Emotional Images in Medicine

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Abstract
This paper introduces ideas for future research that explore non-diagnostic uses of images in medicine. The dynamics are studied from a subjective and emotional perspective, a standpoint common in art and design but rarely considered relevant in academic medicine and science. The fundamental aim of the project is to study how images can influence and alter the afflicted individuals’ experiences of body and health, and contribute to enhanced feelings of well-being, participation and joy in everyday life.

There is a growing public interest in medical images, both in popular science but also in the private and personal spheres, one example being the controversial use of foetal keepsake videos as recreational images. There seems to be an increasing need for people being able to see, and consequently know, more about themselves and their medical situations. Emotionally and individually designed images will probably play an important role in future healthcare, both as an integrated part of regular medicine and as private emancipative artefacts.

A series of design criteria are discussed concerning the format of the images, i.e. original or modified clinical images and individually designed images based on personal demands and needs. Different modes of use are discussed, ranging from informational, educational and communicative to emotional and recreational, with the experiences of well-being and emancipation as common denominators. An outline for future research is presented discussing potential user groups, functional specifications including accessibility and flexibility as well as questions of ethics, economics, intellectual property rights and confidentiality.

Keywords: Medical images, truth and emotions, experienced health, emotional artefacts

Medical images
Medical images generate a great number of emotions and thoughts; on one hand a fascination over the technological ability to show what used to be invisible and hidden, on the other hand feelings of disgust, shock and distaste but also engagement, interest and curiosity. Confronted with a medical image, one almost automatically tries to see what it depicts and to figure out what is “wrong”. These images have an enormous power over our lives, which is not equally apparent for other types of images. In a very tangible and intimate way, they portray the individual and have an almost prophetic and portent quality when it comes to detecting serious diseases and consequently ruling over life and death.

For the professional, there seems to be a direct and almost sacred connection between the depicted and the image, stating that it is depicting what really is there, without aberrations, additions or subtractions. This implied iconic nature claims a veracity and reliability of the
images which facilitate correct, or at least probable, diagnoses. Is this true, and if not, what then is really depicted? The focus is often on smaller details, parts of the whole, many times to minimize the potentially dangerous radiation, expenses and amount of information to be processed. The images are produced using a certain technology suitable for a specific end, thus providing only one perspective of the body part or function of interest. It also takes extensive experience and training to be able to diagnostically decode the various images, adding an inter-individual variation of the interpretation. Added to this, there are the different mindsets regarding medical images. To state it bluntly, a medical doctor looking at an X-ray image would say it shows the bones of the body whereas a physicist would claim the image to be a shadow of the bones. This crude example is used to highlight the fact that there is no one true image of a medical condition and no single correct interpretation of an image. All these factors stress that a diagnostic image (and its interpretation) is actually an arbitrary (iconic) representation of a given medical condition.

The depicted individual, who experiences the “lived” health problems, has a holistic perspective where the physical and emotional aspects are intimately intertwined – “I am the one who is ill, not the bones.” The image here functions as a symbol of the condition and as such it refers not only to facts and knowledge but also to personal experience, emotions and associations. There clearly is a fundamental, although not incommensurable, difference between the individual’s and the professional’s attitudes towards the image. This difference could be seen as a potential rather than a problem and lead to a more fruitful and mutually beneficial approach for using individually designed images in healthcare.

Often, the medical images are only briefly shown to the depicted individual. In these instances it is mostly X-ray and sonographic images, which are considered easy to understand and do not demand further explanations or reassuring comments. From the layperson’s perspective, the handling of the medical images often seems to be covered by mysticism and secrecy. It is as if the attitudes towards images in healthcare have not kept up with general developments in society. While active pursuit of knowledge, dialogues, communication and emancipative participation generally is encouraged, medicine still seems to practice a one-directional flow of information with the medical professional as an active transmitter and the depicted individual as a passive receiver. The consequence of this is an effective monopoly over the use and interpretation of these images and also over what information is considered
relevant and desired. A crucial question is thus why and to what ends images are produced. Is it wrong to assume the clinical interpretation as the only aspect of interest to the individual or are there other wishes and needs? If so, what are they and how can they be presented?

Images as language

Information and the verbal dilemma

The need for correct and effective information is imperative in medicine, not only to make sure the patient follows given instructions and recommendations but also to make the patient more participative in the healing process. The crucial issue is thus what difference it makes to know more about your own illness or disability. This puts forward the need for a 180-degree revolution when it comes to who selects the information and the means of communicating it. It should no longer be a matter of teaching the patient, but rather giving feedback on the information and communication provided by the individual. How can this be achieved?

Verbal language is impressively rich and adaptable. Medical terminology is precise and suitable regarding diagnostics, prognoses, possible side effects and potential scenarios—information based on epidemiological statistics. This language, on the other hand, may appear abstract and impersonal to the layperson. At the same time, everyday language is impractical and potentially dangerous for medical purposes. This verbal dilemma emerges in meetings between highly specialized professionals and laypersons, thus constituting a risk for misunderstanding.

Another aspect is that in speech and writing, (medical) information is linear and logical; the syntax is fixed and only marginally flexible. Considering the tradition in medicine of an authoritative knowledge monopoly, a sender-receiver relationship is immanent since only one at a time can transmit information and it is the doctor who sets the agenda. When it comes to serious diseases or disabilities, the irrational reactions to a diagnosis and the initial overwhelming amount of information might require other forms of communication, especially in the early stages of a lifelong condition.

Pictorial competence and visual communication

In modern western society everyone is exposed to a constant flow of images from
advertising, television, newspapers, magazines, cinema, packages and other channels difficult or even impossible for us as individuals to control or filter out. Hereby, we are constantly, often more or less unconsciously, training our skill to process and actively use images in various contexts and situations. At the same time, we gain a better understanding for the underlying purposes and intentions of the images. As Deacon expresses it: We have become a symbolic species (Deacon, 1997). The ability to interpret and understand images seems to be universal and inherent. At the age of 24 months, children have the capacity to apprehend images as representations, not only as objects per se (Suddendorf, 2003).

To many, alternative modes of communication complement or even replace the sometimes overwhelming stream of words used to describe a situation or an object. In this perspective, a change towards the potential alternative uses of medical images is inevitable. Images are helpful in many areas: communicating ideas and emotions, visualizing the invisible, representing situations, externalizing the self. As emotional or symbolic tools, images are intuitive and demand no interpretation or specific knowledge. By looking at and discussing images, new knowledge specific for the individual is gained, questions and answers are defined via the images and the dialogue assumes the shape of exploring-giving feedback, with both of the participating individuals actively contributing in both areas. Since questions arising from a perspective rooted in personal experience and emotions are fundamentally different from medical/clinical questions, images can function as mediators between the two. Effective modes of communicating thoughts, emotions and questions are thus facilitated without the need of knowing the correct terminology or even a verbal language at all (Jönsson, 2003). In this manner, images function as a bridge between layman and professional languages through their emotional and cognitive properties and both qualitatively and quantitatively enrich understanding by mediating knowledge in ways other than speech and text. The images are something concrete and physical to talk about and make it easier to ask questions or remember by simply pointing at what you do not understand. This requires no previous knowledge and facilitates mutual informational and emotional exchange.

To better understand the dynamics and potential of using emotionally designed images in healthcare, other fields of research such as psychological perception, semiotics, visual communication, art and cognitive research should be investigated.
**Emotional design**

There is an enormous emotional power in being able to see your own specific disease or disability. This constitutes a strong incentive for using images for other purposes than the strictly diagnostic: consolation, encouragement, affirmation or facilitating social interaction – qualities not directly linked to the medical assessment but probably affecting well-being in profound ways. The advantage in using as many available senses as possible to convey information and enrich communication is self-evident. Why exclude possibilities for creating better understanding? By applying experienced-based and user-oriented design methods to medical images, there is a fundamental change in how the exchange of information, emotions and knowledge is performed.

What is achieved by using medical images from an individual perspective? From a personal point of view, it is not only purely instrumental purposes, such as exploring one’s disease or the interior of one’s body by increasing and diversifying the accessed knowledge and information; it also provides a means to re-evaluate the notion of sickness and health in general. Images can manifest anxiety, worries and vague thoughts in a physical object and make an otherwise abstract (verbal) diagnosis tangible. This is equally important for other people affected, (family, friends, co-workers, etc). These persons acquire knowledge and understanding of the illness and special needs and hence gain access to the lifeworld of the afflicted individual. In this way, the images serve a social function and improve relations between people.

In everyday life, images could encourage the person involved to continue a treatment or rehabilitation programme outside of the medical institutions, e.g. at home or in the workplace. The instructions given by the doctor are biased by the emotional message incorporated in the image, convincing a patient to actually follow the recommendations given. Another application of emotionally designed images in medicine is to put the illness or disability in proportion to something else. In some situations, for example, it is comforting to see how large a tumour is in relation to the whole body or visually depict otherwise abstract statistical data and prognoses. To be able to see this in front of you helps to recreate the mental image of the illness or disability, offer a new perspective and explain that the situation is not as hopeless as previously imagined. These mental images should not be underestimated.
since they have been shown to be as real as physical images (Kosslyn, 1968).

Emotionally designed images can be part of describing the personal history of everyday life in the form of pictorial diaries or even as additions to the family album alongside pictures from weddings, vacations, graduations and other important or emotional occasions. Through this domesticating process, personal medical images are integrated as a natural part of everyday life and extend the intimate autobiography.

An example
There is an ongoing and active debate within the medical community concerning what are referred to as recreational images, which are medical images the individual buys as mementos or for fun. One example is expectant parents who purchase high-resolution video sequences of the foetus, foetal keepsake videos. According to the general principle of caution, it is recommended that the foetus should not be exposed to unnecessary radiation since the long-term effects still are not fully known (US FDA, 2002). The fear of increased expenses for society is also an aspect of the discussion of the growing demand for recreational images. These are of course important arguments. There is, though, another side of the debate focusing on the benefits these kinds of images have, both for the individual and for society in general. In a study, Maier et al. (1997) showed that the mothers reported more incentive to endure pregnancy-related difficulties, reduced anxiety, and improved bonding between the mother and the foetus when shown high quality 3D ultrasound images. These kinds of images have also been shown to have modifying effects on smoking and other harmful habits of the mother during pregnancy (Pretorius, 1996).

Format design
Initial criteria
A first criterion is that the images must be made accessible to the individual, which is essential for further participation and personal development of the images. By focusing on the personal ability, needs and experience, a greater opportunity to create, interpret and use the images in proper and meaningful ways is achieved. This has emancipative and democratic implications when it comes to transparency, the right to participate and whose demands and wishes are important in healthcare. In addition, the more personal and unique the images are,
the greater impact they have on the individual.

Other basic criteria concern dynamics, flexibility and clarity, time efficiency and low extra costs at the same time as the images should demand little or no knowledge of terminology, technology and medicine on the part of the patient. It should also be easy to distribute them as printouts, email or physical objects, for example. As a basis for further development, it is efficient to use images already produced and available within healthcare in order to avoid unnecessary exposure to radiation and additional costs.

**Manipulation or creation**

Different persons have different needs and ends and hence the images should be produced and/or manipulated accordingly. Most people would probably want or need some modifications or personal adjustments to meet their individual wishes or even have a completely new type of image created for the specific situation. For some, there also exists a need of being able to change the images at home, to show changes or progress but also to visualize dreams, goals or other personal experiences. This could be done in a dialogue with the physician in order to avoid potentially dangerous misunderstandings but also to communicate the patient’s experiences of health and treatment to the medical personnel. The manipulations could include facts, information, statistics and medical prognoses in conjunction with a disease but also personal comments, emotions, experiences, visions and goals. The crucial point is to meet the individual needs and abilities to avoid a one-directional and authoritative flow of solely factual information.

There is also an opportunity to create new image formats which are not based on diagnostic images at all. This approach is very interesting and liberating when it comes to visual representations of the experience of health and body functions. In the visual arts, there is a long and diverse tradition of modifying existing medical images and producing alternative ones. To clarify how heterogeneous the relationship is between visual arts and medicine, some (more or less) contemporary artists could be mentioned: Orlán (plastic surgery), Stelarc (cybernetics), Eduardo Kac (transgenic art), David Kremers (biogenic painting), Frida Kahlo (oil painting) (Martinez-Lavin, 2000) and Nilsson (microscopic photography).

These, and other artists, use their images to pose a number of questions concerning existential
and social matters: “How does this affect me as a human being?” “Does this alter our
perception of ourselves as individuals and as a species?” “How can this help me to
understand more?” In a medical situation, these are normal reactions for a patient, and
healthcare professionals can learn from artists how to use images to channel these questions
into physical artefacts. Artistic tradition and experience is thus a valuable source for
exploring alternative forms of designing emotional images such as visualizing mental images,
creating comparative or best-case images and designing challenging or distracting images to
spur rehabilitation by focusing on what is feasible and positive.

There are many examples where visual (and other) artists collaborate with medical
institutions to improve the quality of healthcare (SAH; NNAH; Lime; NEA; Public Art;
Gardner, 2002) and the experiences of the environment (Staricoff et al., 2002).

**Digital advantage**

Digital journals are being introduced to an increasing number of hospitals and image archives
are being scanned and digitized in order to be included in the digital systems containing all
information needed in modern healthcare. This digital format allows alternative and flexible
uses of the raw material (i.e. ones and zeros, not necessarily images as such) and has the
advantage that almost any kind of information can be efficiently added or converted to serve
other purposes than diagnosis without requiring troublesome storage or vast additional costs.
Editing is easy, copies can be made for next to nothing and a wide range of different
applications can be programmed and implemented: adding written, spoken or graphic
information, erasing irrelevant or distracting parts of the image and inserting hyperlinks
leading to professionally reviewed information; but also the opportunity to totally change the
concepts of the image of health and well-being – the possibilities are almost endless.

**Economy**

A question that almost automatically is raised when adding another element to the clinical
apparatus is that of increased costs. Healthcare is subject to economical cutbacks and time is
often limited for the busy staff. These kinds of images can, on the other hand, prove to save
money and reduce the work load. Through specially designed images, individuals become
more autonomous and empowered when it comes to their own situation. They could reduce
the number of unnecessary return visits and telephone consultations by providing
personalized support and information at home and by alleviating anxiety and worries. In a larger perspective, for society as a whole, it could prove to be a good, or even profitable, financial investment to develop and utilize these individualized medical images. If it is achieved in an affordable and efficient way, with high quality and functionality, there is much to be gained, both personally and socio-economically.

**Potential user groups**

For many people, worrying is worse than knowing and naturally there are many groups which would benefit from an active and emotionally intelligent use of images in healthcare and rehabilitation. This is true for everyone who wants deeper insight and control when it comes to personal health and treatment but is especially important for certain groups who have difficulties communicating verbally and who do not seem to have any alternatives. Children often find it hard to take in information and explanations communicated through spoken or written words. Images could make explaining easier and to make the situation less dramatic and frightening by providing information in a pictorial form with which the child is familiar. This communicative aspect of images is also helpful for other groups with language challenges in society: immigrants, persons with cognitive disabilities, aphasic persons, mentally disabled individuals, etc.

There is also an increasing population of elderly people in the western world and, in many countries, this is a well-educated generation which will place higher demands on individualized and alternative healthcare with greater transparency and participation. As this powerful group starts acting more as a consumer group in the healthcare market, they will require intelligent and efficient modes of distributing the vital information they themselves demand. At the same time, they will opt for information that is specially adapted to the receiver. Here, specially designed images will play an important part.

Individuals with long-term diseases or lifetime disabilities would especially benefit from using images in their efforts to gain a better understanding of their situation. These persons often have repeated contact with the healthcare system and, over time, achieve a high level of knowledge and experience concerning their condition. Through images, they are able to obtain alternative and additional understanding through their individual and emotional perspective and gain power and participation in their situation.
Availability, rights and confidentiality

Naturally, confidentiality and personal integrity must be considered in all aspects of medical information and communication. Therefore, there is a great advantage in using the patient’s own images, since data from other individuals are not needed. The incentive of making the images, originals or altered, available thus does not have to be in conflict with ethical concerns and questions regarding property rights. On the contrary, the moral and intellectual rights to know more about yourself could override the hesitation of showing the images to the patient. The question is who actually has the rights to access and use the images. The implications are of fundamental importance if it turns out to be the individual who owns the material and data.

Outline of upcoming research

In the summer of 2004, an initial research project will be started in collaboration with Spenshult Hospital for Rheumatic Disease in Sweden (Spenshult). The work will focus on a smaller group of in-house patients (5-7 individuals) over a period of two-three weeks. They will be presented a number of methods to visualize pain, rehabilitation progress, various functional dynamics and other aspects of interest within their routine treatment programme. The aim is to provide (visual) tools to improve the experience of well-being and empowerment as well as gaining access to the patient provided information (PPI). The research will be conducted on a situated, participatory and phenomenological basis according to the methodology used at Certec (Jönsson et al., 2004).

Take home image

There is a great potential in exploring individually and emotionally designed images in medicine and rehabilitation. The implications for the afflicted individual range from enhanced participative and emancipative qualities to emotional and communicative functions. These images will function as extensions of the healthcare system by reaching into the home and everyday life of the individual on his or her terms. To focus on the possible and the positive or presenting information in alternative manners, taking into account different needs and circumstances, are some interesting uses of these images to augment and personalize
medical communication. If these emotionally designed images change the experience of health for the better, placebo effect or not, and also (re)create emotions, thoughts and memories essential for personal well-being, much is gained. If so, not using these images would be immoral.

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REFERENCES


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