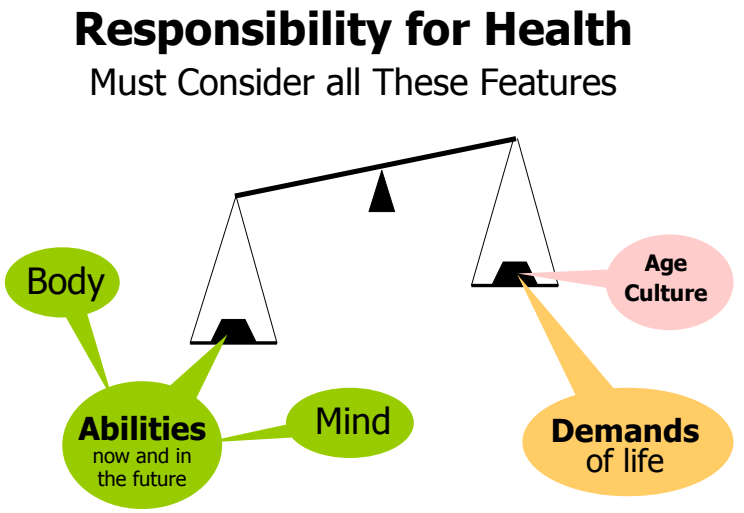
6. Pictures to further illustrate the NYSASDRI concept of health

In the NYSASDR concept of health the curves of the abilities evolve throughout life.



The biologically given abilities diminish progressively, whereas the personally acquired abilities may increase. Yet, they do this, only if they are cared for. With aging the contribution of the two potentials to the total potential varies continuously and demands adaptations.

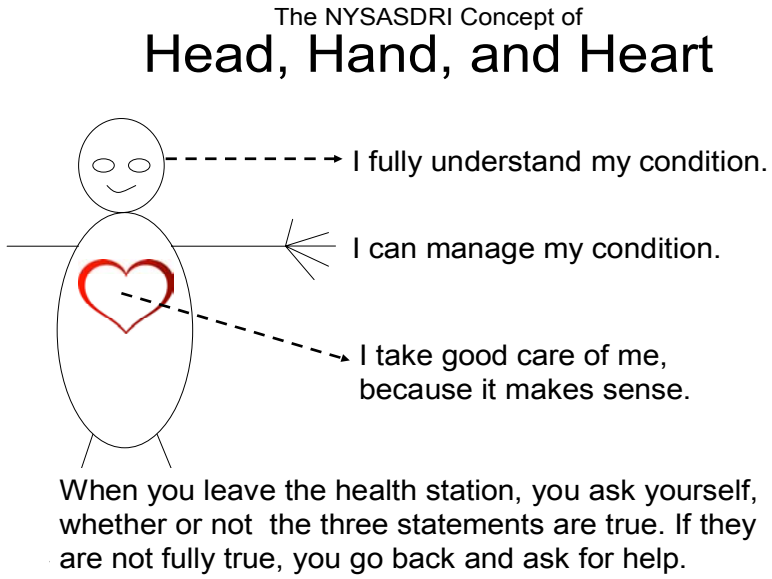
NYSASDRI concept of health



NYSASDRI concept of health

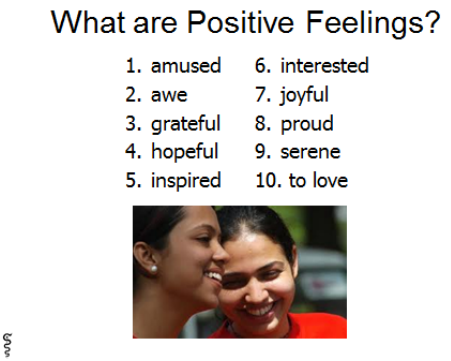
7. The NYSASDRI concept of head, hand, and heart

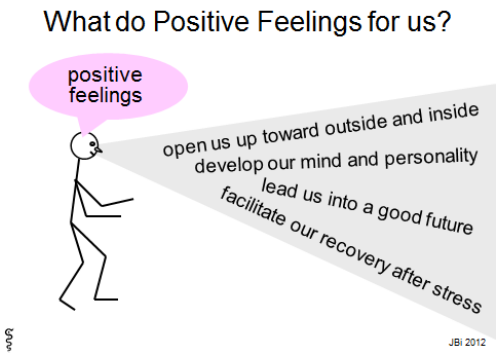
The NYSASRI concept of "Head, Hand, and Heart" is an application of the salutogenesis concept of Antonovsky (see chapter 2.2). His sense of coherence, which leads toward health, is composed of three components: The patient must understand his situation, he must be able to manage it, and he must find meaning or purpose in taking good care of himself. (This picture can e.g. be realized as poster in health stations.)

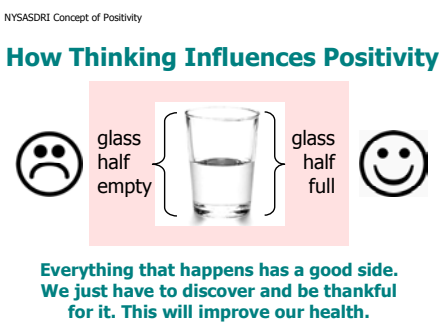


8. The NYSASDRI concept of positivity

People with many positive feelings live longer. This is the basis for the NYSASDRI concept of positivity. Everybody can increase the number of his positive feelings by applying simple rules as shown below. In addition positivity can be increased by daily meditation. This is documented scientifically. These pictures may be used to create a poster.

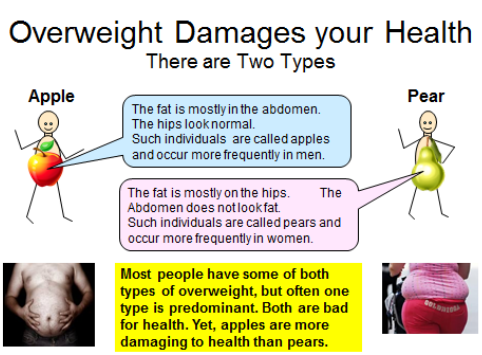


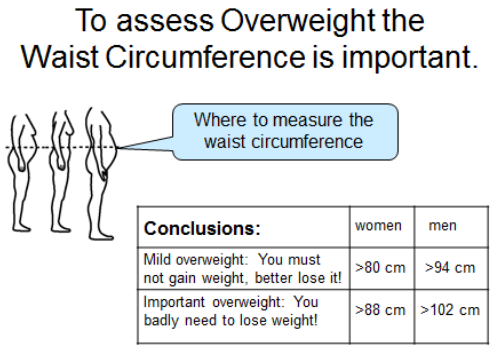




9. Overweight: What is it and how can we keep the weight normal?

When overweight arises, there is no pain and no feeling of ill health. Diseases come much later and often result in a state of health that is very difficult to tolerate. Some of the symptoms may be back aches, osteoarthritis of the knees, sugar diabetes, blindness, pains, heart attacks, strokes, etc. The second half of the life is much easier, if overweight is avoided.





Overweight is a Silent Killer!

1. In the beginning most people do not feel anything. Yet, after some or many years bad diseases are sure.
2. Overweight tends to produce diabetes and all its very bad consequences, such as heart attacks, strokes, kidney disease, blindness, painful nerve diseases, etc.
3. Overweight damages blood vessels and leads to heart attacks, strokes, insufficient circulation in the legs, etc.
4. Overweight may result in gall stones and cancers.
5. Overweight overburdens the bones and articulations. The spine and knees suffer most. Bad pains result!
6. Early weight loss prevents all these diseases.

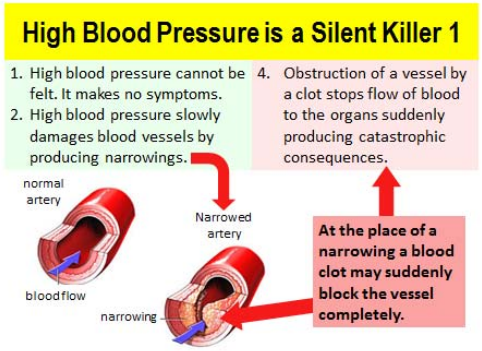
Seven Rules to Lose Weight

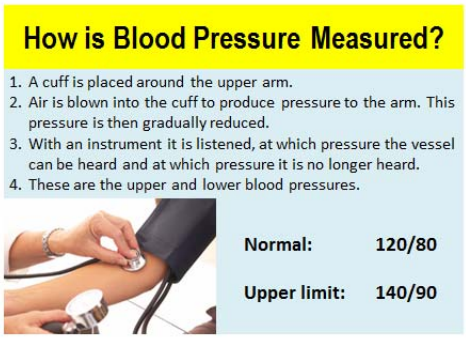
1. The family must know, that you want to lose weight.
2. Eat ordinary food. Diets are not better.
3. Eat three meals a day with attention and mindfulness.
4. At each meal take a single small serving only and allow no exceptions. Take no food between meals.
5. Enjoy your food. Eat slowly. Take small bites and chew them at length. Be the last to finish your serving.
6. If the stomach is not satisfied at the end of the meal, wait 15 minutes, because then it will be satisfied.
7. To set up a new habit takes 1 to 2 months. Once it is established, it will be easy and weight loss certain.

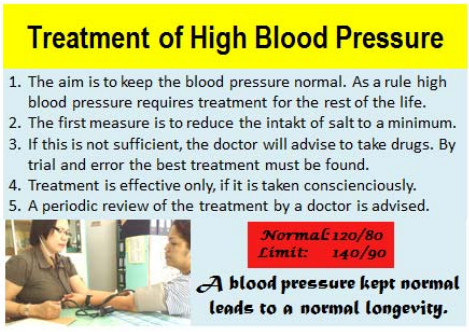
10. Beware: High blood pressure is a silent killer.

High blood pressure occurs in all countries of the world. Yet, it cannot be taken lightly!

- ***The good message:*** The person does not feel it, because high blood pressure creates no pain or other discomfort.
- ***The bad message:*** High blood pressure slowly and gradually damages the blood vessels. Once such a vessel is obstructed, bad consequences result suddenly, e.g. a heart attack, a stroke, or kidney failure.
- ***The good message:*** Damage to blood vessels can be prevented, if the blood pressure is kept normal by drug treatment. Together with his physician every patient can achieve this goal, if he takes good care of himself.
- ***The bad message:*** Once a heart attack, a stroke or kidney failure has occurred, most of the time only a partial cure can be achieved. Unfortunately often the outcome is fatal after some time.
- ***The good message:*** The blood pressure can be measured easily. Everybody can check his own blood pressure from time to time and make sure that his blood pressure is normal.







11. EFT, Emotional Freedom Technique (www.eftuniverse.com)

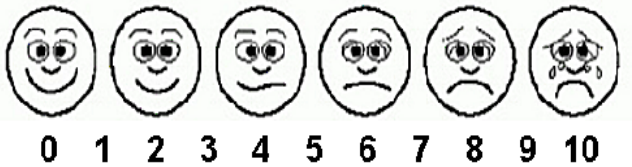
Background

EFT, as developed by Gary Craig, is a new method that is able to relieve us from burdensome emotions. Recently, it has been recognized by the American Psychological Association as a psychologically effective therapy[22]. It combines elements of psychology with the tapping of acupuncture points. In many cases EFT works within minutes and the results are sustained. In other cases relief from burdensome emotions requires larger efforts. Nevertheless, they are less demanding and less painful than ordinary psychotherapy. A specific advantage of EFT is that the basic rules are easy to learn and can be applied by oneself. Obviously, there are also limitations. They are mostly related to the fact that it may be difficult to detect the background of one's own emotions. In such situations collaboration with a certified EFT therapist will be helpful. Today it is possible to do EFT with a therapist by Skype or by telephone.

The mechanism of action of EFT is thought to be as follows: A remembered thought or feeling is quite stable as long as it is stored in our brain. As soon as we mobilize it by taking it up again in our consciousness it becomes unstable and may be changed. By tapping acupuncture points the limbic system, where conscious emotions are located in the brain, is calmed. This reduces the intensity of the emotion. When thereafter this emotion is again stored in our memory, it is retained in its new form. This is how humans can be relieved from even overwhelming emotions.

Principles for using EFT

1. The essence of EFT consists of a basic recipe and some general principles for its application.
2. As a general rule the basic recipe relieves troubling emotions, yet, in most cases, only for some time.
3. Emotions, which can be traced to specific events, tend to respond very well and with sustained effects. It is important to know, however, that a presently troubling emotion may be evoked by several past events. In that case each of these events has resulted in a specific aspect of the feelings and each needs to be treated separately.
4. One secret for the success of EFT consists in the testing of the intensity of the emotion before and after each application of the basic recipe (see below). For this purpose the person to be treated has to grade the emotion in subjective units of distress (SUD) on a scale from zero to 10. Zero means no and 10 means maximal, unbearable emotion or pain. In this way it is possible to verify whether or not the basic recipe has reduced the intensity. The following smiley faces may be illustrate the SUD:



5. When the basic recipe has reduced the severity of an emotion, it may be repeated, referring in the set-up phrase to the "remaining emotion" or "remaining pain".
6. EFT may be applied to all emotional problems. It may also be purposeful to use EFT for somatic symptoms because many of them may be aggravated by emotional components. Examples are headache, back ache, stiff neck, abdominal cramps, etc.

Basic Recipe

1. ***Naming the emotion:*** Initially the burdensome emotion needs to be named. Ideally it has its origin in a specific event, for which place, time, and involved persons may be enumerated. General emotions such as fatigue, nervous tension, or sadness respond less well.
2. ***Intensity of the emotion:*** The intensity of the specific emotion to be treated is graded from zero to 10 and recorded in a minute.
3. ***Set-up:*** The person to be treated repeats three times at full voice: "Even though I have this ……., I deeply and completely accept myself." While saying the set-up phrase the *Karate chop point* is tapped or the *sore spot* rubbed continuously. This sore spot has to be looked for between the second and third rib somewhere 7 to 9 cm to the left or the right of the midline. When rubbing it, it should be slightly sore. One has to search until the spot is found.
4. ***Sequence:*** The volunteer taps about 7 times on each of the points from 1 to 13 (see below) and repeats each time the reminder phrase, which names the burdensome emotion. He or she should try to stay within this emotion during the procedure.
5. ***9-Gamut procedure***: see below
6. ***Sequence*** as above repeating the same reminder phrase (as given in point 4)
7. ***Intensity of the emotion:*** The treated emotion is again named and the intensity graded on the scale from 0 to 10 and again recorded.

Sequence:

The following 13 points are tapped on the right or the left side (as is done best):

1. Beginning of the eye brows (eye brows: EB)
2. Bone bordering the outside corner of the eye (side of eye: SE).
3. Bone under an eye (under the eye: UE)
4. Between nose and upper lip (under the nose: UN)
5. Between lower lip and chin (chin: CH)
6. Central end of the collar bone (collar bone: CB)
7. Under the arm about 10 cm below the armpit (under the arm: UA)
8. Below nipple: 3 cm for men and where the skin of the breast meets the chest for women: (below nipple: BN)
9. Outer side of the thumb at the level of the base of the nail (thumb: TH)
10. Side of index finger facing the thumb, analogous to thumb (index finger IF)
11. Side of middle finger analogous to thumb (middle finger: MF)
12. Side of baby finger analogous to thumb (baby finger: BF)
13. Karate chop point (karate chop: KC)

9-Gamut Procedure

The volunteer continuously taps the gamut point throughout the procedure. The point is located 2 to 3 cm behind the midpoint between the knuckles at the base of the ring and the little finger. The head is kept steady, while performing the following actions:

1. Eyes closed
2. Eyes open
3. Eyes hard down right
4. Eyes hard down left
5. Roll eyes in a circle 360^{o} to the right
6. Roll eyes in a circle 360^{o} to th
7. e left
8. Hum 2 seconds of a song (e.g. happy birthday)
9. Count from 1 to 5
10. Hum 2 seconds of a song again (e.g. happy birthday)

Some explanations:

- The set-up phrase serves to counteract the so called psychological reversal (not explained). In acute conditions the psychological reversal is present in about 40% and in chronic conditions in almost 100% of cases.
- The 9-gamut procedure non-specifically strengthens the effects of the basic recipe.
- The basic recipe is never wrong. It may, however, be simplified in some cases, e.g. the points 8 to 13 and the 9-gamut procedure may be omitted, provided the severity of the emotion falls without them.

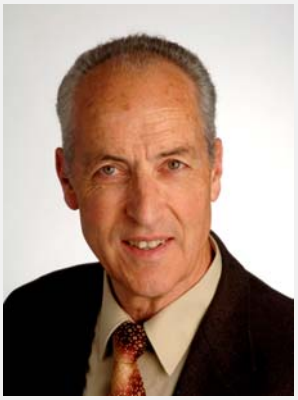
Some strategic principles

1. In a general way EFT relieves emotions. This may, however be transient only and sustainable relief may require much persistence. Repeated tapping for a long time may be needed.
2. Most emotions, which can be traced to a specific event, respond to EFT very well and the response tends to be sustained. Frequently, however, a burdensome emotion is related to several specific events of the past. Alternatively, a single event has stirred up several different emotions. All of them are called aspects and need to be treated separately.
3. A specific event is treated as if it would be a short movie of some minutes. This movie is given a title. Then it is allowed to proceed until the emotional climax is reached. This then is the moment of treatment. If the event is very disturbing, it is purposeful to treat first the title of the movie. Only when the intensity of the title is at a low intensity, the climax is treated.
4. The secret of the success of EFT lies in the testing of the intensity of suffering with the help of the SUD after each round of tapping. With this method it is possible to evaluate, whether or not the chosen path is successful. Ideally the set-up phrase and the SUD before and after each tapping round are recorded in a minute.
5. If a round of tapping has reduced the SUD to some degree, more rounds are added until the SUD is zero. In this case the set-up phrase is changed in the following way: Although a rest of …. is still disturbing me, …….. Even if the SUD falls slowly only, it is purposeful to continue with more rounds of tapping. A dozen times is no exaggeration.
6. If the SUD remains unchanged or even increases, the following possibilities need to be considered:
   - Perhaps the set-up was insufficient. It then needs to be repeated loud and with much emphasis.
   - If the SUD remains unchanged, the burdensome emotion may be composed of several aspects, all of which need to be treated separately. By careful questioning they may be discovered and then treated. Ideally for each aspect specific events are searched for.
   - If the SUD increases, very often a new intense emotion can be detected. Obviously, it needs to be treated as above.
7. Often it is difficult to remember past specific events. In this case an event may be invented. If the subject is repeatedly asked, how it could have been, a short movie may be reconstructed including place, time, involved persons, and action.

Personal Peace Process

Principle: There is the idea to liberate oneself from all burdensome and troubling emotions in order to live a peaceful life and to utilize one's own emotional abilities creatively. Experience has shown that in most humans about 150 to 300 burdensome and troubling emotions may be found. The purpose of the personal peace process is to treat all of them.

Procedure: Initially a list of all burden- and troublesome emotions and specific events is made. Their severity is graded from zero to 10 and they are prioritized. This list is continuously updated by all later appearing problems and again prioritized if needed. Thereafter 3 to 5 of the most burdensome emotions are treated with the basic recipe until they are at zero. Obviously the relevant methodological details have to be respected. Even when in a specific problem the response is not satisfactory (i.e. not zero), the desired solution may be achieved in time by working on the problem with sufficient persistence. When this is not possible, a certified EFT therapist may be consulted.



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Curriculum Vitae

1933	born in Zurich, Switzerland
1952 - 1958	Medical School at the Universities of Lausanne, Munich and Zürich
1959 - 1968	Rotating Internship in Trenton, N.J, Training in Internal Medicine and Gastroenterology at the Mayo Clinic and the University Hospital of Zurich
1969 - 1973	Junior Consultant Dept. of Clinical Pharmacology, University of Bern
1974 - 1975	Medical Director and Head of Department of Internal Medicine, Black Lion Hospital, Addis Ababa, Ethiopia
1975 - 1984	Associate Professor, Department of Clinical Pharmacology, University of Bern
1984 - 1989	Full Professor, Department of Clinical Pharmacology, University of Göttingen, Germany
1989 - 1997	Dean Faculty of Medicine, University of Witten/Herdecke, Germany
1997 - 1998	Guest Professor University of Leuven, Belgium
1999 - 2000	Medical Director, University Hospital, Bern
1999 - 2004	Project about the Future of Medicine, Swiss Academy of Medical Sciences
as of 2004	Honorary Member of the Swiss Academy of Medical Sciences

2012-05-09

1. Particulars

Name	BIRCHER
First name	Johannes
Date of birth	July 6, 1933
Place of origin	Zürich and Küttigen AG
Nationality	Swiss
Marital status	married December 10, 1960 with Ursula Magdalena
Children	Bettina 1962
	Katharina 1964
	Barbara 1967
Home address	Reuelweg 20
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Web site	www.psim.ch

2. Professional Formation and Development

1946 - 1952	Freies Gymnasium, Zürich. Swiss-Federal Maturity.
1953 - 1958	Medical School in Zürich, Lausanne and Munich:
	Federal Examination December 1958.
1959	Thesis, University of Zürich: Indikation zur Operation bei doppelseitiger Nephrolithiasis.
24.10.1959 - 24.10.1969	Internship Mercer Hospital, Trenton, N.J., USA. Exchange Program of Dr. H. Read.
01.01.1961 - 31.12.1963	Fellow in Internal Medicine, Mayo Clinic, Rochester, Minnesota, USA.
01.04.1964 - 30.09.1966	Resident Physician, Department of Internal Medicine, University Hospital, University of Zürich.
01.10.1966 - 30.09.1967	Resident Physician, Department of Diagnostic Radiology, University Hospital, University of Zürich.
01.10.1967 - 30.09.1968	Resident in Gastroenterology, Department of Internal Medicine, University Hospital, University of Zürich.
01.01.1969 - 31.12.1973	Consultant Physician and Senior Investigator, Dpt. of Clinical Pharmacology, University of Berne.
01.01.1974 - 30.04.1975	Medical Director and Chief of Internal Medicine, Duke

	of Harrar Memorial Hospital Addis Ababa. Honorary Associate Professor, Haile Selassie I University, Addis Ababa. (Project for technical cooperation of the University of Berne, Switzerland).
01.05.1975 - 31.09.1979	Head of Division, Department of Clinical Pharmacology, University of Berne.
01.10.1979 - 31.05.1984	Deputy Director of the Department of Clinical Pharmacology, University of Berne.
01.06.1984 - 30.09.1989	Director, Division of Clinical Pharmacology, University of Göttingen, Germany.
01.04.1987 - 31.03.1989	Managing Director of the Centre of Pharmacology and Toxicology, University of Göttingen.
01.10.1989 - 31.03.1997	Dean, Medical Faculty, University of Witten/Herdecke.
As of 01.04.1997	Retirement
01.10.1997 – 31.03.1998	Visiting Professor, Faculty of Medicine, Katholike Universiteit Leuven, Belgium.
01.10.1998 – 31.12.2010	Emeritus Professor, Dpt.of Clinical Pharmacology, University of Bern, Switzerland.
01.04.1999 – 31.12.2000	Medical Director, Inselspital, (University Hospital) Bern
As of 01.01 2011	Emeritus Professor, Department of Hepatology, University of Bern, Switzerland.

3. Qualifications

22.02.1961	M.D., University of Zürich.
14.12.1963	Master of Science in Medicine, University of Minnesota, Minneapolis, Minn., USA.
23.08.1968	Board Qualifications for Internal Medicine and Gastroenterology, Switzerland.
17.07.1972	Assistant Professor in Clinical Pharmacology and Gastroenterology, Medical Faculty, University of Berne.

01.10.1979	Associate Professor, University of Berne (Nebenamtliches Extraordinariat).
01.04.1981	Associate Professor with tenure, University of Berne (Vollamtliches Extraordinariat).
01.06.1984	Full Professor of Clinical Pharmacology, University of Göttingen.
01.10.1989	University Professor of Clinical Pharmacology and Internal Medicine, University of Witten/Herdecke.

4. Awards

24.05.1963	Postgraduate Medical Travel Award for high achievement as a fellow in medicine of the Mayo Foundation, Rochester, Minn., USA.
08.09.1971 for 1971.	Heinz-Kalk-Prize of the Liver, Symposium in Vulpera for the publication: Treatment of chronic portal-systemic encephalopathy with lactulose. Am J Med 51:148,
24.09.1976 of transport Clin	Prize of the Swiss Society for Gastroenterology for the publication: A new look at the plasma disappearance of sulfobromophthalein. Correlation with the BSP maximum and the hepatic plasma flow in man. J Lab Med 88:1019-1031, 1976.
16.12.1989 Study	Görlich-Prize to the Swiss Working Group for the of Echinococcosis. Coordinators: A. Akovbiantz MD, E. Eckert PhD, J. Bircher MD.

5. Responsibilities in Scientific Societies and Committees

1971 - 1972	Swiss Society for Gastroenterology: Secretary.
1973 - 1981	Swiss Federal Office for Social Security: Member of Drug Committee.
01.04.1976 - 31.05.1984 Switzerland:	Intercantonal Office for Drug Regulation in

	Member of the Expert Committee.
1981 - 1983	Founder-President of the Section of Clinical Pharmacology of the Swiss Society for Pharmacology and Toxicology.
1982 - 1990 for	Secretary/Treasurer of the International Association the Study of the Liver (IASL).
1983/1984	President of the European Association for the Study of the Liver (EASL).
1989	Founding Member and Vice-President of the German Association of Physicians of Clinical Pharmacology.
As of 2003 Sciences.	Honorary Member Swiss Academy of Medical

6. Publications

-Original articles in refernced journals: 129
-Reviews, editorials, letters to the editors etc. 119
-Books: 7 (among them the Oxfort Textbook of Clinical Hepatology)

7. Editorial work

1. Reviews of scientific papers for:

- Archives Francaises des Maladies de l'Appareil Digestif
- Archives Internationales de Pharmacodynamie et de Therapie (Schriftleitung)
- Biologie et Gastroenterologie
- Digestion
- Digestive Disease and Science
- European Journal of Clinical Investigation
- European Journal of Clinical Pharmacology
- Experientia
- Gastroenterology
- Hepatology
- Journal of Hepatology
- Journal of Laboratory and Clinical Medicine
- Schweizerische Medizinische Wochenschrift

2. Editor and Associate Editor:
- Lymphology 1967 - 1973
- Gastroenterologie Biologique et Clinique, 1987 - 1990
- Hepatology, in 1988/89
-Journal of Hepatology, 1989 – 1994
-European Journal of Clinical Pharmacology 1982 1990

Publications of Johannes Bircher MD

He has published 129 original research articles, 200 review and teaching articles, and 6 books.
He has lectured in German and English in many renowned Organizations and was member of many scientific and professional associations. His activities for the Meikirch Model are summarized in www.psim.ch

Selected Original Research Publications

1. Bircher J, Müller J, Guggenheim P, Haemmerli UP (1966) Treatment of chronic portal-systemic encephalopathy with lactulose. Lancet 1:890-893.

2. Bircher J, Haemmerli UP, Müller-Duysing W, Bally G, Haemmerli G, Hoffmann K (1970) The mechanism of action of lactulose in portal-systemic encephalopathy: Colonic bacterial urease activity and bacterial flora in rats. Rev Europ Etudes Clin Biol 15:1096-1100.

3. Bircher J, Haemmerli UP, Trabert E, Largiader F, Mocetti T (1971) The mechanism of action of lactulose in portal-systemic encephalopathy. Non-ionic diffusion of ammonia in the canine colon. Rev Europ Etudes Clin Biol 16:352-357.

4. Bircher J, Haemmerli UP, Scollo-Lavizzari G, Hoffmann K (1971) Treatment of chronic portal-systemic encephalopathy with lactulose. Am J Med 51:148-159.

5. Herz R, Sautter V, Robert F, Bircher J (1972) The Eck fistula rat: Definition of an experimental model. Eur J Clin Invest 2:390-397.

6. Herz R, Sautter V, Bircher J (1972) Fortuitous discovery of urate nephrolithiasis in rats subjected to portacaval anastomosis. Experientia 28:27-28.

7. Bircher J, Paumgartner G, Cueni B, Herz R, Preisig R (1973) The significance of liver volume in patients with cirrhosis. In "The Liver. Quantitative Aspects of Structure and Function", Karger Verlag, Basel, pp 87-94.

8. Lauterburg BH, Bircher J (1976) Expiratory measurement of maximal aminopyrine demethylation in vivo: Effect of phenobarbital, partial hepatectomy, portacaval shunt and bile duct ligation in the rat. J Pharmacol Exp Ther 196:501-509.

9. Häcki W, Bircher J, Preisig R (1976) A new look at the plasma disappearance of sulfobromophthalein (BSP). Correlation with the BSP transport maximum and the hepatic plasma flow in man. J Lab Clin Med 88:1019-1031.

10. Bircher J, Küpfer A, Gikalov I, Preisig R (1976) Aminopyrine demethylation measured by breath analysis in cirrhosis. Clin Pharmacol Ther 20:484-492.

11. Lauterburg B, Sautter V, Herz R, Colombo JP, Roch-Ramel F, Bircher J (1977) The defect of uric acid metabolism in Eck fistula rats. J Lab Clin Med 90:92-100.

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