

# Technology for care as a self-directed learning process

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*R.F.M. Kleissen, Technology for care as a self-directed learning process. Gerontechnology 2007; 6(3):164-168.* Over the last decade innovative economic processes have developed that were impossible before the advent of modern information and communication technologies (ICT). Successful applications of ICT, for instance internet banking, show how such innovative processes inevitably change tasks, roles and responsibilities of the participants in these processes. Telehealth and telecare aim at exploiting the potential of ICT to improve the quality of life of the client, his/her immediate environment and the quality of work of the care professional. This paper presents a vision of how ICT can support client centered care. It proposes a care process that encourages clients to become more independent from professional care and take more responsibility for managing health problems. The design of this process assumes that care is a self-directed learning process and that tasks, roles and responsibilities of all actors and ICT tools can be defined accordingly.

**Keywords:** cure, care, self-directed learning, ICT tools

Telehealth and telecare<sup>1</sup> have shown that it is possible to make existing care processes more efficient, often by reducing unproductive traveling time and administrative effort. However, such solutions are specific to particular diagnostic groups and geographical settings. It is worthwhile to seek out more generic alternative concepts that fully exploit the potential of new technologies: to enable things that cannot be done without these technologies. This paper presents a blueprint for an alternative care process that is practically impossible without modern information and communication technologies (ICT). It proposes that appropriate technological tools be developed to support changed tasks and roles created by the modified process.

## THE CARE PROCESS

There are numerous ways to define care. This paper refers to care as a process that aims at management of an irreversible abnormality of body structure or function<sup>2</sup> and its consequences for life quality for the individual involved. It complements the cure process, where medical inter-

vention leads to restoration of structure or function and subsequent full recovery of health.

This conceptual separation of cure and care is a crude but effective way of clarifying important constraints that should be taken into account when designing and developing successful technologies for innovative care. Table 1 compares relevant characteristics of cure and care processes. The home environment is the natural location for care, and the informal caregiver is a natural element of that environment. However, care also comprises complex medical tests or interventions delivered in hospitals to contribute optimally to quality of life, or it may include the participation of health care professionals in care delivery at home. Hospitals have realised the importance of home care, and have begun to create simulating home environments as part of their facilities to promote healing. However, in the future, with rising demands for care and professional resources that become increasingly scarce, clients will increasingly rely on informal caregivers acting in their own home environment.

Table 1. Characteristics of processes in cure and care

Cure	Care
Aims at full recovery	Aims at management of chronic disorder
Short interaction caregiver – patient	Long interaction caregiver – client
Little involvement informal caregiver	High involvement informal caregiver
Focus on increasing life expectancy	Focus on quality of life
Patient consents	Client decides
Hospital environment	Home environment
Single medical discipline	Multiple medical disciplines

Cure and care are two different processes requiring specific tools to be effective and efficient. Table 2 models characteristics of technological tools that support these processes.

Cure rests on assumptions about the biomedical model. This model proposes that health problems have causes that can be identified, and that elimination of the cause of a disorder will result in recovery of the healthy state. In cures, sophisticated technologies are used that are designed for locating the cause of the health problem and suppressing or eliminating it. These technologies are complex and expensive, but the economies of scale present in a hospital environment bring the cost of these technologies and the necessary specialists down to an acceptable level.

Conversely, in care, elimination of the cause is not possible, and the biomedical model does not apply. Care technologies aim at optimising a client's quality of life by augmenting or replacing abnormal or missing body structures or functions, or adapting the living environment.

It is evident that care processes require different technologies than those developed for cure. The technologies have different purposes; need to be used in different environments, and by different categories of users. Technologies designed from the perspective of the biomedical model and aimed at cure have a high risk of failure in care. There are some technologies that play a meaningful role in care but can only be applied in hospital environments because of their complexity. The development and simplification of these technologies for future deployment in the home

environment so they may be safely used by non-specialists is a worthwhile goal. Considering cure and care in the light of the extent to which patients or clients are dependent on professional health care provides some interesting perspectives. The biomedical model has traditionally been successfully used to cure; the model describes how the expertise and skills of the health care professional are needed to diagnose the cause of a health problem, and to decide the most appropriate treatment to eliminate this cause. A *patient* is *dependent* on the expertise and skills of the health care professional. However, this biomedical model fails for care, where the cause of the health problem can not be eliminated. In this instance care aims at achieving optimal quality of life within the constraints of the irreversible abnormality. Achieving optimal quality of life is a process where a *client* learns to set his/her personal objectives and develop strategies to reach those. In daily life, this client wishes to be maximally *independent* of the health care professional.

The same holds for informal carers; families, parents, children provide most of the effort in care for the disabled and older people. Any care process should also address the carer's quality of life, and the approaches to the client's care processes also apply to them, if perhaps only indirectly. Each person holds an individual perception of optimal quality of life. This perception may evolve substantially from the moment a chronic disorder was diagnosed to the later stages of the disorder as experience in managing the condition grows. Clients and family members have

Table 2. Characteristics of technologies in cure and care

Cure	Care
Used by professional	Used by client or care-giver
Aims at identifying and eliminating causes	Aims at managing consequences
Requires specialised expertise	Requires non-specialist expertise
Expensive facilities	Cheap
Complex	Simple
Standardised	Fitted to individual needs

their individual learning needs that evolve over time as care management progresses, and there is no general or prescribed curriculum for such a process. Self-directed learning is a logical alternative.

### SELF-DIRECTED LEARNING

In essence, self-directed learning is any form of learning in which individuals have primary responsibility for the planning, implementation, and even evaluation of the learning effort<sup>3</sup>. It is an alternative to traditional approaches where teachers decide what and why students must learn. Self-directed learning has the following characteristics: (i) individual learners can become empowered to take increasing responsibility for various decisions associated with the learning endeavour; (ii) self-directed learners can transfer learning, in terms of both knowledge and study skills, from one situation to another; (iii) self-directed study can involve various activities and resources, such as self-guided reading, participation in study groups, internships, electronic dialogues, and reflective writing activities<sup>3</sup>. Self-directed learning employs ideas developed by Rogers<sup>4</sup> about how a person optimally learns; a considerable body of knowledge and experience in self-directed learning has developed over the last decades at schools and universities that can be useful in designing a care process that is based on these principles.

### Care Webs

In the 1970s, Illich<sup>5</sup> developed principles of self-directed learning and also proposed a strategy to enable this. He suggested the creation of a rich learning environment in which the student can learn knowledge and skills according to his/her needs. He

called this environment an educational web - long before the existence of the internet. This learning environment provides the following services:

- (i) Reference services to educational objects, which facilitate access to things or processes used for formal learning;
- (ii) Skill exchanges, which permit persons to list their skills, the conditions under which they are willing to serve as models for others who want to learn these skills, and the addresses at which they can be reached;
- (iii) Peer-matching: a communications network which permits persons to describe the learning activity in which they wish to engage, in the hope of finding a partner for the inquiry;
- (iv) Reference services to educators-at-large, who can be listed in a directory giving the addresses and self-descriptions of professionals, paraprofessionals, and freelancers, along with conditions of access to their services. Such educators, as we will see, could be chosen by polling or consulting their former clients.

ICT is now in a stage of development where the services described above can be effectively implemented. ICT can support a care process that encourages a client to engage in self-directed learning in a 'Care Web'. The Care Web is similar to the educational web; as an alternative for consulting a health care professional a client can learn from the knowledge and experience of peers, find specific information about his/her health problem, search for relevant opinions and advice anywhere at any time. In this way a Care Web environment and its appropriate tools to support communication enable clients to take the initiative and assume responsibility for their

care process. This implies a new role for professional care: it should create learning environments that enable clients' self-directed learning as a part of routine care. ICT tools need to be designed on the basis of requirements imposed by this process.

## Self- and peer-assessment

Personal goals are the starting point of a self-directed learning process, and a client's self-assessment is the basis for choosing these goals. Self-assessment and also peer-assessment are useful for monitoring progress towards reaching the goals, and adjusting the learning process where needed. A Care Web environment can be designed to use the appropriate tools and services to conduct such assessments. Assessment tools may provide information about the evolution of body function or structure, for instance, blood pressure or body weight, or function, for instance, walking distance. The assessment of participation, however (factors such as employment status, housing, and social relationships) is a topic still under debate<sup>6</sup>.

Assessment tools have been proposed for telemonitoring purposes, but the role they play is different in the Care Web construct. Here assessment tools facilitate learning through feedback; for example, a successful heart monitoring application feeds objective physiological data back to the client to encourage behaviour that improves the health condition<sup>7</sup>.

## Technological tools

A Care Web can be supported by an internet portal that provides access to the four services described above. The internet contains a wealth of material that facilitates formal learning, but is poorly organised. The portal can facilitate locating information and can make databases available that enable the other three services. For those clients whose limitations in mobility cause difficulties in participating in the learning process, the portal also provides access to adequate communication channels. This may range from instant

messaging services or e-mail communication to peer-to-peer or group video conferencing, depending on their needs.

The portal can also help by making available appropriate self-assessment rubrics or other documents for self- and peer assessment. Where objective and quantitative tools are used in self-assessment the portal can provide additional data processing, interpretation and communication services. The raw data for objective measures may be obtained from sensors that are unobtrusive and seamlessly integrated in the living environment of the client. For instance, a switch in the seat of a chair can give an objective picture of the time a client is seated. The client can use this information as evidence in a learning process to become more active.

## Changing roles

The rich learning environment encourages a person having an irreversible impairment to become a client who acquires and develops skills for optimal empowerment and independence. This change in role from a patient to a client can not be forced, but can only be learnt through intrinsic personal motivation. The role change also requires the health care professional to play a different part. Under the concept of self-directed learning the professional will act more as a coach and 'facilitator' than as a source of medical expertise. Because of the rising importance of educational skills and the need to motivate the client properly, a professional coaching a group can help more clients in a given amount of time and in this way be more productive.

The concept of care presented in the foregoing discussion implies a changing role for health care organisations: the traditional role of providing care must shift towards providing a 'rich' learning environment employing the know-how and experience of the employees of the organisation. The assumption that care is a self-directed learning process has important consequences for those patient groups that have

lost the ability to learn. For those patients it is more efficient to address the learning needs of the persons who care for these patients.

## Circumstantial evidence

The idea that a care process as self-directed learning will be effective is an unproven hypothesis. On the other hand, some circumstantial evidence supports the concept. Research literature suggests that clients' participation in support groups suffering from chronic health problems leads to improved quality of life<sup>8</sup>, even in the absence of a health care professional. Similar effects have been reported for on-line cancer support groups<sup>9</sup>. Internet support is valuable for patients with rare, disabling or stigmatising disorders and for caregivers whose responsibilities prohibit attending meetings<sup>10</sup>. The evaluation of the role of learning in achieving viable outcomes was not the aim of these studies, however. Nevertheless, it is reasonable to assume learning in such groups is both possible and effective. For example, in one study the effectiveness of a training program supported by telephone and video to manage

anger and frustration for dementia carers<sup>11</sup> was clearly demonstrated.

## CONCLUSION

The description of a Care Web proposed in this paper shows how an innovative concept of care that exploits ICT implies changes in roles of clients, professionals and care organisations. If the concept of care as a self-directed learning process is adopted, a large body of knowledge and experience developed in education can be fruitfully used in its implementation.

There is some evidence suggesting that a care process based on self-directed learning may be effective in improving quality of life and reducing the burden on the professional care system; minimising the dependence on professional care is the key to reaching these two seemingly contradictory goals.

Well-conducted experiments are needed to verify the hypothesis that methods and technologies achieve their designated aims: to improve quality of life of the client and care-giver, improve the quality of work of the health care professional, and contribute to cost containment.

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