The Chain of Trust project is co-funded by the Public Health Programme of the European Union managed by the Executive Agency for Health and Consumers (EAHC)

Public Health Programme

Chain of TRUST

Understanding patients' and health professionals' perspective on **Telehealth** and building confidence and acceptance

(Grant Agreement N° 2009 11 13)

Report on the findings of the Literature Review

Executive Summary

This document reports on part of the work performed within **Work Package 4, *Assessment of patients and health professionals' perspective on telehealth*** and serves as the main deliverable of **Activity 4.1. "*Literature review on a) Users' perspective on telehealth b) Communication approaches and tools related to telehealth*"** aiming to provide a comprehensive collection, review and findings of the relevant literature for the **Chain of Trust** project.

The deliverable contents include an overview of major and up-to-date work carried out on a global scale in relation to **Chain of Trust** goals and objectives. It presents a clear formulation of findings based on the analysis of more than 160 scientific publications including peer-reviewed journals, scientific textbooks and other relevant literature that are of direct interest for the work performed within the context of the **Chain of Trust** project (www.chainoftrust.eu).

While providing an overview of the state of the art knowledge on user perspectives on telehealth and highlighting a number of under-researched areas and knowledge gaps requiring further investigation, this document is also meant to provide guidance to the project consortium for designing the questionnaires for the online survey, framing and conducting the national workshops and the European focus groups.

Table of Contents

1. Introduction

The "Chain of Trust" (heareinafter CoT) project aims to assess the perspectives of the main end-users of telehealth services, i.e. patients, doctors, nurses and pharmacists across the EU to see whether and how views have evolved since the initial deployment of telehealth and what barriers there still are to building confidence in and acceptance of this innovative type of services.

The CoT project is structured around two main components:

a) Assessment of patients and health professionals' perspective on telehealth (Knowledge gathering)

b) Raising awareness and understanding of users' perspective on telehealth (Awareness raising)

With regard to the first component, the CoT consortium will use a number of means to assess the views of patients and health professionals with the focus on gathering qualitative information. This literature review is the first tool the CoT consortium used to fulfil the "Knowledge gathering" component by gathering state-of-the-art evidence of the perspective of patients and health professionals on telehealth throught Europe and beyond as as substantiated in the literature.

This literature review also serves as a basis for designing and developing the other activities meant to contribute to the "Knowledge gathering" component, notably the online survey and the six national workshops.

This document presents the detailed analysis of the findings of literature review with a focus on:

a) making assumptions on different factors affecting user perspective on telehealth with a view to validating them through the online survey and national workshops;

b) highlighting existing knowledge gaps in current knowledge about telehealth user perspective which needs to be bridged through the online survey and national workshops;

c) suggesting possible directions for the Chain of Trust consortium and future research for further investigations on user perspective on telehealth.

2. General conclusions of the Literature Review

2.1 General attitude towards telehealth adoption

The literature review clearly indicates that **the state-of-the-art literature** on user perspective of telehealth **does not provide a definitive answer** as to whether the **various user groups think of/perceive telehealth as an added value to more conventional ways of delivering healthcare services**.

In an attempt to draw some general conclusions based on the findings of the articles reviewed by the CoT consortium we could say that the ideal system of care from patients' perspective would be – provided that certain conditions are fulfilled (e.g. ensuring adequate quality, reliability and safety standards in telehealth services) – a **balanced mix of telehealth and more conventional healthcare services with the former complementing rather than replacing the latter** [10, 112].

Generally speaking, health professionals tend to have positive perceptions when using telehealth in so far as these services enable them to have a more continue therapeutic relationship with patients and to provide good quality care. Healthcare staff attitudes would seem to be positive towards telehealth as a whole or towards certain telehealth applications (e.g. tele-education and diabetes consultation). Health personnel would appear to regard telehealth as a normal development in technology diffusion in healthcare, expressing the opinion that it had become and everyday phenomenon. Despite this, some studies have highlighted that perceived benefits of telehealth for health professionals *vis-à-vis* conventional services are less significant than benefits for patients. Health professionals would benefit far less from the reduced travel and easier schedule while no study has, to the best of our knowledge, proved that telehealth could lead to better quality of life for health providers (e.g. because of reduced stress, workload, etc.). By contrast, **patients' lives can change significantly with telehealth, but it is possible for providers to see only changes in routine** [167]**.**

Assumption 1

Patients and health professionals accept telehealth as a valuable complementary to but not a full replacement of conventional health services upon the condition that certain requirements are met.

The questionnaires should not only seek to test this hypothesis but should also identify **the factors that affect patients' and professionals' perception of telehealth with a view to understanding which factors contribute to considering telehealth as a valuable complementary to conventional care**.

Some studies suggest, for instance, that **patients may prefer using telehealth if it enables more frequent contact with professionals** [3, 27]. Patients also seem to find telehealth as a good solution for overcoming many barriers they regularly face while seeking medical care since it allows them to work around distances, travel time, and scheduling issues that can occur while seeking specialist care [5, 9, 10, 26]. Aside from the elimination of the challenges, patients additionally appreciate the support options presented by telehealth.

Assumption 2

In principle, patients prefer telehealth if it enables more regular and frequent contact with health professionals.

Direction for further investigation

Future research investigating patients' perspectives of telehealth needs to provide additional insights into the perceived benefits of telehealth with a view to understanding whether the latter can contribute to overriding patients' concerns.

Knowledge Gap 1

The questionnaire for health professionals needs to shed some light on whether health professionals would use telehealth if this enabled them to stay more in touch with their patients.

Some of the papers reviewed by the CoT consortium revealed that **doctors do appreciate certain attributes of telehealth, particularly its ability to speed up patient referrals** [58, 59], **offer the ability to examine high quality diagnostic images** [71], **and expert opinions on a more flexible timetable** [57]. As far as nurses are concerned, it was found that this group of professional users seems to particularly appreciate the possibility of **continuing the therapeutic relationship** with patients [92] and delivering nursing services in a timely manner to the patients in need [164]. They also state that the introduction of ICT may lead to a decrease in work-releated stress because of reduced travelling time and home visits [110].

Direction for further investigation

Future research needs to provide additional insights into the perceived benefits of telehealth by professionals with a view to understanding whether the latter can override their concerns.

2.2 User Satisfaction with telehealth

Satisfaction with the healthcare received is a crucial part of health-related quality of life. Based on the available research one can argue that **both patients and providers appear to be generally satisfied with telehealth services** [6, 8, 14, 20, 25, 26, 53, 88, 112, 114, 128, 133, 138, 144, 147]. Providers, however, have specific concerns to address, many of which could be resolved through more effective training [167]. Additionally, the two groups, i.e. patients and professionals, tend to maintain very different motivations for their opinions. Patient satisfaction varied between studies and is very much related to the results of their treatment.

One interesting review of scientific studies which explored user satisfaction with telehealth, pointed out that when assessing user satisfaction in this field one needs, however, to bear in mind that the construct of satisfaction is largely undefined, unclear and its understanding depends upon **rather subjective** considerations of what can be labelled as being actually "satisfactory" **[**167]. Thus, the very meaning of the word "satisfaction" can be a challenge. Some users define being satisfied simply as receiving adequate care, others use the term to mean less than adequate, that some aspects of healthcare could be better. For others, satisfaction refers to care that is less than optimal. In other cases, using the term "satisfaction" researchers actually meant another term entirely, for example, satisfaction with or confidence in a telehealth application that would indicate acceptance **[**167]. Although, this indicates a need for clarification in this area, the CoT project will not address this issue due to the limitations in aim and scope. However, this additional degree of subjectivity should be kept in mind during the qualitative analysis of the results.

2.3 Impact of telehealth on patient-professional communication

The literature revealed that there is **no unanimous view** with regard to the impact of telehealth on patient-professional interaction. Many studies have revealed that, although regarded as an acceptable solution, **both patients and professionals have major reservations about using**

telehealth because they feel **that technology-mediated communication** typical of telehealth **would not lead to establishing and maintaining the type of provider-patient relationship** that would allow treatment to be effective [1, 29, 71, 90, 128]. Those who perceive telehealth services negatively tend to place emphasis on the fact that technology-mediated communication results in patients becoming "objects" of healthcare as telehealth is thought not to enable healthcare providers to capture patients' emotions and feelings during consultations, thereby neglecting the importance of psychological factors in the whole process [1]. Some studies involving patients' experts and representatives of patient organisations have reported in that respect that telehealth can risk to "fragment" the patient into pieces of "information" that are detached from ways of knowing and understanding the patient relationally, as a human and social being [**9**].

Healthcare professionals seem to be **more concerned than patients** about the negative effects of technology-mediated consultation on communication and appear to demonstrate greater discomfort during telehealth consultation [**127**]. However we also know that, telecare leads to more frequent and more specialised contacts between nurses and patients [**100, 101**]. Even though some studies have highlighted that patients have some concerns with the lack of direct communication with health professionals, **patients consistently demonstrate more positive views** of the telehealth encounters than professionals [**1, 6, 29, 35**].

The perception of telehealth treatment as being **impersonal** is a primary barrier to considering it as an option for both professionals and patients [**1**]. However, while "impersonality" of telehealth consultations seems to be a surmountable barrier for the patients – provided that telehealth yield other benefits [**26**] – professionals continue to regard this element as one of the main reasons why they **maintain a strong preference for face-to-face** visits, despite the fact that the majority of professionals who have used some form of telehealth have reported relatively high levels of satisfaction with this services [**5**, **21**].

This seems to suggest that no matter how efficient and reliable a telehealth-based encounter is, it cannot fully replace real face-to-face contact between professionals and patients. This holds particularly true for professional users and only partially true for the patients [**2**, **13**, **14**, **81**, **104**, **110**, **165**]. For example, the evidence showed that while elderly patients accepted technology and enjoyed self-monitoring, losing face-to-face contacts with health professionals was not an option for them. A combination of home telecare and in-home visits was singled out as the best choice [**112**]. This is also confirmed by a studies focusing on nurses experience with telehealth. Nurses involved in these stiudies acknowledged that the use of ICT in home nursing can be a valid complement to communication but it cannot replace physical encounters [**110**].

Assumption 3

Patients and health professionals perceive telehealth consultations as "impersonal". The impersonality inherent in any telehealth consultation is, however, not an insurmountable barrier especially for the patients and to a lesser extent for professionals. The online survey should aim at validating this assumption trying to investigate which factors could help patients and health professionals overcome this barrier. Specific attention should be paid to understanding why for health professionals impersonality represents one of the main reasons for not accepting telehealth as a valuable alternative to conventional healthcare.

Patients seem to have some concerns regarding professionals' ability to fully capture their physical and emotional situation in technology-mediated consultations. We have no detailed information on whether health professionals feel confident about their ability to capture patients' physical and emotional situation during a telehealth encounter. However, a common issue that the nurses face when using telephone devices is the inability to see the person experiencing the symptoms in making assessments and providing advice and recommendations [**98**]. For this very reason some

studies have highlighted that nurses need knowledge about how interpersonal communication and nursing practice need to be modified when distance and technology are inserted between the patient, the doctor and the nurse [**126**].

Assumption 4

Patients have concerns regarding professionals' ability to fully capture their physical and emotional situation in technology-mediated consultations.

Knowledge Gap 1

We should find out whether health professionals feel confident about their ability to capture patients' physical and emotional situation during a telehealth encounter.

Some studies showed that **patients believe that telehealth can promote patient—centred communication**, while others have reported that **telehealth encounters tend to be conducive to a more paternalistic approach** towards the patients [**166**]. Thus, one can argue that patient-centredness is a highly subjective issue as well. One article that was reviewed argued that the relationship with patients and health professionals in the context of telehealth is hardly different from the context of conventional healthcare. Accordingly, providers' utterances are predominant in the communication as well as task-focused rather than socio-emotional focused similar to the conventional patterns [**166**]. Some studies have highlighted in this respect that when patients establish a **trusting relationship** with the professionals and experience that the element of trust is confirmed in the communication that takes place between them, telehealth is considered as a mean of communicating their concerns to the doctor in a more comprehensive and thorough way [**3**]. It also seems that more trustworthy relationships were developed among nurses and doctors who cooperated through a teleconsultation system [**112**, **124**].

Knowledge Gap 2

The questionnaires should try to provide some answers as to whether both patients and professionals believe that telehealth can promote more patient-centred communication (as well as whether professionals would be in principle inclined towards more patient-centred communication).

2.4 Confidence about using telehealth services

2.4.1 Confidence to oneself in using telehealth

The literature review confirmed that **competence and confidence are key variables influencing acceptance** of a telehealth service, especially for the patients. The latter are on average less educated than health professionals and have a wide range of capabilities and limitations. Users' abilities to adapt to new technologies and become familiar with its operations vary considerably. Some might need intensive training, while some others might not. Some users with functional or age-related limitations may not be able to achieve sufficient competence and acceptance levels.

One of the most common barriers to physicians' and nurses' acceptance of telehealth is a perceived lack of necessary knowledge and skills. We know that, for instance, some home care nurses lack confidence in their skills and knowledge to use the technology to perform home care tasks [**107**, **116**]. Also, even though they have a positive attitude towards the use of information and communication technology in their work, district nurses ask for possibilities to influence the design and its introduction pointing out the importance of ICT being simple, user-friendly and suitable [**110**]. This is linked to the lack of appropriate training, both within their academic curricula and training provided to them during the working period. This lack of appropriated knowledge is

perceived as having potentially negative impacts on their ability to integrate telehealth in the clinical workflow while ensuring efficiency.

On the other hand, self-confidence is known of being something that can be increased over time. In one of the studies reviewed, confidence was found to be a predictor of self-management behaviours. Moreover, increasing self-confidence was observed over time in the patients who used a video-based telehealth system [**163**].

Some studies suggest that patients are not comfortable using telehealth due to their perceived lack of skills to use these services [**107**]. However, there were studies suggesting otherwise as well [**64**]. Interestingly, while **most patients seem to be quite confident about their own ability to understand information provided by doctors and nurses during a telehealth encounter**, **health professionals seem to be less confident about patients' ability to understand instructions and advices received through telehealth** [**127**]. However, there is enough evidence that "**technology-related anxiety**", which is referred to as a negative psychological reaction to technology, has a significant negative impact on attitude and intention to use telehealth, especially for the patients [**15**, **20**, **34**, **37**]. Nurses acknowledge the role that telehealth plays with patients who normally **report feeling** less anxious because they can see (telemonitoring at home) and understand their own readings and worry less.

Direction for further investigation

Future research should provide insight to wheather most patients are confident about their ability to understand information received by doctors and nurses during a telehealth encounter.

Assumption 5

Patients and health professionals are concerned about their ability to use and interact with telehealth services.

Direction for further investigation

Future research should help clarify whether their lack of self-confidence in using telehealth servicesis associated with their initial use of telehealth and can be overcome with experience gained over time.

2.4.2 Confidence in each other in using telehealth

As the patient-professional relationship changes dramatically with the use of telehealth services, with a great deal of communication taking place remotely in a more "de-personalised" manner, it is fundamental that both patients and professionals trust each other. A key determinant for achieving trust is certainly patients' and health professionals' perception of each other having the necessary competence to and confidence with use the service. Although far less explored in the literature, some of the reviewed studies highlighted that this dimension represents a major determinant of users' cognitive perception of a telehealth service, and as such a key driving force behind user acceptability [**3**].

In order to accept a telehealth service, **a user would need to feel confident about the effective capability of other users he/she is interacting with within the same service, to use it properly and ensure the highest standards of safety and quality**. It is clear that this dimension of user confidence also raises important ethical issues, according to which, for instance, an individual, whether a patient or health professional, should not be obliged to use telehealth if he/she is not confident that the other users feel comfortable performing tasks within the same service, as this might not only

severely hinder safety and quality of care, but also undermine mutual trust among different user groups [**60**].

The few studies that have explored this issue indicate that **patients seem to be particularly concerned about health professionals' overall acceptance of telehealth services and their ability to provide adequate care through telehealth** [**86**]. Some studies, for instance, revealed that given that most doctors and nurses are usually very busy, patients expressed concerns about whether they can actually **provide them all the support they would need** [**34**]. Other studies highlighted the issue of patient's concerns about the doctor's decision being based on a limited number of measurements as not all measurements that are taken during in-patient visits can be taken in a telehealth environment [**34**]. Some studies have reported that patients are sometimes concerned about the expertise of the professionals monitoring their condition [**124**]. Accordingly, they declared that **they would use telehealth only if they knew all the professionals involved in looking after them** [**3**].

On the other hand, one must keep in mind that this is a highly subjective and context-specific issue, since some other studies suggest that the patients are quite satisfied with the physicians' ability to use telehealth [**8**].

Assumption 6

Patients are concerned about the expertise of the professionals who manage and monitor their health status through telehealth while health professionals are concerned about patients' ability to use and interact with telehealth services.

Assumption 7

Patients are concerned about the ability of health professionals to draw conclusions on the basis of information exchanged via telehealth.

Direction for further investigation

In the future it should be investigated if patients accept telehealth only if they personally know all the professionals involved in looking after them through telehealth.

Likewise, in various studies focussed on health professionals' perspective we found out **that doctors and nurses seem to be concerned about patients' ability to use specific telehealth applications and thus, they tend not to trust them**, nor do they seem particularly willing to transfer additional responsibilities for self-management to their patients – an element which is inherent in many telehealth services [**97**]. Some of health professionals' lack of trust on the patients seems to be one of the major barriers to their acceptance of telehealth. A study focused on nurses' perspective also described nurses' concerns that the use of ICT at home could bring difficulties and uncertainties in retaining a holistic perspective on nursing care and in obtaining important information on the patient as well as the possibility that the use of ICT could be frightening, especially for older people [**110**]. Other studies have, however, arrived at different results showing **health professionals' inclination towards entrusting the patients with more responsibility for self-care**, thereby indicating a positive attitude towards patient empowerment.

Assumption 8

The questionnaire for health professionals should explore whether health professionals think that patients are sufficiently competent to use telehealth tools.

Direction for further investigation

Future research should clarify if health professionals have concerns about patients' ability to understand instructions and advices given through telehealth.

Direction for further investigation

Future studies should also investigate whether health professionals are in principle willing to transfer certain responsibilities for self-care to the patients and whether they regard this as a positive aspect that could strengthen their overall trust on their patients while improving their (i.e. health professionals') acceptance of telehealth.

Assumption 9

Patients are willing to change their role in care provision, becoming a more active player instead of just accepting what physicians recommend.

2.5 Access to healthcare

The literature review suggests that, in principle, both professionals and patients agree on telehealth being advantageous due to bringing treatment options that are currently unavailable [**1**]. The literature shows that rural patients consistently appreciate not having to travel great distances for certain consultations [**9**, **34**, **62**, **74**]. Some studies show that even though the patients recognise the lack of face-to-face contact as a trade-off, they would still sacrifice the in-person contact thinking that it is worth the improved access to specialists [**2**, **5**, **13**, **25**, **34**]. Even though they are not satisfied with it as much as face-to-face contact with patients, doctors also support the use of telehealth in rural settings [**165**].

However, other studies focused on patients' perspective revealed that despite claims about greater access to healthcare provision and information through telehealth and ICT in general, current inequalities in access would persist or even be exacerbated [**9**]. **Patients seem to be concerned that current socio-economic, gender and e-health literacy inequalities can negatively affect the impact of telehealth on addressing existing health inequities** due to the risk that only better-off patients might benefit from telehealth introduction in routine healthcare practice.

We have no information as to whether health professionals believe that telehealth can improve access to healthcare by enabling them to provide care to patients living in under-served areas. It would be interesting to know whether a positive view on this aspect could represent an enabler to further promote health professionals' acceptance of telehealth.

Assumption 10

Patients believe that telehealth can in principle lead to greater access to healthcare, particularly for vulnerable patient groups or patients living in underserved areas. However, if certain conditions are not fulfilled (i.e. costs of telehealth vis-à-vis conventional care, eHealth literacy, interoperability), patients believe that inequalities in access would persist or even be exacerbated by the introduction of telehealth.

Knowledge gap 3

The questionnaire for health professionals should provide some indications as to whether or not telehealth could improve access to healthcare by enabling them to provide care to vulnerable patient groups or patients living in under-served areas, and if so whether they think that such increased accessibility represents a factor that could strengthen their acceptance of telehealth.

2.6 Data protection, privacy and confidentiality

The implications of telehealth for patient's privacy, confidentiality and protection of sensitive personal data are well known. The continuous monitoring nature inherent in many telehealth services can as a matter of fact prove to be an infringement of patients' rights to privacy and this constitutes one of the major barriers to patient's acceptance of telehealth [**23**, **57**, **64**, **86**, **90**, **105**].

Our literature review confirmed that patients will not accept telehealth if this can put at risk their right to confidentiality. Confidentiality is closely related to privacy, but not identical. It refers to the obligations of individuals and institutions to use information under their control appropriately once it has been disclosed to them.

Concern about possible threat to data confidentiality remains a major barrier to patient's acceptance to telehealth even though the patients who participated in telehealth pilots included have rarely listed threat to data confidentiality as one of the amongst the issues about which they are concerned the most [**12**, **29**, **34**, **42**, **60**, **76**, **105**, **112**].

Patients tend to have different views with regard to their right to "privacy" and the way this can be affected by telehealth. Originally understood as simply "the right to be left alone", nowadays privacy is more broadly thought of as describing conditions of limited accessibility to various aspects of an individual - both physical and informational. Definitions of privacy include the capacity to be physically alone (solitude); to be free from physical interference, threat or unwanted touching (assault, battery); or to avoid being seen or overheard in particular contexts. Privacy also encompasses the concept of confidentiality when it refers to the capacity to control when, how and to what degree information about oneself is communicated to others. The literature review directs us to the conclusion that privacy is also one of the main barriers for the adoption of telehealth especially from the patients' side [**14**, **64**, **69**, **86**].

Some studies revealed that patients could be willing to compromise on certain "soft" aspects of their privacy, notably aspects such as the capacity to be physically alone with limited external interference – which tend to be affected by highly intrusive services such as telehealth – if telehealth would prove to yield other benefits. An interesting study revealed in this respect that older patients may be willing to "trade" certain aspects of privacy in exchange of other telehealth benefits like, for instance, increased independence [**4**].

There is far less information on professionals' perception on the impact of telehealth on privacy and confidentiality. The studies that address this aspect highlighted that most health professionals did not express any concern about potential threats to confidentiality – suggesting that they tend to regard telehealth at least as secure as more conventional health services. For example, in a study where patients' emails were pooled and then sent to the relevant doctor, two thirds of the patients in the felt uncomfortable with clinic staff triaging their messages, while most physicians favored this arrangement [**69**]. However, the doctors who did bring up the issue were very concerned [**105**, **112**, **125**].

Knowledge gap 4

The Chain of Trust project should also investigate whether telehealth has always some impact on patient's privacy and whether patients would be ready to relinquish certain aspects of their privacy if telehealth leads to other perceived benefits, and if so which benefits, i.e. more independence, improved quality of life and health status, etc.

Knowledge gap 5

The questionnaires should provide some answers as to whether patients and health professionals

are concerned about threats to data confidentiality in telehealth.

2.7 Quality of care

Another claimed benefit of telehealth is the contribution to better quality of care [**60**]. Among the telehealth user groups dealt with in this literature review, nurses have **general positive perceptions** when using telehealth services because they appreciate the fact that it can improve the therapeutic relationship with patients and this contributes towards providing better quality healthcare to the patient [**111**, **117**, **122**]. They also believe that, used properly, telehealth could **relieve nurses of some of the burdens** without compromising patient care [**117**]. Some other studies pointed out, however, that nurses have same concerns about that the use of ICT at home could bring along difficulties and uncertainties that could compromise quality in delivering healthcare [**110**]. Although limited, we also have information that doctors [**78**] and pharmacists also agree that telehealth increases the quality of care [**136**].

Similarly, while many studies have demonstrated that patients believe that telehealth can lead to better quality of care and promoting care of the whole patient [**6**, **12**, **29**], some others have reported some concerns about maintaining the same standard of quality if healthcare is provided at a distance [**80**].

Assumption 11

Health professionals and patients believe that telehealth do not compromise quality of care delivered to the patients.

2.8 Effectiveness, safety and reliability

2.8.1 Effectiveness

Effectiveness (utility), sometimes referred to as usefulness, refers to the ability of a service to perform the task(s) for which it was originally conceived. Our literature review pointed out that one of the factors that contribute to healthcare professionals' acceptance of telehealth is the clinical utility and ease of use of telehealth applications and the possibility to enable timelier and faster diagnosis and treatment, and lead to overall better efficacy of healthcare. The review revealed that doctors are more interested in understanding the clinical effectiveness of telehealth services [**78**]. By clinical effectiveness we mean the performance of a service in regular clinical practice in terms of ability of the technology to generate specific pre-determined clinical outcomes.

When emergency is the case, patients seem to prefer telehealth since it speeds up the process, for instance, in wound assessment [**6**]. The doctors who have used telehealth seem to be satisfied with the clinical effectiveness of telehealth services and applications although some expressed concerns as the effectiveness of telehealth in critical/emergency situations. An interesting study, although it recommends the use of telehealth (especially video-conferencing) in cases of emercengy and trauma, claimed that ad hoc applications of telehalth in cases of emergency can cause problems if brought up without preparation [**46**]. In other studies, doctors listed telehalth as a very effective tool in emergency situations [**71**]. These aspects, including cases of emergency, will need to be investigated more in detail trying to capture the perspective of health professionals who have not used telehealth.

Knowledge gap 6

The questionnaires on health professionals need to explore the perceived clinical effectiveness of telehealth.

Knowledge gap 7

Patients' perception of clinical effectiveness has been far less explored in the literature on users' perspective. It can be reasonably assumed, however, that a patient being treated through telehealth would expect that a health professional can draw the same, correct conclusions using the telehealth service/application as he/she can decide from a face-to-face consultation and using standard medical devices and IT support. The questionnaire for patients should also try to clarify this issue.

2.8.2 Safety and reliability

Unless coupled with safety and reliability standards clinical effectiveness will not contribute to health practitioners' acceptance of telehealth on its own. Reliability, sometimes also referred to as dependability, is commonly defined as the probability that a device, service, or process will perform its prescribed task without failure for a given time when operated correctly in a specified environment.[1]

The literature review indicated that safety issues associated with telehealth are far more complex than in conventional care, and include not only apprehension about malfunctioning equipment which could occur in relation to any medical device, but also concerns regarding potential adverse effects on patient management decisions through delayed, inaccurate, or missing information, misunderstood advice, or inaccurate findings due to patient or healthcare professional error. Our review highlighted that safety and reliability-related issues currently represent one of the main barriers to telehealth acceptance, especially for health professionals [**80**, **90**]. Patients are also concerned about safety and reliability, especially with regard to accountability and legal responsibility in case of medical errors that may occur during telehealth interventions [**29**, **60**]. On the other hand a few studies showed that telehealth actually improve patient safety [**57**, **136**]. In this sense, one example is telepharmacy. Accordingly, the orders being reviewed more carefully by pharmacists increase patient safety and the quality of service provided [**136**, **139**].

Assumption 12

Health professionals and patients will accept telehealth services only in so far as and as long as they prove to have at least the same safe and reliability standards as more traditional health services.

Direction for further investigation

Future research should investigate whether patients are concerned about accountability and legal responsibility in case of medical errors that may occur during telehealth interventions.

2.9 Organisational aspects

The literature review confirmed that **organisational aspects represent one of the most significant obstacles for telehealth acceptance, particularly for professionals**. Telehealth always entails a change in routine and it is not clear whether this really corresponds to what health professionals

[1] RENEWING HeALTH. 2011. D4.1 User Requirements - Reference Framework P.24. Retrieved from http://www.renewinghealth.eu/files/RH/Documents/WP/D4.1-v1.0-Renewing-Health-User-Requirements-Ref-Framework.pdf, on July 6, 2011.

actually want. Accordingly, change usually implies that something is not working optimally and this contrasts with some professionals' feeling that they are already providing the best care to their patients. Indeed, some studies claimed that health professionals resist to the adoption of telehealth more than the patients [**88**, **90**, **165**].

The review suggests that **healthcare professionals would accept change in routine resulting from the introduction of telehealth services as long as it enables them to perform their tasks more quickly, more accurately and that their overall work productivity is increased** [**79**, **159**]. For instance, due to increasing service capacity and enabling patients to manage their own care, **telehealth can ease the burden on National Health Systems resources** [**97**]. Moreover, telehealth services avoid the need to travel to specialist centres **enabling primary care clinicians to consult specialists remotely to avoid unnecessary referrals and travel**, and offer support to clinical and educational networks to reduce professional isolation, share best practices and enhance continued professional development [**99**]. Specific types of services like video-conferencing could also allow the clinical staff on the transport team, and in the critical care centres, the opportunity to view the patient and advise the local team. Rather than putting patients and nurses at a distance, all examples pointed in the opposite direction: it made them feel closer to one another.

However, both doctors and nurses seem to be **concerned about the potential for extra work due to telehealth** (i.e. more frequent consultations, need to keep up with many alerts, difficulties in coordinating the provision of telehealth for some patients while continuing to delivering standard care to other patients) [**88**, **100**, **104**] **and lack of proper training** [**96**, **121**, **129**]. Nurses seem to be particularly concerned about the increase in workload brought about by the introduction of telehealth [**100**].

Assumption 13

Health professionals would agree that telehealth leads to improved cooperation among fellow health professionals.

Assumption 14

Health professionals will accept a change in routine - inherent in the introduction of telehealth - as long as it enables them to perform their tasks more quickly, more accurately and that their overall work productivity is increased.

Assumption 15

Health professionals are concerned about potential for extra work due to telehealth.

From the perspective of patients, the **potential of intrusiveness is one of the downsides of telehealth**, e.g. preventing the patient conducting his/her daily life because of tele-homecare related duties, such as frequent or untimely measurements and consultations, or unwanted disclosure from private life [**15**]. However, there is a certain lack of information in the literature regarding patient's perspective on potential negative aspects linked to telehealth intrusiveness.

Knowledge gap 8

The questionnaire for patients should try to provide answers as to whether patients perceive telehealth as intrusive and if so whether they would adopt telehealth despite its intrusiveness in exchange of other perceived benefits.

2.10 Economic aspects

Undoubtedly, one of the most important barriers against the large-scale deployment and sustainability of telehealth is the lack of adequate reimbursement regulations favouring health professionals. More than a decade-old, this problem is still a main rejection of telehealth by doctors. The review confirmed that as long as telehealth services do not become an integral part of the reimbursement schemes of public or statutory health insurance based services as well as of the reimbursement schemes of private health insurers, health professionals have either the risk of not being allowed to practice telehealth by their employer, or of losing their own money in a self-employed setting [**52**, **57**, **64**, **72**, **73**, **85**, **92**]. This currently represents one of the major barriers to telehealth acceptance and adoption by health professionals.

Assumption 16

Health professionals will not accept telehealth as long as telehealth services do not become an integral part of the reimbursement schemes of public or statutory health insurance based services, as well as of the reimbursement schemes of private health insurers.

There is a quite strong consensus among patients – as well as health professionals – on the fact that telehealth can yield important economic benefits due to the possibility to reduce travel expenses for ambulatory visits as well as travel expenses for relatives caused by hospital stays, but also through the minimisation of the time off work caused by the healthcare for their illness [**9**, **10**, **26**, **62**, **99**, **106**, **110**, **113**, **128**, **141**, **159**, **164**].

Assumption 17

Patients think that telehealth leads to the reduction of direct (less visits, travels) and indirect costs (less hours spent off work) for healthcare.

Knowledge gap 9

The questionnaire on patients should also address the following issue: since patients get something in return, i.e. improved quality of life, more independence, etc., are they ready to pay more for telehealth services?

2.11 Clinical, health-related and patient outcomes

2.11.1 Health condition and quality of life

Quality of life (QoL) is a general concept referring to the overall well-being of individuals. On the other hand, QoL is used with a more specific meaning when health is concerned. Accordingly, "health-related quality of life (HRQoL) includes the physical, functional, social and emotional well-being of an individual" and it is a patient-reported outcome.[2]

Literature review showed that one of the patients' key concerns when deciding on whether to accept using telehealth is an improvement of their own health status as well as their quality of life through a better approach to the management of their condition. A study indicated, for instance, high consensus among patients that being aware of their health condition and the ability to have their health conditions regularly monitored could give them peace of mind and reduce the feeling of

[2] Lesley Fallowfield. 2009. "What is quality of life?" What is...? series. Second edition. Retrieved from http://www.medicine.ox.ac.uk/bandolier/painres/download/whatis/WhatisQOL.pdf on July 6, 2011.

isolation while improving their overall quality of life [**34**].

It would be equally interesting to know whether health professionals think that telehealth can improve patients' quality of life and if so whether this could be a factor that could contribute to strengthening their (i.e. health professionals) acceptance of telehealth. Studies focused on nurses' perspective highlighted that nurses believe that telehealth can improve patients' quality of life and this is perceived as an important outcome for the nursing community [**117**, **120**, **125**]. Furthermore, from the nurses' perspective, the use of ICT could decrease stress because of decreased travelling time and home visits[**110**]. One of the studies also pointed out to the highly improved quality of life of pharmacists due to eliminating certain manual work [**139**].

Assumption 18

Patients believe that telehealth can lead to better quality of life also because of improvement of their health status (e.g. reduced morbidity, reduced mortality risk) and the fact that telehealth allow for the continuous monitoring of their condition.

Knowledge gap 10

The questionnaire on health professionals should explore whether health professionals think that telehealth can improve patients' quality of life and if so whether they value this as a positive outcome of telehealth and as such whether it could be a factor that could contribute to strengthening their (i.e. health professionals) acceptance of telehealth.

2.11.2 Patients' adherence

Sometimes called patient compliance, patient adherence means "the extent to which a person's behaviour coincides with medical or health advice, such as taking medication regularly, returning to a health professional's office for follow-up appointments, and observing preventive and healthful lifestyle changes".[3] Despite the positive health benefits that adherence engenders, however, many patients fail to adhere or comply to advices given by health professionals for a variety of reasons. There are various types and reasons for non-adherence. For instance, "the five most common types of nonadherence with medication are: 1) failing to have a prescription filled, (2) taking an incomplete dose,(3) taking the medication at the wrong time, (4) forgetting to take one or more medications, and (5) stopping the medication".[4]

Among the claimed benefits of telehealth there is the increase of patients' adherence to treatments, medications, recommendations and nutritional regimes [**119**, **145**]. If this assumption holds true we could reasonably conclude that **health professionals would be more willing to accept telehealth since patient adherence is amongst healthcare providers' primary concerns**. Fewer physician office visits, reduced hospitalisation rates, or fewer emergency room visits are only a few out of many relevant outcomes indirectly derived from increased medication adherence. Only one study has, however, focused on professionals' perspective on whether they think that patients' adherence can improve as a result of using telehealth [**63**].

Similarly we should be able to draw some conclusions as to whether patients think that telehealth could improve their adherence through treatment and whether they would value this as a positive outcome of using telehealth, thereby strengthening their acceptance of this kind of services.

Knowledge gap 11

[3] http://www.enotes.com/public-health-encyclopedia/adherence-compliance-behavior

[4] *Ibid.*

The questionnaire for health professionals should explore whether they believe that telehealth can improve patients' adherence and if so whether this could strengthen their acceptance of telehealth.

Knowledge gap 12

The questionnaire for patients should provide some answers as to whether patients believe that telehealth can help them improve their adherence to treatment and if so whether they would regard this as a factor that may strengthen their acceptance of telehealth.

2.11.3 Patients' empowerment

An aspect that is often overlooked in many studies on users' perspective of telehealth is whether the patients think that telehealth could help them improve their knowledge of their health condition and, likewise, whether health professionals, in turn, think that this is the case and that is something that should be regarded as a desirable outcome of telehealth.

Assumption 19

Patients believe that telehealth can help them improve their knowledge of the condition(s) they suffer from.

Knowledge gap 13

The questionnaire for health professionals should provide some answers as to whether health professionals believe that telehealth can help patients improve their knowledge of the conditions and treatment, and if so whether they would regard this as a desirable outcome of telehealth.

Increasing knowledge on the health condition is a pre-requisite for patient empowerment. Although an important aspect, only a few studies have explored the issue of whether or not the patients being willing to play a more empowered role in healthcare and whether they think that telehealth can enable them to do so.

Some studies reviewed by the Chain of Trust consortium indicated that **patients are in principle willing to play a more active role in managing their condition** and that telehealth can be a tool for promoting active participation in their health management and **empowering them to perform better self-care** [**22**, **34**, **97**, **106**, **118**, **120**, **122**]. Other studies, however, arrived at different conclusions highlighting that the perceived acceptance by patients of taking on greater self-management varied and in general reference to traditional roles of patients and healthcare professionals – and the maintenance thereof – remained prevalent [**9**].

Assumption 20

Patients are willing to play a more empowered role in healthcare.

Knowledge Gap 14

The questionnaire for the patients should provide some answers as to whether the patients think that telehealth can enable them to play a more active role in health care and if they want to take more responsibility shedding some light on whether they think that traditional roles of patients and healthcare professionals should be reconsidered or maintained in telehealth.

3. General Remarks and Conclusion

This literature review revealed that the number of barriers to telehealth services' uptake seems to be higher for health professionals than for patients. Accordingly, our research points to the direction that, **in principle, patients may be more inclined than professionals to accepting telehealth as a complement to conventional care** upon the condition that certain requirements are fulfilled.

The literature review also seems to indicate that the major cause behind this is the fact that as far as health professionals are concerned, the number of perceived benefits of telehealth is outnumbered by the perceived barriers, while as far as the patients are concerned the other way round seems to apply. This does not come as a big surprise though as **the number of potential perceived benefits associated with telehealth we came across is higher for the patients than for professionals**. While patients could benefit in many different ways from telehealth – i.e. improved quality of life, reduced travel and easier schedule, better health status, increased independence, etc. – benefits of telehealth for health professionals *vis-à-vis* conventional services are less significant. Accordingly, **health professionals may be benefiting less** from the reduced travel and easier schedule while very few study has, to the best of our knowledge, proved that telehealth could lead to better quality of life for health providers (e.g. because of reduced stress, workload, etc.). By contrast, **patients' lives can change significantly with telehealth**, but **it is possible for health professionals to see only changes in routine**. **Change always implies that something can be improved**. Furthermore, our literature review showed that **it is not clear whether the claimed benefits of telehealth are perceived as such by health professionals** themselves and this may explain, to some extent, a certain resistance to accepting telehealth and, hence, integrating it in their daily practices. On the other hand, one should keep in mind that reduced number and intensity of benefits due to telehealth does not mean that telehealth is insignificant for healthcare professionals. Our literature review revealed many organisational benefits that urge health professionals use telehealth services.

Patients seem to find telehealth to be a good solution to overcome many of the barriers they regularly face while seeking healthcare. Patients believe that telehealth allows them to work around distances, travel time, and scheduling issues that can be common while seeking specialist care. Aside from removing challenges, patients additionally appreciate the support options presented by telehealth. Being able to simultaneously consult one's general practitioner and a specialist opens for instance a comprehensive method of care that is unavailable from seeing the two separately.

We need to take into account, however, that these general findings are affected, *among others*, by two main factors, namely the fact that:

a) telehealth services investigated within our review range from as basic services as simple patient-professional telephone consultations to more complex services for remote patient monitoring and chronic disease management with high degrees of shift of responsibility for managing the condition from professionals to patients

b) studies reviewed are very different from each other and not all sources reviewed offer generalisable results.

Last but not the least, the review suggest that a different conclusion needs to be made for pharmacists. Literature review shows that the majority of studies on telehealth have **overlooked the involvement of pharmacists and that the policies regarding telemedicine have failed to specify the role of the pharmacist**.

Based on the analysis presented above, the objectives of the Chain of Trust online survey should be to provide:

a) a **clarification of what the perceived and actual benefits and barriers of telehealth are**, especially for the professional users as existing knowledge is far less advanced *vis-à-vis* non-professional users

b) **information as to whether the various user groups are willing to compromise on certain "perceived" negative aspects associated to telehealth** (see the detailed analysis below) **in exchange of "perceived" benefits.** This entails understanding "**trade-offs"** between various priorities for patients and professionals and explore whether potential concerns can be overridden by other factors, i.e. higher fulfilment of their health and medical needs for the patients, higher clinical effectiveness and professional satisfaction and fulfilment for professionals.

Although many of the findings on doctors' and nurses' perspectives on telehealth might in principle apply, to some extent, to pharmacists as well, the perspective of the latter is far less explored in the literature. This means that the future Chain of Trust activities will need to target this user group on a more general level, looking at the perceived causes behind such a limited involvement of pharmacists in telehealth (or *tele-pharmacy*), exploring the general perception of pharmacists and perhaps testing, to the extent possible at the present, some hypotheses on doctors' and nurses' perception with a view to understanding whether and if so to what extent could general views and attitudes of the latter groups apply to other health professional groups, namely the pharmacists.

References

1 Swinton JJ, Robinson WD, Bischoff RJ. **Telehealth and rural depression: Physician and patient perspectives**. Families, Systems, & Health, Vol 27(2), Jun 2009, 172-182.

2 Jacob Anhøj and Lene Nielsen. **Quantitative and Qualitative Usage Data of an Internet-Based Asthma Monitoring Tool**. Journal of Medical Internet Research, 2004 Jul–Sep; 6(3): e23.

3 Andreassen HK, Trondsen M, Kummervold PE, Gammon D, Hjortdahl P. **Patients who use e-mediated communication with their doctor: new constructions of trust in the patient-doctor relationship**. Qualitative Health Research 2006 Feb;16(2):238-4.

4 ED Mynatt, Melenhorst AS, Fisk AD, Rogers WA. **Aware technologies for aging in place: understanding user needs and attitudes.** IEEE Pervasive Computing 2004;3:36-41.

5 Robert H Eikelboom and Marcus D Atlas. **Attitude to telemedicine, and willingness to use it, in audiology patients.** Journal of Telemedicine and Telecare 2005;11:22-25.

6 Hyungjin Myra Kim, Julie C. Lowery, Jennifer B. Hamill and Edwin G. Wilkins. **Patient Attitudes Toward a Web-based System for Monitoring Chronic Wounds.** Telemedicine journal and e-health, Volume 10, Supplement 2, 2004.

7 Wojciech Glinkowski, Magdalena Sawińska. **Attitude Towards Telemedicine - Polish Population Survey.** http://www.mrc.ac.za/conference/satelemedicine/Glinkowski.pdf.

8 Zia Agha, Ralph M. Schapira, Purushottam W. Laud, Gail McNutt, Debra L. Roter. **Patient Satisfaction with Physician–Patient Communication During Telemedicine.** Telemedicine and e-Health. November 2009, 15(9): 830-839.

9 Tracy L. Finch, Maggie Mort, Frances S. Mair, Carl R. May. **Future patients? Telehealthcare, roles and responsibilities.** Health and Social Care in the Community (2008) 16(1), 86–95.

10 Barlow J, Singh D, Bayer S, Curry R. **Current status and future perspectives in telecare for elderly people suffering from chronic diseases.** Journal of Telemedicine and Telecare. 2008;14(4):195-203.

11 Cranen K, Drossaert CH, Brinkman ES, Braakman-Jansen AL, Ijzerman MJ, Vollenbroek-Hutten MM. An exploration of chronic pain patients' perceptions of home telerehabilitation services. **Health Expectations, 2011 Feb 23.**

12 Marie-Pierre Gagnon, Alain Cloutier, and Jean-Paul Fortin. **Quebec Population and Telehealth: A Survey on Knowledge and Perceptions.** Telemedicine Journal and e-Health, Volume 10, Number 1, 2004.

13 Marilynne A. Hebert and Barbara Korabek. **Stakeholder Readiness for Telehomecare: Implications for Implementation.** Telemedicine Journal and e-Health, 2004, Volume 10, Number 1, 200.

14 Paulo Dias Costa, Pedro Pereira Rodrigues, António Hipólito Reis, Altamiro Costa-Pereira. **A Review on Remote Monitoring Technology Applied to Implantable Electronic Cardiovascular Devices.** Telemedicine and e-Health. December 2010, 16(10): 1042-1050.

15 Birthe Dinesen Christian Nøhr, Stig Kjær Andersen, Holger Sejersen and Egon Toft. **Under surveillance, yet looked after: Telehomecare as viewed by patients and their spouse/partners.** European Journal of Cardiovascular Nursing, Volume 7, Issue 3, September 2008, Pages 239-246.

16 Seto E, Leonard KJ, Masino C, Cafazzo JA, Barnsley J, Ross HJ. **Attitudes of heart failure patients and health care providers towards mobile phone-based remote monitoring.** Journal of Medical

Internet Research. 2010 Nov 29;12(4):e55.

17 Agha Z, Roter DL, Schapira RM. **An evaluation of patient-physician communication style during telemedicine consultations.** Journal of Medical Internet Research. 2009 Sep 30;11(3):e36.

18 Chung-Chuan YANG. **Patients' Responses to Emerging Telemedicine Systems in Taiwan.** Retreived at http://www.isoc.org/inet99/proceedings/posters/366/index.htm.

19 Hübbe MJ, Mols M, Holm-Petersen C, Hansen J, Voss H, Danish National Board of Health, Monitoring & Health Technology Assessment. **Use of telemedicine between Rigshospitalet and Bornholm Hospital – Report of a pilot project.** National Board of Health, Danish Centre for Health Technology Assessment, 2010 Health Technology Assessment2010;10(2).

20 Perla Werner. **Willingness to Use Telemedicine for Psychiatric Care.** Telemedicine Journal and e-health, Volume 10, Number 3, 2004.

21 Eikelboom RH, Atlas MD. **Attitude to telemedicine, and willingness to use it, in audiology patients.** Journal of Telemedicine and Telecare. 2005;11 Suppl 2:S22-5.

22 Verhoeven F, Tanja-Dijkstra K, Nijland N, Eysenbach G, van Gemert-Pijnen L. **Asynchronous and synchronous teleconsultation for diabetes care: a systematic literature review.** Journal of Diabetes Science and Technology 2010 May 1;4(3):666-84.

23 Sheba M. George, Alison Hamilton and Richard Baker. **Pre-experience Perceptions About Telemedicine Among African Americans and Latinos in South Central Los Angeles.** Telemedicine and e-Health. July/August **2009**, 15(6): 525-530.

24 Paula M. Trief, Jonathan Sandberg, Roberto Izquierdo, Philip C. Morin, Steven Shea, Rebecca Brittain, Elizabeth Banks Feldhousen, Ruth S. Weinstock. **Diabetes Management Assisted by Telemedicine: Patient Perspectives.** Telemedicine and e-Health. September 2008, 14(7): 647-655.

25 Thomas F. Bergquist, Kelsey Thompson, Carissa Gehl, Jorge Munoz Pineda. **Satisfaction Ratings After Receiving Internet-Based Cognitive Rehabilitation in Persons with Memory Impairments After Severe Acquired Brain Injury.** Telemedicine and e-Health. May 2010, 16(4): 417-423.

26 Stanley M. Finkelstein, Stuart M. Speedie, George Demiris, Michiel Veen, Jan Marie Lundgren and Sandra Potthoff. **Telehomecare: Quality, Perception, Satisfaction.** Telemedicine Journal and e-Health, Volume 10, Number 2, 2004.

27 Nijland N, van Gemert-Pijnen JE, Boer H, Steehouder MF, Seydel ER. **Increasing the use of e-consultation in primary care: results of an online survey among non-users of e-consultation.** International Journal of Medical Informatics. 2009 Oct;78(10):688-703.

28 Margarita Elkjaer, Mary Shuhaibar, Johan Burisch[1], Yvonne Bailey, Hanne Scherfig, Birgit Laugesen, Søren Avnstrøm, Ebbe Langholz, Colm O'Morain, Elsebeth Lynge, Pia Munkholm. **E-health empowers patients with ulcerative colitis: a randomised controlled trial of the web-guided 'Constant-care' approach.** International Journal of Gastroenterology and Hepatology, 2010;**59**:1652-1661.

29 Joo-Yeon Lee, Yunling E. Du, Osode Coki, John T. Flynn, Justin Starren , Michael F. Chiang. **Parental perceptions toward digital imaging and telemedicine for retinopathy of prematurity (ROP) management.** Graefe's Archive for Clinical and Experimental Ophthalmology, l (2010) 248:141–147.

30 Balk AH, Davidse W, Dommelen P, Klaassen E, Caliskan K, van der Burgh P, Leenders CM. **Tele-guidance of chronic heart failure patients enhances knowledge about the disease. A multi-centre, randomised controlled study.** European Journal of Heart Failure. 2008 Nov;10(11):1136-42.

31 Finch T. **Teledermatology for chronic disease management: coherence and normalization.** Chronic Illness. 2008 Jun;4(2):127-34.

32 Grubaugh, Anouk L. Cain, Gregory D., Elhai, Jon D., Patrick, Sarah L., Frueh, B Christopher. **Attitudes Toward Medical and Mental Health Care Delivered Via Telehealth Applications Among Rural and Urban Primary Care Patients.** Journal of Nervous & Mental Disease. 196(2):166-170, February 2008.

33 Courtney KL. **Privacy and senior willingness to adopt smart home information technology in residential care facilities.** Methods of Information in Medicine. 2008;47(1):76-8.

34 Rahimpour M, Lovell NH, Celler BG, McCormick J. **Patients' perceptions of a home telecare system.** International Journal of Medical Informatics. 2008 Jul;77(7):486-98.

35 Liu X, Sawada Y, Takizawa T, Sato H, Sato M, Sakamoto H, Utsugi T, Sato K, Sumino H, Okamura S, Sakamaki T. **Doctor-patient communication: a comparison between telemedicine consultation and face-to-face consultation.** International Medicine 2007;46(5):227-32.

36 Abrar A. Qureshi, Heather A. Brandling-Bennett, Eve Wittenberg, Suephy C. Chen, Arthur J. Sober, Joseph C. Kvedar. **Willingness-to-pay stated preferences for telemedicine versus in-person visits in patients with a history of psoriasis or melanoma.** Telemedicine and e-Health. December 2006, 12(6): 639-643.

37 Werner P, Karnieli E. **A model of the willingness to use telemedicine for routine and specialized care.** Journal of Telemedicine and Telecare. 2003;9(5):264-72.

38 Christian Thielscher, Charles R. Doarn. **Long-Term Future of Telemedicine in Germany: The Patient's, Physician's, and Payer's Perspective.** Telemedicine and e-Health. September 2008, 14(7): 701-706.

39 Wen-Yuan Jen, and Ming-Chien Hung. **An Empirical Study of Adopting Mobile Healthcare Service: The Family's Perspective on the Healthcare Needs of their Elderly Members.** Telemedicine and e-Health. January/February 2010, 16(1): 41-48.

40 Michael J. Ackerman, Rosemarie Filart, Lawrence P. Burgess, Insup Lee, and Ronald K. Poropatich. **Developing Next-Generation Telehealth Tools and Technologies: Patients, Systems, and Data Perspectives.** Telemedicine Journal and e-Health. 2010 February; 16(1): 93–95.

41 Cusack, C.M., Pan, E., Hook, J.M., Vincent A., Kaelber, D.C. and Middleton, B. **The value proposition in the widespread use of telehealth.** Journal of Telemedicine and Telecare, 14(4):167-168, 2008.

42 Damodaran, L. and Olphert, C.W. **User responses to assisted living technologies (ALTs) — a review of the literature.** Journal of Integrated Care, 18(2), April 2010, pp.25-32.

43 George Demiris, Lawrence B. Afrin, Stuart Speedie, Karen L. Courtney, Manu Sondhi, Vivian Vimarlund, Christian Lovis, William Goossen, and Cecil Lynch. **Patient-Centered Applications: Use of Information Technology to Promote Disease Management and Wellness: A White Paper by the AMIA Knowledge in Motion Working Group.** Journal of the American Medical Informatics Association. 2008;15:8–13.

44 Mair, F., Finch, T., May, C., Hiscock, J., Beaton, S., Goldstein, P. and McQuillan, S. **Perceptions of risk as a barrier to the use of telemedicine.** Journal of Telemedicine and Telecare, (2007), 13 (Suppl. 1): S1: 38–9.

45 King, G., Heaney, D. J., Boddy, D., O'Donnell, C. A., Clark, J. S. and Mair, F. S. **Exploring public perspectives on e-health: findings from two citizen juries.** Health Expectations, Vol. 14, Issue 1.

46 Moehr JR, Schaafsma J, Anglin C, Pantazi SV, Grimm NA, and Anglin S. **Success factors for telehealth – a case study.** International Journal of Medical Informatics, Vol. 75, No. 10-11. (2006), 755-763.

47 Polisena J, Coyle D, Coyle K, and McGill S. **Home telehealth for chronic disease management: A systematic review and an analysis of economic evaluations.** International Journal of Technology Assessment in Health Care, (2009), 25: 339-349.

48 LaFramboise LM, Woster J, Yager A, and Yates BC. **A technological life buoy: patient perceptions of the Health Buddy.** The Journal of Cardiovascular Nursing, 2009 May-Jun;24(3):216-24.

49 Neale R Chumbler, Patricia Quigley, Jon Sanford, Patricia Griffiths, Dorian Rose, Miriam Morey, E. Wesley Ely, and Helen Hoenig. **Implementing Telerehabilitation Research for Stroke Rehabilitation with Community Dwelling Veterans: Lessons Learned.** International Journal of Telerehabilitation, Vol. 2, No. 1 (2010).

50 Johnston B, Kidd L, Wengstrom Y, and Kearney N. **An evaluation of the use of Telehealth within palliative care settings across Scotland.** Palliat Med March 4, 2011.

51 Kidd L, Cayless S, Johnston B, and Wengstrom Y. **Telehealth in palliative care in the UK: a review of the evidence.** Journal of Telemedicine and Telecare, 2010;16:394-402.

52 Tracy J., Rheuban K., Waters R.J., DeVany M., and Whitten P. **Critical steps to scaling telehealth for national reform.** Telemedicine Journal and e-Health, the official journal of the American Telemedicine Association, November 2008; 14(9):990-4.

53 López C., Valenzuela J.I., Calderón J.E., Velasco A.F., and Fajardo R. **A telephone survey of patient satisfaction with realtime telemedicine in a rural community in Colombia.** Journal of Telemedicine and Telecare, 2011; 17(2):83-7.

54 Raymond W. Pong and John C. Hogenbirk. **Licensing Physicians for telehealth Practice: Issues and Policy Options.** Health Law Review, Volume 8, Number 1 (1999).

55 Gianfranco Costanzo and Paola Monari. **Telehealth support for a global network of Italian hospitals.**

56 Donna Peters. **Reducing Hospitalizations Throught the Implementation of a Telehealth Programme.** Home Health Care Management Practice 2008 21:39.

57 Malcom Bridgen, Alana Minty, Susan Pilatzke, Lori Della Vedova, Laurie Sherrington, Karen McPahil. **Strenghts and weaknesses of teleoncology – The experience of Thunder Bay Regional Cancer Centre.** Oncology exchange Vol.7 No.1, February 2008.

58 P. Whitten, B. Love. **Patient and provider satisfaction with the use of telemedicine: Overview and rationale for cautious enthusiasm.** J Postgrad Med 2005 51:294-300.

59 J.A. Powell, M. Darvell, J.A.M. Gray. **The doctor, the patient and the world-wide web: how the internet is changing healthcare.** J R Soc Med 2003;96:74-76.

60 l.Rogozea, L. Cristea, M. Baritz, V. Burtea. **Telemedicine and ethical dilemmas.** Proceedings of the 8th WSEAS international conference on Artificial intelligence, knowledge engineering and data bases.

61 M.E. Morton. **Use and Acceptance of an Electronic Health Record: Factors Affecting Physician Attitudes.** PhD dissertation.

62 V. Chatrath, J. Pal Attrin, R. Chatrath. **Telemedicine and anaesthesia.** Indian J Anaesth. 2010 May- Jun; 54(3): 199-204.

63 R.G. Brooks, N. Menachemi. **Physicians' Use of Email With Patients: Factors Influencing Electronic Communication and Adherence to Best Practices.** J Med Internet Res. 2006 Jan-Mar; 8(1): e2.

64 P. Whitten, L. Buis, B. Love. **Physician-Patient e-Visit Programs: Implementation and Appropriateness.** Disease management and Health Outcomes: 2007, Vol. 15, Issue 4, pp.207-214.

65 Doarn CR, Yellowlees P, Jeffries DA, Lordan D, Davis S, Hammack G, McClosky-Armstrong T, Kvedar J. **Societal drivers in the applications of telehealth.** Telemedicine and e-Health, November 2008, 14(9): 998-1002.

66 Jarvis-Selinger S, Chan E, Payne R, Plohman K, Ho K. **Clinical telehealth across the disciplines: lessons learned.** Telemedicine and e-Health, September 2008, 14(7): 720-725.

67 Deborah Hanson, Judith Calhoun and Dean Smith. **Changes in Provider Attitudes Toward Telemedicine.** Telemedicine and e-Health, January 2009, 15(1): 39-43.

68 Car, J. and Sheikh, A. **Email consultations in health care: 2—acceptability and safe application.** BMJ 2004; 329:439-442.

69 Steven J Katz, Cheryl A Moyer, Douglas T Cox, and David T Stern. **Effect of a Triage-based E-mail System on Clinic Resource Use and Patient and Physician Satisfaction in Primary Care: A Randomized Controlled Trial.** J GEN INTERN MED 2003;18:736-744.

70 Bergmo TS, Kummervold PE, Gammon D, Dahl LB. **Electronic patient—provider communication: Will it offset office visits and telephone consultations in primary care?** International Journal of Medical Informatics (2005) 74, 705—710.

71 Julián Segura, Cecilia Roldán, Jordi Galera and Jordi Naval. **What Do Spanish Physicians Believe and Expect about Telemedicine? Results of a Delphi-Based Survey.** Telemedicine and e-Health. 2008 Jan-Feb;14(1):42-8.

72 Madhavi R Patt, Thomas K Houston, Mollie W Jenckes′ Daniel Z Sands′ Daniel E Ford. **Doctors Who Are Using E-mail With Their Patients: a Qualitative Exploration.** J Med Internet Res 2003; 5(2):e9.

73 Phoebe Lindsey Barton *et al*. **Specialist Physicians' Knowledge and Beliefs about Telemedicine: A Comparison of Users and Nonusers of the Technology.** Telemedicine and e-Health. October 2007, 13(5): 487-500.

74 K Bahaadini, K Yogesan, R Wootton. **Health staff priorities for the future development of telehealth in Western Australia.** Rural and Remote Health 9:1164, 2009.

75 Brian McKinstry, Philip Watson, Hilary Pinnock, David Heaney and Aziz Sheikh. **Telephone consulting in primary care: a triangulated qualitative study of patients and providers.** Br J Gen Pract 2009; DOIL 10.3399/bjgp09X420941.

76 Gurjit Kaur. **E-health: A New Perspective on Global Health.** Journal of Evolution and Technology - Vol. 15 Issue 1 -February 2006 - pgs 23-35.

77 Patricia R. Recupero. **E-mail and the Psychiatrist-Patient Relationship.** J Am Acad Psychiatry Law 33:465-75, 2005.

78 Paolo Zanaboni**,** Simonetta Scalvini**,** Palmira Bernocchi**,** Gabriella Borghi**,** Caterina Tridico and Cristina Masella. **Teleconsultation service to improve healthcare in rural areas: acceptance, organizational impact and appropriateness.** BMC Health Services Research 2009, 9:238.

79 Gagnon MP, Duplantie J, Fortin JP, Landry R. **Exploring the effects of telehealth on medical human resources supply: a qualitative case study in remote regions.** BMC Health Services Research 2009, 9**:**238.

80 Nicl Nijland, Julia van Gemert-Pijnen, Henk Boer, Michaël F Steehouder, Erwin R Seydel. **Evaluation of Internet-Based Technology for Supporting Self-Care: Problems Encountered by Patients and Caregivers When Using Self-Care Applications.** J Med Internet Res 2008;10(2):e13.

81 Göran Umefjord, Katarina Hamberg, Hans Malker and Göran Petersson. **The use of an Internet-based 'Ask the Doctor' Service involving family physicians: evaluation by a web survey.** Family Practice (April 2006) 23 (2): 159-166.

82 Adam William Darkins, Margaret Ann Cary. **Telemedicine and Telehealth: Principles, Policies, Performance and Piftalls.** Springer Publishing Company, 2000.

83 Sisira Edirippulige; Rohana Marasinghe; Siti Noorsuriani Maon; Yoshikazu Fujisawa. **The Impact of Telehealth on the Healthcare Workforce: A Global Perspective.** Human Resources in Healthcare, Health Informatics and Healthcare Systems (2010).

84 Jonathan Swinton, Davind Robinson and Richard Bischoff. **Telehealth and Rural Depression: Physician and Patient Perspectives.** Families, Systems and Health.

85 Raymond W. Pong & John Hogenbirk. **Reimbursing of Physicians for Telehealth Practice: Issues and Policy Options.** Medical Journal of the University of Alberta (2000).

86 Helen Richards, Gerry King, Margaret Reid, Ianin McNIcol, Eileen Brebner, David Godden. **Remote working: survey of attitudes to eHealth of doctors and nurses in rural general practices in the UK.** Family Practice 2005 Feb;22(1):2-7.

87 Nancy Halifax, Joseph Cafazzo, Melinda Hamill, Carlos A Rizo, Warren Mclsaac, Peter Rossos, Alexander Logan. **Telemanagement and hypertension: A qualitative assessment of patient and physician preferences.** Can J Cardiol. 2007 May 15; 23(7): 591–594.

88 Xiao Lou, Yoshie Sawada, Takako Takizawa. **Doctor-Patient Communication: A Comparison between Telemedicine Consultation and Face-to-Face Consultation.** Internal Medicine 2007;46(5):227-32.

89 Virginia Ilie, James Courtney, Craig Van Slyke. **Paper versus Electronic: Challenges Associated with Physicians' Usage of Electronic Medical Records (EMR).** System Sciences, 2007.

90 Albert Boonstra, Manda Broekhuis. **Barriers to the acceptance of electronic medical records by physicians from systematic review to taxonomy and interventions.** BMC Health Services Research 2010, 10**:**231

91 Silvina, Santana, Berthold Lausen, Catherine Chronaki, Per Kummervold, Tove Sorensen. **Online Communication Between Doctors and Patients in Europe: Status and Perspectives.** J Med Internet Res. 2010 Apr–Jun; 12(2): e20.

92 Ellington E, McGuinness TM. **Telepsychiatry for children and adolescents.** J Psychosoc Nurs Ment Health Serv. 2011 Feb;49(2):19-22.10.3928/02793695-20110111-03.

93 Inglis SC, Clark RA, McAlister FA, Ball J, Lewinter C, Cullington D, Steward S, Cleland JGF. **Structure telephone support or telemonitoring programmes for patients with chronic health failure.** Cochrane Database Syst Rev. 2010 Aug 4;(8):CD007228.

94 Payette C, Desrochers J, Lavoie-Tremblay M, Richer MC. **Exploring perceptions of healthcare professionals in the implementation of a new professional role of clinical telehealth coordinator within a University integrated network.** Telemed J E Health. 2010 Jun; 16(5):614-9.

95 Purc-Stephenson RJ, Thrasher C. **Nurses' experiences with telephone triage and advice: a meta-ethnography.** J Adv Nurs. 2010 Mar;66(3):482-94.

96 RCN (Royal College of Nursing). **Nurses are open to telehealth benefits.** Practice Nurse. 2010;

40(9): 09536612.

97 Lyndon H, Tyas D. **Telehealth enhances self-care and independence in people with long term conditions.** Nurs Times. 2010 Jul 6-12;106(26):12-3. PubMed PMID:20698409.

98 Love A, Hansen L. **Calling for care.** Qld Nurse. 2010 Jun;29(3):29.

99 Doherty L. **Video conferencing used to provide care and support for hard to reach communities.** Paediatr Nurs. 2010 Jun;22(5):6-7.

100 Pols J. **The heart of the matter: About Good Nursing and Telecare.** Health Care Anal. 2010 Dec;18(4):374-88.

101 Dixon RF. **Enhancing Primary Care Through Online Communications.** Health Aff (Millwood). 2010 Jul;29(7):1364-9.

102 MacKenzie E, Smith A, Angus N, Menzies S, Brulisauer F, Leslie SJ. **Mixed-method exploratory study of general practitioner and nurse perceptions of a new community based nurse-led heart failure service.** Rural Remote Health. 2010 Oct-Dec;10(4):1510.

103 Vuononvirta T, Timonen M, Keinänen-Kiukaanniemi S, Timonen O, Ylitalo K, Kanste O, Taanila A. **The attitudes of multiprofessional teams to telehealth adoption in northern Finland health centres.** Journal of Telemedicine and Telecare, 2009;15(6):290-6.

104 Ernesäter A, Holmström I, Engström M. **Telenurses' experiences of working with computerised decision support: supporting, inhibiting and quality improving.** Journal of Advanced Nursing, 2009 May;65(5):1074-83.

105 Demiris G, Doorenbos AZ, Towle C. **Ethical considerations regarding the use of technology for older adults. The case of telehealth.** Journal of Gerontological Nursing, 2009 Apr;2(2):128-36.

106 Fincher L, Ward C, Dawkins V, Magee V, Willson P. **Using telehealth to educate Parkinson's Disease patients about complicated medication regimes.** Journal of Gerontological Nursing, 2009 Feb;35(2):16-24.

107 Or CK, Valdez RS, Casper GR, Carayon P, Burke LJ, Brennan PF, Karsh BT. **Human factors and ergonomics in home care: current concerns and future considerations for health information technology.** Work. 2009;33(2):201-9.

108 Buck S. **Nine human factors contributing to the user acceptance of telemedicine applications: a cognitive-emotional approach.** Journal of Telemedicine and Telecare, 2009;15:55-58.

109 Kaminsky E, Rosenqvist U, Holmström I. **Telenurses' understanding of work: detective or educator?** Journal of Advanced Nursing. 2008;65(2):382-390.

110 Nilsson C, Skär L, Söderberg S. **Swedish District Nurses' Attitudes to implement Information and Communication Technology in Home Nursing.** The Open Nursing Journal, 2008;2:68-72.

111 Van den Berg N., Fiss T., Meinke C., Heymann R., Scriba S., Hoffmann W. **GP-support by means of AGnES-practice assistants and the use of telecare devices in a sparsely populated region in Northern Germany – proof of concept.** BMC Family Practice, 2009 Jun 19;10:44.

112 Botsis T, Hartvigsen G. **Current status and future perspectives in telecare for elderly people suffering from chronic diseases.** Journal of Telemedicine and Telecare, 2008;14:195-203.

113 Varkey P, Schumacher K, Swanton C, Timm B, Hagen PT. **Telemedicine in the work site: a study of feasibility and patient and provider satisfaction.** Journal of Telemedicine and Telecare, 2008;14:322-325.

114 Styles V. **Service users' acceptability of videoconferencing as a form of service delivery.** Journal Telemedicine and Telecare, 2008;14:415-420.

115 Sadler S. **Tomorrow's world.** Nurs Older People. 2008 Oct;20(8):19-20.

116 Eley R, Fallon T, Soar J, Buikstra E, Hegney D. **Nurses' confidence and experience in using information technology.** The Austalian Journal of Advanced Nursing, 2008 May;25(3):23-35.

117 Knight J. **Distance care is here to stay.** Nurs Older People. 2008 Oct;20(8):18-9.

118 Scott L. **Challenges and change in telehealth.** The Canadian Nurse, 2008 May;104(5):48.

119 Smith C. **Technology and Web-based support.** American Journal of Nursing, 2008 Sep; Vol 108 (9) Supp.

120 Weinert C, Cudney S, Hill WG. **Rural women, technology and self-management of chronic illness.** The Canadian Journal of Nursing Research, 2008 Sep;40(3):114-34.

121 Edirippulige S., Smith A.C., Beattie H., Davies E., Wootton R. **Pre-registration nurses: an investigation of knowledge, experience and comprehension of eHealth.** The Australian Journal of Advanced Nursing, Dec 2007- Feb 2008; 25(2): 78-83.

122 Dale J, Caramlau I, Docherty A, Sturt J, Hearnshaw H. **Telecare motivational interviewing for diabetes patient education and support: a randomised controlled trial based in primary care comparing nurse and peer supported delivery.** Trials, 2007 Jun 28;8:18.

123 Marineau M.L. **Telehealth Advance Practice Nursing: the lived experiences of individuals with acute infections transitioning in the home.** Nursing Forum, 2007 Oct-Dec;42(4):196-208.

124 Snooks HA, Willians AN, Griffiths LJ, Peconi J, Rance J, Snelgrove S, Sarangi S, Wainwright P, Cheung WY. **Real nursing? The development of telenursing.** Journal of Advanced Nursing 2007;61(6):631-640.

125 Harris A. **Summary of evidence for the effectiveness of telecare.** Report of Dorset County Council. November 2007.

126 Lamb GS, Shea K. **Nursing education in telehealth.** Journal of Telemedicine and Telecare, 2006;12:55-56.

127 Mair FS, Goldstein P, May C, Angus R, Shiels C, Hibbert D, O'Connor J, Boland A, Roberts C, Haycox A, Capewell S. **Patient and provider perspectives on home telecare: preliminary results from a randomised controlled trial.** Journal of Telemedicine and Telecare, 2005;11 Suppl 1:95-7.

128 Whitten P, Love B. **Patient and provider satisfaction with the use of telemedicine: overview and rationale for cautious enthusiasm.** Journal of Postgraduate Medicine, 2005 Oct-Dec;51(4):294-300.

129 Bryson M., Tidy N., Smith M., and Levy S. **An online survey of nurses' perceptions, knowledge and expectations of the National Health Service modernisation programme.** Journal of Telemedicine and Telecare, 2005;11 Suppl 1:64-6.

130 Edirippulige S. **Australian nurses' perceptions of eHealth.** Journal of Telemedicine and Telecare, 2005;11:266-268.

131 Valdez R., Patton T., and Brennan P. **To talk or not to talk: exploring culturally diverse patients' health information communication choices.** AMIA Annual Symposium Proceedings, 2010 Nov 13;2010:812-6

132 Bulik RJ. **Human factors in primary care telemedicine encounters.** Journal of Telemedicine and Telecare, 2008;14:169-172.

133 Wakefield BJ, Bylund CL, Homan JE, Ray A, Scherubel M, Kienzle MG, Rosenthal GE. **Nurse and patient communication profiles in a home-based telehealth intervention for health failure management.** Patient Education and Counselling. 2008;71:285-292.

134 Wakefield BJ, Holman JE, Ray A, Morse J, Kienzle MG. **Nurse and patient communication via low- and high- bandwidth home telecare systems.** Journal of Telemedicine and Telecare, 2004;10:156-159.

135 Garrelts J.C., Gagnon M., Eisenberg C., Moerer J., Carrithers J. **Impact of Telepharmacy in a Multihospital Health System.** American Journal of Health-System Pharmacy. 2010;67(17):1456-1462.

136 Wakefield D.S., Ward M.M., Loes J.L., O'Brien J., Sperry L. **Implementation of a Telepharmacy Service to Provide Round-the-clock Medication Order Review by Pharmacists.** American Journal of Health-System Pharmacy. 2010;67(23):2052-2057.

137 Keeys C.A., Dandurand K., Harris J., Gbadamosi L., Vincent J., Jackson-Tyger B., King J. **Providing Nighttime Pharmaceutical Services Through Telepharmacy.** American Journal of Health-System Pharmacy. 2002;59(8)

138 Keith A. Frey and Robert L. Bratton. **Role of Telemedicine in the Health Care Delivery System.** The Journal of the American Board of Family Medicine. 2002;15(2).

139 Boon A.D. **Telepharmacy at a Critical Access Hospital.** American Journal of Health-System Pharmacy. 2007;64(3):242-244.

140 Kimber M.B., Peterson G.M. **Telepharmacy – Enabling Technology to Provide Quality Pharmacy Services in Rural and Remote Areas.** Journal of Pharmacy Practice and Research 2006; 36: 128-33.

141 PausJenssen A.M., Spooner B.A., Wilson M.P., Wilson T.W. **Cardiovascular risk reduction via telehealth: A feasibility study.** Canadian Journal of Cardiology 2008;24(1):57-60.

142 Lam A.Y., Rose D. **Telepharmacy services in an urban community health clinic system.** Journal of the American Pharmacists Association(2003). 2009 Sep-Oct;49(5):652-9.

143 Jones C, Lacombe G. **Enhancing patient care via a pharmacist-managed rural anticoagulation clinic.** Healthcare Quarterly. 2009 Oct;13 Spec No:69-74.

144 Friesner D, Scott DM. **Exploring the Formation of Patient Satisfaction in Rural Community Telepharmacies.** Journal of the American Pharmacists Association 2009;49:509-518.

145 Chan D.S., Callahan C.W., Sheets S.J., Moreno C.N., Malone F.J. **An Internet-Based Store-and-Forward Video Home Telehealth System for Improving Asthma Outcomes in Children.** American Journal of Health-System Pharmacy. 2003;60(19).

146 Beney J., Devine E.B., Chow V., Ignoffo R.J., Mitsunaga L., Shahkarami M., McMillan A., Bero L.A. **Effect of Telephone Follow-up on the Physical Well-Being Dimension of Quality of Life in Patients With Cancer.** Pharmacotherapy. 2002;22(10).

147 Norris T.E., Hart G.L, Larson E,H., Tarczy-Hornoch P., Masuda D.L., Fuller S.S., House P.J., Dyck S.M. **Low-Bandwidth, Low-Cost Telemedicine Consultations in Rural Family Practice.** Journal of the American Board of Family Medicine 2002;15(2).

148 Lam A.Y., Rose D. **Effectiveness of Home Blood Pressure Monitoring, Web Communication, and Pharmacist Care on Hypertension Control: The e-BP Randomized Controlled Trial.** The Journal of the American Medical Association 2008 June. 25; 299(24): 2857–2867.

149 Sanz Arrufat A., Clemente Andújar M., Martínez Tormo J. **Hospital Pharmacy Departments on the internet. An unfinished business?** Farmacia Hospitalaria 2004 Jul-Aug;28(4):286-90.

150 Monane M., Matthias D.M., Nagle B.A., Kelly M.A. **Improving Prescribing Patterns for the Elderly Through an Online Drug Utilization Review Intervention.** The Journal of the American Medical Association, October 14, 1998—Vol 280, No. 14.

151 Casey M.M., Sorensen T.D., Elias W., Knudson A., Gregg W. **Current practices and state regulations regarding telepharmacy in rural hospitals.** American Journal of Health-System Pharmacy; Vol 67 Jul 1, 2010.

152 Huston D. Considering Telepharmacy Regulation in Canada. Canadian College of Health Service Executives, Paper Submission #1 for CHE Designation, November 1, 2009.

153 Barr P.J., McElnay J.C., Hughes C.M. **Connected health care: the future of health care and the role of the pharmacist.** Journal of Evaluation in Clinical Practice 2010, Aug 3.

154 Rose J.L. **Improved and expanded pharmacy care in rural Alaska through Telepharmacy and alternative methods demonstration project.** International Journal of Circumpolar Health 2007; 66(Suppl 1).

155 Finch TL, Mort M, Mair FS, May CR. **Future patients? Telehealthcare, roles and responsibilities.** Health and Social Care in the Community 2008 Jan;16(1):86-95.

156 Finch T. **Teledermatology for chronic disease management: coherence and normalization.** Chronic Illness 2008 Jun;4(2):127-34.

157 Gagnon MP, Duplantie J, Fortin JP, Lamothe L, Légaré F, Labrecque M. **Integrating scientific evidence to support telehomecare development in a remote region.** Telemedicine Journal and e-Health, 2009 Mar;15(2):195-8.

158 Bahaadini K, Yogesan K, Wootton R. **Health staff priorities for the future development of telehealth in Western Australia.** Rural Remote Health. 2009 Jul-Sep;9(3):1164.

159 Gagnon MP, Duplantie J, Fortin JP, Landry R. **Exploring the effects of telehealth on medical human resources supply: a qualitative case study in remote regions.** BioMed Central Health Service Research 2007, 7:6.

160 Al-Qirim N. **Championing telemedicine adoption and utilization in healthcare organizations in New Zealand.** International Journal of Medical Informatics, 2007 Jan;76(1):42-54.

161 Gagnon MP, Duplantie J, Fortin JP, Landry R. **Implementing telehealth to support medical practice in rural/remote regions: what are the conditions for success?** Implementation Science, 2006 Aug 24;1:18.

162 Dansky KH, Ajello J. **Marketing Telehealth to Align with Strategy.** Journal of Healthcare Managament, 2005 Jan-Feb;50(1):19-30.

163 Dansky KH, Vasey J, Bowles K. **Use of telehealth by older adults to manage heart failure.** Res Gerontol Nurs. 2008 Jan;1(1):25-32.

164 Jones, Josette F.; Brennan, Patricia F. **Telehealth Interventions to Improve Clinical Nursing of Elders.** Annual Review of Nursing Research, Volume 20, Number 1, 2002 , pp. 293-322(30).

165 Ryan J Spaulding, Kathy Davis and James Patterson. **A comparison of telehealth and face-to-face presentation for school professionals supporting students with chronic illness.** J Telemed Telecare 2008;14:211-214.

166 Edward Alan Miller. **The continuing need to investigate the nature and content of**

teleconsultation communication using interaction analysis techniques. J Telemed Telecare 2011;**17**:55-64.

167 Whitten P, Love B. Patient and Provider Satisfaction with the Use of Telemedicine: Overview and Rationale for Cautious Enthusiasm. J. Postgrad. Med. 2005;51(4):294-300

168 Altman DG, Schulz KF, Moher D, Egger M, Davidoff F, Elbourne DG, et al. The revised CONSORT statement for reporting randomized trials: explanation and elaboration. *Ann Intern Med* 2001;134:663-94.