# Health care paradigms in transition

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*A.A. Franco, H. Bouma, J.E.M.H. van Bronswijk. Health care paradigms in transition. Gerontechnology 2014;13(1):5-10;* doi:10.4017/gt.2014.13.1.001.00 Given the current state of the welfare state, rethinking the prevailing health care paradigm is important as health care services try to adapt to the demographic, economic, political, environmental transformation, and rapid technological innovation. The basic focus of the medical paradigm is fundamentally unchanged since the time of Hippocrates: disease management driven mainly by the curative treatment. This paper argues that a new paradigm of 'functional health' is now beginning to emerge. Its starting point is not disease and treatment, but rather a person's functional ability. This approach accords the individual a more central role as the person often best aware of his or her functional limitations. Although the health professionals remain in charge of acute and life threatening situations, when it comes to functional ability, the health professional acts as a counselor or facilitator. In terms of the World Health Organisation (WHO) classifications, this corresponds to a shift from the International Classification of Diseases (ICD), toward the International Classification of Functioning, Disability and Health (ICF). This new paradigm is potentially sustainable: it can combine simplicity with best quality, cost effectiveness with lack of waste, and use robust new technologies to the utmost. The new paradigm maintains the essence of the Hippocratic paradigm, but broadens the scope to health care issues and health care services so that important theoretical, educational, operational, and economic aspects can be accommodated. This paper looks into the implications of this transition and what can be done to ease the transition of focus from cure to care, from medical health to functional health.

**Key words: health care paradigm, functional health, ICD, ICF, Hippocrates**

A paradigm can be defined as a coherent constellation of beliefs, habits, and procedures for achieving certain goals in society. It is based on habit and tradition, anchored in written laws and unwritten rules, in institutes, companies, and other vested interests, although clear-cut evidence that it constitutes the optimal way to achieve the wanted goals may be lacking. Here paradigms for achieving optimum health care will be considered. For the emerging paradigm shift[1] in the health care sector, technological progress for individual autonomy is an enabling factor, and high quality, cost effectiveness, and sustainability are to be achieved. The economic crisis helps to accelerate the emerging transformation. Let us first consider the classic Hippocratic paradigm.

## Hippocratic or medical health care paradigm

Hippocrates of Kos (460-370 BC) has formulated principles of the health care paradigm that has dominated western medicine ever since and is still being taught by most medical faculties. He introduced the trio (i) diagnosis of disease and establishing the external agent, (ii) disease-specific treatment by erasing the agent by therapeutics, (iii) an implicit privacy contract between patient and physician in which the patient's health is the leading principle and secrecy guaranteed. The Hippocratic model has been worked out for centuries and is currently leading in the World Health Organization International Classification of Diseases ICD, currently in its 10th revision[2].

Gradually, alterations have occurred, challenging or exceeding the paradigm. An important one is that the concept of health has been widened as involving the whole person, not just the absence of disease[3], for example for minimizing disability, keeping up work potential, and social inclusion, thus broadening health care as well. But there are others. Health complaints could not always be traced to one or more specific diseases; these were accommodated by introducing the diagnostic category 'e causa ignota' (cause unknown). More recently, it became unclear if 'ageing' qualified as a cause of disease, since ageing is a natural phenomenon and as such cannot be treated. How to deal with multi-morbidity of chronic diseases so common at old age? Geriatrics and multi-disciplinarity are partly answers to this challenge, often starting with reducing num-

ber and doses of drugs. What about negative side effects of treatments, which may even be worse than the disease symptoms in themselves? How to deal with experimental treatments with uncertain outcomes? How to withstand the pressure by commercial parties who are out to influence beliefs and habits by physicians, not necessarily in the interest of the patients.

And how to position prevention in the Hippocrates scheme, prevention being a powerful tool to improve health, as has been obvious ever since the health engineering revolution focusing on hygiene in the late 19th and first half of the 20th century through providing safe drinking water, disposal of sewage and other waste, and improved indoor conditions[4]? How to accommodate recent rapid technological developments, exemplified by the Internet? And how to maintain privacy when digital patient dossiers become the rule and are available to too many inquisitive eyes such as of health workers, insurance employees and hackers, playful if not malicious?

Gray[5] gives some answers in describing new steps within the global medical paradigm that we name in this paper Hippocratic. First came the effectiveness paradigm boosted by the concept of evidence-based medicine. Then came two steps in the quality and safety paradigms. And finally appears the concept of value in health care, as the proper objective of a care system: patient health outcomes relative to total cost.

This interesting step raises a new question. If medical health has an economic value, who is in charge of making decisions? The clinician mainly dedicated to obtain the best care for his/her personal patient, or the population medicine decision maker? The present paper makes the proposition of a central role for the user/customer/patient/citizen with the following emerging paradigm.

### Functional health paradigm

Although basic elements of the Hippocratic paradigm remain valid, this paradigm has not been able to handle many of the changes of environments, population, demographics, and actors up till the present. Here it will be argued that the Hippocratic model in which disease with diagnosis and treatment is at the centre and the physician has the primary role, is gradually being accompanied by a 'Functional model'. In this model, limitations and restorations of human functions are at the centre. The 'patient' takes on a role as a primary source of information. This also leads to increased autonomy of the patient who, aided by an abundance of current information resources, may take a more active role. This replaces the passive role of the patient in the Hippocrates paradigm. In this way, part of the problems of the Hippocratic paradigm can be solved. This paper has been written from a European perspective, but the gist of the development is thought to be rather universal because both increased longevity and rapid technological innovation are occurring world-wide.

Along with the demographic shift toward increased longevity, many ageing people live for long periods of their lives with one or more chronic diseases, restrained and controlled by medicines. For them, ageing means a decrease in reserve of functioning, with frailty as the situation in which reserves have been exhausted and decompensation has occurred. As to health care, the main goal cannot be to cure every one of their chronic diseases, but rather to maintain autonomy and daily functioning as long as possible with a minimum of restrictions. A recent attempt catches this new spirit by defining a concept called 'positive health' as "the ability to adapt and self-manage one's own life against physical, emotional, and social challenges of life"[6,7]. Health care then is every support for achieving such health. In terms of the functional paradigm: once chronic diseases of the patient are stabilized, the focus is shifting toward optimal daily functioning. The main source of information on functions and limitations of functions is the patient her/himself.

With handicapped persons in mind, the WHO has grasped this emerging shift as early as 1980, distinguishing between (i) impairment of bodily functions, (ii) disability to carry out activities, and (iii) handicap to participate in social life[8]. In 2001 this has resulted in the International Classification of Functioning, Disability and Health ICF[9], with (i) impairments of bodily functions, (ii) limitations of activities, and (iii) restrictions of participation. In 2006, this has led at the United Nations to rights for compensation for handicapped persons[10], with the clear-cut aim to make them function properly in daily life. Both personal factors and environmental factors may be involved. This may serve as a good example for older people in, for instance, geriatrics. Obviously, diseases and functional limitations are dependent although the mapping is far from straightforward[11].

Within the Hippocratic paradigm, physicians have been mainly trained as professionals in disease and treatment of disease, but less in functional limitations. Their role in the medical Hippocratic paradigm is mainly the decision making. In case of the functional health paradigm, they

might change into medical counselors, since the functional paradigm implies an empowerment of the patient. However, physician's role in acute disease remains pre-eminent. An important step in making the paradigm change operational, the above mentioned emerging concept of 'positive health' has led to interviewing different groups of professionals and laymen. This indicates that patients, healthy citizens, and professional carers value a broad concept of 'positive health'. Unfortunately, this is not yet supported by policymakers and pharmaceutical companies[7].

**Contours**

The essentials of the Hippocrates paradigm will remain intact as the central role of the physician in acute disease and cure, promoting interests of the patient, and protecting his/her privacy. However, new elements for optimal functioning will be added. In the era of Internet and smartphones, privacy protection is becoming more difficult. We will consider autonomy, prevention, permanent health education, cost effectiveness and sustainability, health care technology, and the position of ageing people and caregivers.

*Autonomy*

The information revolution of the last decades exemplified by the Internet has enabled a rapid increase of autonomy in broad sectors of the population. All types of information are now easily accessible, although quality may be uneven. This has challenged professionals in all sectors of society, who now have to deal with a population that reckons itself informed. This is obvious in the health care sector as well. Passive patients have turned into active searchers of information on the Internet, and more and more physicians and other health care professionals are being challenged by informed patients. Patients are becoming more and more empowered by the readily available information.

In this new situation, physicians remain professional experts, but their professional role particularly in chronic conditions is changing from leaders and deciders to knowledgeable, trustworthy, objective counselors and guides, thereby also bridging the gap between professional and laymen terminology. In the new era, health care professionals are putting forward the possible roads to go, along with advantages and risks, while leaving the decision to the patient/person. Obviously, people will continue to rely on the coaching of professionals, particularly in pain, acute disease, and end of life. However, the decisive appearance of a new health care paradigm is that people will take responsibility for their own functioning as long as possible and may avoid diagnostic and therapeutic events in which functional gains are unlikely or when, according to the patient, these do not warrant the side-effects or high cost.

*Prevention*

There is probably consensus that prevention is generally more effective than cure. Surprisingly, however, prevention plays a small part only in the health care sector, for example in the Netherlands less than 5% of costs[12]. It should become the core of health promotion, with substantial funding. This may reflect the underrating of long term effects as compared to short term costs, so common in politics: presently prevention has not yet achieved a proper business model. In this sense, short term economics is the biggest obstacle for progress in health care. Another reason of the neglect of prevention may be the overriding role in present health care of 'evidence-based' medicine as applied to cure. Evidence of the excellent outcomes of prevention is clear-cut, as witnessed by many long term studies such as in smoking, air pollution, and traffic accidents, and in particular by longitudinal studies with randomized control[13].

The discrepancy between prevention on the one hand and cure on the other is challenging the cost effectiveness of the rising budgets. Once people, well-informed, will take responsibility for their own health including costs, the medical and health care sector will experience important shifts in type and occurrence of diseases, cure, and care. In line with this, the recent World Health Report 2013 focuses on the importance of research directed toward progress of universal health care, i.e. full access to high-quality services for prevention, treatment, and financial risk protection[13].

A number of general prevention issues are well known, while others are likely candidates. Smoking is known to be risky. The extensive protective cover of moderate daily exercise is gaining ground. Fatty, sweet and salty food have been recognized as unhealthy as have overuse of alcohol and drugs. Obviously, we are still far from the desirable general awareness of healthy habits, let alone measures by government and industry to help bring about these aspects of sustainable health. Technology may play an increasing part, such as by air quality sensors, proper food indicators, exercise monitors, and many Apps and other Internet applications and in addition, also by a better organisation and mutual tuning of prevention, care, and cure. Informing people of preventive lifestyles and measures by the effective ways of present communication, is a basic part of the new functional health care paradigm[14].

Although prevention is moving toward a central dimension of health issues, there is a worldwide lack of funding of prevention research as to the potential gains in health[13]. New indicators and also integration of massive data are needed for getting grip on the enormous potential of prevention. Innovative prevention radiates directly to the sector of economics, health financing, and social care as well. Prevention must be based on a new global macro-economic model rather than on the straight perspective of a funding by health and social funds.

*Permanent education in health (care)*
For all citizens, the shift in health responsibility requires specific education at all phases of life: in primary and secondary education, during adolescence and adult life, and at old age all the way until the end of life. One has to learn how to take responsibility for one's own present and future health, to avoid risks and adopt protective and preventive habits, to learn when to turn to professional advisers in medicine and care, and when to adopt and adapt to specific health technologies such as sensors and alarms[15]. The (electronic) health record may become one's own property, with mandated copy to involved health professionals among which the general practitioner. A technology option might be a chip carried in a wrist watch. It is characteristic how absent the patient is in some of the early requirements of electronic or digital patient records[16]. The ownership of such records does not belong to hospitals, let alone to health insurance companies.

Health care professionals will also need specific education in defining their shifting role. Fortunately, continuing education is already part of the mandatory curriculum for most physicians and needs to be extended in content, also for other professionals in the health care sector. In addition, education has to be organized for older people themselves, thus promoting their own optimum functioning.

For citizens, health care professionals, health care administrators, health care insurance companies, Internet sites and 'the media' may take an important role in the educational field, and quality labels are essential if only for keeping commercial interests at bay. For citizens there is a need for professional teachers in different phases of life, in helping to develop and introduce proper learning programs. The learning will be most successful in its proper direct context rather than in theoretical classes, and involve both general skills such as interpreting one's own standardized health record and very practical skills including focused digital literacy and contextual assistive technology such as handling a walker or navigator. But critical problematic aspects may need some consideration. Usually the well-educated, well-to-do people are those who use for their benefit all possible health information. Media and health professionals are not yet good enough and may 'enlighten' culturally and socially marginalized citizens with some false ideas. How to change people´s real behaviour? This question remains open.

*Cost effectiveness and sustainability*
If the older citizen takes on the role as functional leader of her/his own health, or rather of her/his daily optimal functioning, it follows that s/he must also decide on cost effectiveness of interventions which is a basis for sustainability. In many countries, this is a far cry, since s/he may not even be informed and totally unaware of costs, let alone on cost effectiveness. Also many physicians cannot take on their role as counselors on cost effectiveness of interventions. For example, there may be too much waste, underutilization of expensive apparatus, or too many managing staff. The system of health care insurance may not support cost effectiveness, since increased turnover is in its interest and translated into higher premiums, higher own-risks, but not in better cost-effectiveness. A huge increase in general cost awareness is necessary before each citizen will be in a position to share responsibility for the costs of his health care and to weigh extra quality of life versus extra cost. There can be no sustainability without transparency in cost effectiveness. This may be stated as the need for a new business model of functional health care, but some vested interests may be expected to resist such transparency[17]. However, possible side effects for older persons, refusing care or even cure to save the money of the community, should be counteracted, and societal moral pressure leading to assisted suicide strictly regulated.

*Health care technology*
There can be discussion if technology is the driving force of change in society including of the health care paradigm, or that it just supports developments that are occurring anyway. But there can be no doubt that technology innovation of products and services, including Internet applications, is an essential element in the increasing autonomy of citizens also in the health care domain. Technology products and services are ready to empower older people as to their own health. Although technology may sometimes be just as effective as drugs, it belongs to another chapter of health care. Industry is already taking the lead by providing a whole spectrum of tools for monitoring bodily functions, for measuring air, water, and food quality, for easing communica-

tion with passive and active alarms in case of accidents, in smart-phone apps, in telecare, in robotics, and many others, both for individual and for professional use in prevention, in cure, and in care. Integration of these has to be supported by proper software tools. As to the medium of Internet and smartphones, continuous developments are taking place, where quality control is increasingly realized. It may be observed that presently quite a few new health products in hardware and software are still lacking in robustness, which is annoying if not potentially dangerous.

A possible tool to maintain oversight on this huge reservoir of technological options and solutions for increased functioning of older people is the gerontechnology impact matrix that plots five main domains of human life against four types of goal[18,19]. Top level of goals concerns enrichment of daily life, indicated as 'enhancement & satisfaction' including leisure and artistic expression, whereas active prevention ('prevention & engagement'), compensation and relevant support for trailing physical, perceptual and cognitive functions ('compensation & assistance) and care support ('care support & organization) are the other major goals that technological interventions may serve.

*Ageing people and care givers*

Ageing people are special in that (i) they are more likely to suffer from several restrictions and/or diseases at the same time (multi-morbidity); (ii) they have to spend more effort to adapt to any new situation and learn to use new products and services; and (iii) end-of life comes into view. For the population of the developed countries, longevity results in 30 or 40 years more life expectancy than one hundred years ago, but the large community of ageing people is heterogeneous. Old people are mainly healthy, but some are frail and dependent. The distinction between 3rd age and 4th age may be sociologically relevant: 3rd age as characterized by independence and normal daily functioning, also in the presence of certain restrictions, while 4th age is characterized by frailty and dependence on others[20]. In the latter case, the basic responsibility may shift to family members in close interaction with medical and other health care and aid professionals. As for 3rd age citizens, it is important that teaching, learning and training is directed to specific relevant knowledge and skills in the actual context of use or relevance and taking their life history including education into account.

## The new paradigm: Sustainable and functional health

In the present early state of transition of the health care paradigm, it is impossible to foresee even the near future. But in terms of scenarios, coherent options may be sketched. In this exercise, autonomy of people and sustainability are the basis of the emerging functional health care paradigm, with medical and other health care professionals as their individual counselors. Counseling will increasingly be directed on prevention: adopting healthy lifestyle habits throughout life, minimizing or countering general or specific risks such as in proper protective clothing, genetic counselling, risk of falling, or vocational risk. There may develop demand for new types of integrative health care professional. From 2005-2010, the French Ministry of Health observed in France a fivefold increase of health and aid professionals as compared to the growth in French population. Over the 200 official categories of jobs, new jobs are appearing which are considered as signs of adaptation of the sector to social evolution[21].

In an optimistic scenario, there is for example extensive monitoring and information in the food sector, based on government regulation. Transparent cost effectiveness is generally available and at the basis of individual decisions as to one's own health. Older patients will need a coach in health care matters. In some countries, the general practitioner may become such primary coach and health care counselor at the center of the professional web. The role of health care insurance will change as the added value of health can be weighed against the added costs. This is true for hospital services as well. But the best way to measure added value of health remains unsolved and open to progress,

## Conclusion

Ageing people increasingly demand to be able to maintain functional autonomy in the wake of limitations from chronic diseases. This demand is enabled by a stream of new technological products and services, and is causing a paradigm shift in the health care sector.

Ageing people may want the best possible health for their daily functioning in terms of body, mind, and social relations. The Hippocratic paradigm is characterized by the primary role of physicians and other health care professionals. They will maintain this role in acute situations. The new emerging paradigm, here called 'Functional health', and valid for chronic situations, gives people a central role in the care of their own health, with health care professionals in the role of knowledgeable counselors. In the current transition period, harmonisation between these two paradigms may be somewhat chaotic, especially as the economic models underlying the two paradigms strongly diverge.

Proper management may ease the problems and help to maintain the confidence link between people and care professionals that is so essential for optimal prevention, cure, and care. Continuous education and information for everyone at any age is a necessary ingredient, also for health professionals adapting to their new roles. Cost transparency is needed for comparing added value to added cost, as a basis for sustainability, and provides a coherent economic underpinning to this new approach to health care to which vested interests must also be turned.

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