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Evidence Based Guidelines for Nursing and Social Care on eHealth Services

Clinical Practice

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[List of the ENS4Care partners](#)

Executive Summary

The current document presents evidence-based guidelines to engage policy-makers, health and social care professionals, citizens and industry in the design and deployment of eHealth services at local, regional, national and European level based on identified practice examples collected through the ENS4Care thematic network from countries across the European Union (EU).

This guideline builds on the work of the ENS4Care network work stream 'Clinical practice' and is concerned with eHealth services to support clinical practice with an individual citizen, a family or a population in primary or secondary health and social care settings.

It focuses on the potential of Information and Communication Technologies (ICT) that nurses and social workers can use to contribute to the delivery of high quality clinical care to citizens in their daily practice. Examples are telehealth and telecare that support the treatment, care and follow up of citizens with COPD, diabetes, dementia, mental disorder, wounds etc. Another focus is to promote the use of ICT in organisational settings to efficiently exchange information between different professionals and citizens, and ensure that services are properly coordinated and responsive to changes in citizens' requirements. It is important to look at the necessary organisational changes and clarification as regards roles and responsibilities when implementing ICT (Checkland et al., 2008; Grant et al., 2009; Sorknaes, 2013).

The present document outlines key steps and considerations for the deployment of ICT at different levels to secure high-quality and safe clinical practice at the point of service delivery. It considers the deployment process, key factors that can act as barriers or facilitators, outcomes and implications, and relevant EU policy and legal context. It shares the combined knowledge of the ENS4Care partners from across the EU and invites all relevant stakeholders to consider this when deploying eHealth solutions for health and social care.

1. Introduction

There is a demand for new working methods to meet the current challenges faced by health and social care professionals. Policy-makers in Europe recognise that increased use of ICT in the health and social care sectors can help contain many of the challenges (Danish Regions, 2011; Kidholm et al., 2012, Oudshoorn, 2009). Within the last ten to twenty years, eHealth has increasingly been applied all over the world in the health and social care sectors, not only at hospitals, but also in domestic settings and by general practitioners.

The term, eHealth was first coined in the 1970s (World Health Organization, 2010). The following key elements are germane to the term eHealth: Its purpose is to monitor support requirements and provide health and social care support remotely with the aim of reducing waiting times and improving communication and (citizen) wellbeing and health outcomes. It involves the use of various types of telecommunication and information technologies (ICT). It is also intended to overcome geographical barriers, connecting users who are not in the same physical location. It can also improve access to health and social care services that often will not be consistently available in distant rural communities, and it is used to save lives in critical care and emergency situations (World Health Organization, 2010).

However, eHealth should not be viewed as a substitute for the face to face contact with professionals that citizens require at times of crisis or during acute phases of their illness, but it has the potential to radically enhance the exchange of information between service users and those concerned with their treatment and support and ensure that new or changing requirements are speedily addressed. Whilst nurses, social workers and other care staff across Europe already possess well-developed core skills and shared values, there is a wide variation in the organisation and management of services, as well as a range of statutory responsibilities ruling the practice of health and social workers.

The majority of eHealth services that focus on diagnosis and clinical management are routinely offered in developed regions. In low-income countries and in regions with limited infrastructure, eHealth applications are primarily used to link health and social care professionals with specialists, referral hospitals, and tertiary care centers (McLean et al., 2011a). Even though low-cost eHealth applications have been proven to be feasible and effective, clinically useful, sustainable and scalable in such settings and in underserved communities, the presence of a range of barriers means that these applications are not being adopted on a significant scale (Dario, Dunba, Felliciani, & et al., 2005; McLean et al., 2011a). The expansion and improvement of the quality of mobile telephony worldwide – even in the poorest and most remote parts of the world where access to health care is difficult, if not almost impossible – has provided new opportunities for the prevention, treatment and monitoring of diseases.

Recognising that there is no single agreed definition of eHealth, the World Health Organisation (WHO) has adopted this broad description (World Health Organization, 2010, p 9):

'The delivery of healthcare services, where distance is a critical factor, by healthcare professionals using information and communication technologies for the exchange of valid information and diagnosis, treatment and prevention of diseases and injuries, research and evaluation, and for the continuing education of health-care providers, all in the interest of advancing health and communities'

These technologies allow for communication between an individual citizen and health and social care professionals with convenience and confidentiality, as well as for the transmission of medical, imaging and health informatics data from one site to another. Many citizens recognise the value of ICT in health care and are willing to let information be shared electronically in order to ensure safety and improve continuity of care (Royal College of Nursing, 2014).

The present document sets out detailed guidelines aimed to **support the provision of eHealth in clinical practice**. The guidelines presented here are based on input from the ENS4Care network partners and submitted cases of practice examples. The results of that data collection process and its analysis are included in [the ENS4Care Deliverable](#) on Nursing and Social Care practices in ICT enabled Prevention, Clinical Practice, Advanced Roles, Integrated care and nurse ePrescribing, which was prepared by the ENS4Care partners in May 2015. The collected examples of eHealth services for clinical practice are numerous and they point towards a large number of different eHealth technologies in use, in a variety of care settings. The functions of remote monitoring and teleconsultations within the area of chronic diseases account for many of the examples. A particular focus is given to chronic disease remote monitoring and teleconsultation with discharged citizens affected by COPD. In addition, there is a fair amount of research to build on within this field that can be transferred to different local, regional and national health and social care settings across the EU.

In the following pages the scope of the guideline and its intended audience is clarified and key practice examples are given to illustrate the inherent potential. The main elements of implementation for a given eHealth service for clinical practice are detailed and clarified. These are intentionally presented at a generic level in order not to limit the scope of this document to any particular eHealth service or any particular country. It is expected that this document will be equally useful to health professionals and social workers, citizens, carers, industry and policy makers who might find themselves as the commissioners, implementers or recipients of eHealth services in clinical practice.

2. The guideline

2.1 Scope

This guideline represents an evidence-based consensus statement that aims to guide decisions and implementation of appropriate eHealth services to support clinical practice with citizens and families challenged by illness or disability in primary or secondary health and community care settings. The guideline bases itself on identified practice examples collected through the ENS4Care thematic network from countries across the European Union (EU).

This guideline targets and will be of particular relevance to nurses and social workers concerned with the deployment of eHealth services for the provision of clinical practice. However it also contains important perspectives that can empower decision makers, other health professionals and social care staff, and citizens in securing an active role in setting the direction of care, ethical as well as gender perspectives.

The guideline offers an evidence-based process to the deployment of eHealth services from planning to evaluation and elaboration. It identifies the key steps to be taken, and main issues to be considered. Importantly, it highlights the main factors that are likely to boost or block the process.

While based on examples from different countries across the EU, the guideline was developed following an analysis that distilled the key success features of such practices without limiting itself to particular policy or practice contexts. It is therefore designed and intended to be useful for professionals and citizens across EU countries.

2.2 Process & Outcome

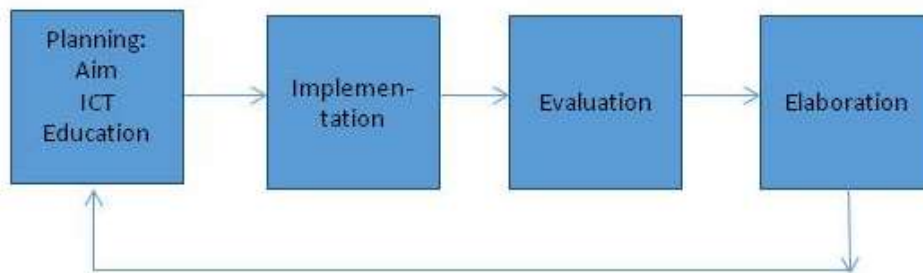


Figure 1. Guideline Deployment Pathway

2.2.1 Process

Stage One: Planning

The success of the eHealth service will rest on the amount and quality of the preparation and planning prior to the implementation phase. Therefore the planning together with the implementation stage is likely to be the lengthiest and most intensive stage of the deployment pathway.

Six questions to ask before starting

1. What is the aim and rationale of the service?
2. What are the local needs – were patients and carers consulted?
3. Does the local community have access to the technology needed to support the services?
4. Which services are currently available and could they be enhanced?
5. Are there safety, ethical and gender aspects to be considered?
6. What are the costs involved?

At all stages it is important to secure the managers' support and involvement. A series of decisions will need consideration, beginning with establishing **the aim**, determining **who** the service is for, identifying **why** it is needed in clinical practice, **how** its success will be **measured**, and what **the costs** will be (Kidholm et al., 2012; Royal College of Nursing, 2012a). There is **key personnel** who must be consulted or collaborated with and furthermore, the service must be supported by existing **governance requirements**.

Guidelines statement: All eHealth services must be supported by robust governance arrangements.

Planning also involves decisions on how an **ICT component** will benefit practice and citizens. This can range from simple smart phone applications to complicated remote monitoring equipment (Kidholm et al., 2012; Royal College of Nursing, 2014) and real time video-consultation (Kidholm et al., 2012; Royal College of Nursing, 2012a).

Guideline statement: Planning for all eHealth services must include statements on how an ICT component will benefit practice and citizens.

The **organisational resources** in terms of sufficient equipment and well trained specialist staff as required by a particular eHealth service need to be in place, as would an appreciation of the fact that the new eHealth service can be temporarily disruptive to staff work processes.

Guideline statement: During implementation of eHealth services consideration needs to be given to the disruption that it may cause to staff.

Finally, safety, ethical and gender aspects must be taken in consideration (Kidholm et al., 2012; Royal College of Nursing, 2012a).

- **Aim and eHealth context**

eHealth services - such as telephone consultation, text messaging, web-based support and remote monitoring of vital signs – can facilitate citizens, families and communities to improve their health and well-being. eHealth helps to improve self-management, preventing deterioration of health, and decreasing the need for surgery consultations and hospital admissions (Royal College of Nursing,

2012a). Introducing telehealth to clinical practice is usually not a question of replacing existing services, but instead using technology to enhance, improve access and triage, and offer a wider range of choice of the services provided for patient care (Royal College of Nursing, 2012b).

Addition to conventional treatment

In addition to conventional treatment, citizens receive daily real-time video consultations (teleconsultation) initiated within 24 hours after discharge. Reference: Case TVC (ANNEX 1)

eHealth is used in prevention, treatment, care, rehabilitation and as part of palliative care. eHealth applications can be classified into different types:

- Health and social care professional to health and social care professional
- Health and social care professional to citizen
- Store-and-forward or asynchronous eHealth, which involves the exchange of pre-recorded data between two or more individuals at different times
- Real-time or synchronous eHealth, which requires the individuals involved to be simultaneously present for immediate exchange of information, as in the case of video-conferencing.

Target population

Teleconsultations are conducted between skilled hospital-based specialised respiratory nurses and discharged citizens with severe COPD via the tele-equipment. Reference: Case TVC (ANNEX 1)

- **ICT component**

In both real-time and asynchronous eHealth, relevant information may be transmitted through a variety of media, such as text, audio, video, or still images (McLean et al., 2011b). In a citizen self-monitored service, citizens can maintain records, e.g. in the form of symptom scores and vital measuring and then send the data to hospitals, GP's, primary care centres or call centres. Biometric measuring devices, such as equipment monitoring heart rate, blood pressure, blood glucose levels, oxygen saturation, and weight are increasingly used for remote monitoring and management of citizens with acute and chronic illnesses in a home-based setting. The citizen is contacted if measurements fall outside the specified values, and the citizen might also receive individual feedback from a digital voice.

Guideline statements:

- **In a citizen self-monitored service, citizens should maintain their own records, e.g. in the form of symptom scores and vital measuring and assume responsibility for sending the data to hospitals, GPs, primary care centres or call centres**
- **Biometric measuring devices, such as equipment monitoring heart rate, blood pressure, blood glucose levels, oxygen saturation, and weight should be considered for remote monitoring and management of citizens with acute and chronic illnesses in their home-based setting.**

Examples of Remote Monitoring and Tele-equipment

Monitoring of chronic patients with controlled diseases who do not need repeated observation by health services just to monitor their vital parameters. The technology is used for registering the vital parameters and sending the information to the nurse who is responsible for the citizen. The technology required includes internet connection, telephone, mobile/smart phone, tablet, electronic database and telemonitoring system (the last three are mainly used by nurses).

Reference: Case MR (ANNEX 1)

The tele-equipment contains video equipment, an on-off switch, a volume button and an alarm switch and is connected to measuring equipment in the form of a combined spirometer and a pulse oximetry (Spirotel). The telenurses' equipment consists of a computer with a built-in web camera and microphone, extra screen for readings of patient measurements and a computer linked to the EPR. Teleconsultations can take place via internet connection (ADSL), wireless network or satellite. Measurements made by the citizens are transferred from the citizens' homes to the telenurses via a closed and separate IT-system. Reference: Case TVC (ANNEX 1)

- **Safety and ethical aspects to be considered when implementing the guideline**

The secure transfer, access and storage of health and social care data is essential. It must be a key concern when designing services (Royal College of Nursing, 2012b). Ethical principles and standards should guide the governance and risk management structures of the services (Royal College of Nursing, 2012b).

Guideline statement: The secure transfer, access and storage of health and social care data is essential.

While the ethical aspects of remote assessment and treatment have yet to be fully explored, citizens should be able to expect equivalent standards of care - and the same ethical principles - whether care is provided in person or by use of ICT.

Guideline statement: Ethical principles and standards should guide the governance and risk management structures of the services.

Safety

Tele-equipment is not an integrated part of the patient's EPR due to safety issues of patient data.

Reference: Case TVC (ANNEX 1)

Stage Two: Implementation

The examples submitted through the ENS4Care survey indicated that a number of issues require attention during the implementation stage, most significantly **citizen and professional involvement**. In particular, the success of an eHealth solution appeared to hinge on securing the engagement of citizens, nurses and social workers. The importance of introduction, **supervision** and follow-up sessions through the implementation stage was reported in the submitted practice examples as necessary to secure staff engagement and maintain motivation (3). Equally important is the involvement of citizens and their families. Information about a particular eHealth solution requires wide dissemination to the public and in particular the affected primary care context. The submissions indicated that input into the design of their health and social care service contributes to the **empowerment** of citizens (Royal College of Nursing, 2012b).

Core competencies for health specialists

- Clinical decision-making skills
- Identifying indications that require medical referral
- Communication skills - listening and questioning skills
- Interview skills to acquire relevant clinical and general information
- Providing advice, including the use of non-visual communication skills
- Limitations of telephone and other remote consultations
- Considerations of patient recall
- Education and training for patients and carers

eHealth literacy for patients and citizens

- Ability to work with information – reading, writing, understanding and remembering
- Knowing about one's own health
- Physical access to digital services that work
- Digital services that suit individual needs
- Feel motivated to engage with IT
- Know how to engage in information and systems
- Feel confident in the control of data and the system

(Nørgaard and Kayser, 2015)

The submitted practices also suggested that the implementation stage could be fraught with challenges and requires strong **leadership** presence. Health professionals with an in-depth knowledge of the practice context are most qualified to lead the implementation stage. They need to be able to appreciate staff difficulties and to advise on realistic and practical solutions. The management must possess excellent interpersonal communication skills and be both patient-centred and understanding (Royal College of Nursing, 2012b). Finally, throughout the implementation stage there should be continuous support for staff (Checkland et al., 2008; Grant et al., 2009; Sorknaes, 2013). This can be done through clear and accessible documentation available to all staff, such as instruction manuals, guidelines and protocols (Royal College of Nursing, 2012b).

Guideline statements:

- **A strong leadership presence is essential through the implementation stage of all eHealth services.**
- **Consideration needs to be given to the development of clear and accessible staff documentation such as instruction manuals, guidelines and protocols.**

Important focus

Clinical buy-in and enthusiasm, patient involvement, an ambitious implementation plan, good leadership and management, reliable, compatible and cost effective technology, simple and easy-to-use equipment with intelligent software to flag early warning signs, and technical support are essential to ensure that the initiative is sustainable (Royal College of Nursing, 2012b).

- **Education and training**

Education and training involves the citizen, carer health professional and social worker, developing a generic understanding of the rationale for the use of the technology, preparing citizens and/or carers to use the equipment, as well as development of knowledge and understanding of equipment (Royal College of Nursing, 2012a).

Guideline statement: eHealth education and training should involve the citizen, carer health professional and social worker.

Education

The patients and their families are educated by a nurse in the functioning of the modem that will allow the remote monitoring. Reference: Case MR 2 (ANNEX 1)

Stage Three: Evaluation

Many of the submitted practices underlined the importance of the evaluation stage and strongly advised to pay attention to sufficient planning and allocation of staff resources. Collaboration and teamwork among everyone involved and openness in communication are key features for a successful evaluation process. Submitted practices emphasised that evaluation should involve all relevant stakeholders and include health professionals, social workers and managers from primary and secondary health and social care, as well as citizens (Checkland et al., 2008; Grant et al., 2009; Oudshoorn, 2009; Sorknaes, 2013). As long as clear data collection procedures were chosen during the initial planning stage, the evaluation process should identify changes in key indicators that would reveal areas where the eHealth service has positive or negative impact. Attention should also be paid to issues of privacy and safety. Privacy and safety are crucial to the long-term success of any eHealth service that hosts citizen and provider data.

Guideline statements:

- Evaluation processes should identify changes in key indicators that would reveal areas where the eHealth service has positive or negative impact.
- Maintaining citizen privacy and safety are crucial to the long-term success of any eHealth service that hosts citizen and provider data.

Stage Four: Elaboration

The final stage in the guideline deployment pathway should be further elaboration and refinement of the eHealth service and the implementation process. Submitted practices indicated that **user friendliness** is key; the design of the eHealth solution should continuously strive to build on and improve this aspect.

Guideline statement: eHealth solutions should be user friendly.

As nurses, social workers and the organisation adopt and implement the eHealth more widely, attention needs to be paid to ensuring that this facilitates, and does not hinder, health professionals' and social workers' work and care plans. The submitted practice examples indicated that improvement of the eHealth service based on evaluation and feedback leads to improved staff acceptance (Oudshoorn, 2009; Sorknaes, 2013).

Equally important to user friendliness is the issue of interoperability. Feedback from the submitted practices indicates that eHealth services well integrated with existing IT systems are more easily accepted and used by staff; in contrast, difficulties with interoperability often make health professionals and social workers abandon the eHealth service in favour of their previous ways of working. During the elaboration stage, it should thus be ensured, that the eHealth service is an integral and facilitating element in the health professional and social worker's work.

Guideline statement: eHealth services should be well integrated with existing IT systems so they can be easily accepted and used by staff.

2.2.3 Outcomes

Identification and selection of appropriate eHealth services should follow the procedure adopted by the ENS4Care network and provided in detail in deliverable D1.8 Evaluation Framework. Specifically, a chosen eHealth service should fulfil the following criteria:

1. ICT component: the example or practice shall include the use of ICT technologies supporting the delivery of health and social care.

2. Nurses and/or social workers: The good practice needs to be introduced or implemented primarily with nurses' and/or social workers' involvement.
3. Cost-effectiveness: The example or practice should demonstrate that the services enabled by ICT tools have the potential of providing cost-effectiveness to the health and social care system.
4. Patient empowerment: The example or practice should demonstrate that the services enabled by ICT tools have improved or have the potential to improve and empower citizens.
5. Usability and usefulness of the ICT tool/service: The example or practice should demonstrate that the ICT tool is considered easy to use and useful by both professionals and citizens.
6. Person centeredness, safety and privacy: The example or practice should respect citizen centeredness, address issues related to safety, and respect privacy and associated ethical aspects.

The submitted practices for WP3 indicated that potential outcomes of eHealth services in clinical practice include increased **quality of care** and **satisfaction, efficiency, reduction in re-admissions** and unnecessary hospital visits, and more **effective discharge** processes. Furthermore, attention should also be paid to outcomes indicating changes in relations between providers and departments/sectors. The submissions indicated positive behavioural changes in terms of **improved interaction** between primary and secondary care teams and more **information sharing**, more encouragement for **multi-professional working** and improved **communication**. Changes in professional areas of responsibility have also been reported and these can be discomfoting (Checkland et al., 2008; Grant et al., 2009; Sorknaes, 2013). However, greater multi-professional working and clarity around responsibilities was can be a particularly positive outcome of the implementation of eHealth services in clinical practice.

- **Cost-effectiveness**

An increasing volume of research shows cost savings by using eHealth services, but there is no conclusive evidence that eHealth is cost-effective compared to conventional care (Chaudry et al., 2006; Dinesen et al., 2012; Fasterholdt I, 2011; Finkelstein Sm, 2006; Haesum et al., 2012; Johnston B, 2000; F. S. Mair, Haycox, May, & Williams, 2000; Mistry, 2012; Pare G, 2006; Peeters, Mistiaen, & Francke, 2011; Wade, Karnon, Elshaug, & Hiller, 2010). As reported in several studies and reviews, emergency department visits, hospital admission rates and a worsening in the condition seem to be reduced with no side-effects (Gaikwad & Warren, 2009; Haesum et al., 2012; Mistry, 2012; Peeters et al., 2011; Wade et al., 2010). The cost-effectiveness depends on the service being evaluated, the perspective, the sample size, the type of economic analyses, on how the costs and outcome were measured, and also on the uptake rate and usage of the service (Gaikwad & Warren, 2009; Haesum et al., 2012; Mistry, 2012; Peeters et al., 2011; Wade et al., 2010). Several studies have shown that eHealth reduces travel time for both citizens and professionals. It reduces waiting times and hospital admissions, citizens receive a quicker diagnosis, and the citizen experience of eHealth services is extremely positive in a number of settings (Darkins, 2008)

Cost & behavioural implications

- Cost-benefit analysis
- Equipment
- Set up costs
- Education costs (staff and citizens)
- Call costs

- **Nurses and social workers**

A number of organisational aspects need to be considered when implementing eHealth services (Dinesen, Hejlesen, & Toft, 2011; McLean et al., 2011b). It has been shown that implementation of eHealth services does not only affect the involved health and social care professionals (Checkland et al., 2008; Grant et al., 2009; Sorknaes, 2013), but the **entire organisation** (Lamothe, Fortin, Labbe, Gagnon, & Messikh, 2006). For example, It has been shown that implementation of eHealth can result in new units and different structures for internal communication, deployment of new staff living far away from the working place, a different and more positive attitude towards technology, changed patient flow through the department and better care and treatment (Lamothe et al., 2006). Implementation of eHealth services also requires a change of working routines and organisation. It is necessary to secure the required time for planning and education of the new service, and appropriate resources must be available. It may also lead to task shifting (Aas, 2001). In addition, it has been demonstrated that eHealth can release specialist resources. The specialists avoid expensive transportation and waiting time, and the scheduled consultations/contacts bring about higher flexibility and constitute an advantage for the citizens (Wootton, Bahaadinbeigy, & Hailey, 2011).

Lack of physical presence

The lack of physical presence does not seem to present a fundamental obstacle for obtaining a narrative and moral proximity between patients and nurses. Patients and telenurses experience that it is possible to create a close relationship and proximity in technology-mediated care.

Telenurses must be able to verbalise their guidance in a clear manner and patients must be able to translate words into action. This means that teleconsultations cannot be used for all patients. The nurses take on the role as managers of care by verbalising guidance and instructions and involving patients actively in observation, monitoring and treatment of their disease. Teleconsultations constitute new roles and a new relationship between patient and nurse (Checkland et al., 2008; Grant et al., 2009; Sorknaes, 2013). Technology-mediated nursing was experienced as qualified care where it was possible to create a close relationship between the two partners involved.

Reference: Case TVC (ANNEX 1)

- Usability and usefulness of the ICT tool/service

Checklist (Royal College of Nursing, 2014)

- Has the software been designed with clinical practice in mind?
- Have nursing staff been involved in the development of the system?
- Have health professionals received the right training to use this new system?
- Is there evidence that the system works?
- Are there enough machines and devices available for the team and others?
- Do they understand the risks associated with using the technology?
- What processes are in place for addressing concerns about the system or the way it is used?

Several studies failed due to technological problems, not only as a result of unreliability of the technology but also owing to difficulties in working with an older, pre-technological population struggling to use the systems (McLean et al., 2011a). For instance, a study was stopped early due to multiple technical challenges with the equipment (Nguyen et al., 2008).

Users must be able to use the equipment

Patients and nurses alike must be confident and able to use the telemedicine equipment (Checkland et al., 2008; Grant et al., 2009; Sorknaes, 2013). The equipment must function well - otherwise it will shift the focus away from the patient/teleconsultations and affect the patient/nurse relationship negatively.

It can be questioned if it is ethically acceptable to use technology in the treatment and care of elderly patients, given the fact that more than half of the older people aged 65-89 years have never used the internet and almost half of them never use a computer. The specialists therefore considered it essential that the equipment is easy to use for frail and severely ill COPD patients.

Reference: Case TVC (ANNEX 1)

- Safety and privacy

Secure transfer, access and storage of health data is essential. This must be a key concern when redesigning services (Royal College of Nursing, 2012b). Ethical principles and standards should guide the governance and risk structures of the services (Royal College of Nursing, 2012b). Any eHealth service plan must comply with professional governance procedures, legal principles and existing policies. These could include relevant and up-to-date clinical, operational and technical policies, procedures, guidelines and standards - covering (among other things) security, confidentiality, data storage, informed consent, legal liability, and what might constitute poor or unacceptable practice.

Health and social care professionals involved in eHealth programmes should be aware of local policies (including those that determine appropriate video and telephone behaviour), relevant legislation (including equipment safety), professional guidance (such as standards for recordkeeping) and any technical standards that might apply.

Safety, effectiveness and satisfaction

Teleconsultations have been proven to be a safe, effective and satisfactory way to deliver long distance treatment and care for frail and severely ill COPD patients.

98% of the patients stated that they could easily or with little difficulty take the measurements accurately, and 83% stated that they used the equipment without help from anyone. This may, of course, be due to the supervision by the technician who delivered and installed the system in their home and also, the fact that the telenurses were able to properly guide the patients during the teleconsultations. Reference: Case TVC (ANNEX 1)

- **Citizen empowerment**

A review based on 27 articles concluded, that tele-monitoring and eHealth seems to empower citizens in their self-management and positively impact on citizens' medication adherence. It furthermore seems to improve their self-efficacy, health outcomes, and physical status and moreover, helps them to improve their functional status and quality of life (Gaikwad & Warren, 2009; Garcia-Aymerich et al., 2007). In another review, it was concluded that eHealth may have a positive impact on the quality of life (McLean et al., 2011b). There seems to be an overall satisfaction with eHealth services as reported in several studies and reviews (Finkelstein et al., 2004; F. Mair & Whitten, 2000; McLean et al., 2011b; Polisen et al., 2010).

The European project Better Breathing conducted a randomised clinical trial (RCT) of home tele-monitoring with 99 participants. The trial showed a significant and clinically important improvement in the quality of life as measured by St. George's Respiratory Questionnaire, Hospital Anxiety and Depression and the EuroQOL (EQ-5D). Improvements were seen immediately, but did not last over time (Lewis et al., 2010).

Empowerment

Patients are empowered, and they experience fewer face-to-face consultations compared to patients in traditional treatment regimens. Furthermore, they are able to control their indicators because they are responsible for monitoring their vital parameters. The initiative reduces the probability of complications related to chronic health conditions due to its function as a predictive trigger, and it decreases the use of health services. Reference: Case MR 1 (ANNEX 1)

The patients take on an active role in the observation and measurement of their condition, and their self-image changes accordingly as they become active self-managing patients. Reference: Case TVC (ANNEX 1)

3. Policy context

Policy-makers in Europe hope that increased use of Information and Communication Technology (ICT) in the health and social care sector can help solve many of the challenges in this area (Kidholm et al., 2012). It is being said that tele-healthcare technologies are emerging as a result of a discourse that emphasizes cost-effectiveness and active involvement of citizens in order to create a more effective policy for meeting the growing demand of care and the expected scarcity of health and social care professionals which occur due to demographic changes (Oudshoorn, 2009).

The European Commission has expressed strong support for eHealth as a solution to challenges faced by the health and social care sectors (Kidholm et al., 2012). In fact, the Commission has supported European projects – with millions of Euros – to find solutions to these challenges (Kidholm et al., 2012).

Local eHealth policies, regulations and strategies will need to be taken into consideration, and the present guideline will need to fit within any restrictions. Examples exist in different EU Member States that have developed an **eHealth strategy**: E.g. the UK Department of Health Information Strategy (www.dh.gov.uk), the Danish National eHealth Strategy (www.ssi.dk supported by government investment of 10.7 million Euros in the testing of large-scale eHealth solutions), and EFN Members' Report on eHealth (EFN, 2011).

The submissions examined in the development of the present guideline indicated making use of local hospital policies and National Health Service policies, and following relevant directives on data protection. Countries interested in updating, revising or developing relevant eHealth policies can refer to the **European Commission's eHealth Portal** (ec.europa.eu/health/ehealth) and WHO's National eHealth Strategy Toolkit (www.who.int/ehealth).

Using eHealth is part of any other aspect of nursing and social work practice. This includes:

- being competent in managing the equipment involved and delivering the care associated with its use
- clarity on who has ongoing responsibility for the care of users
- ensuring informed consent prior to use of any eHealth application
- determining and informing people of their rights and responsibilities
- respecting privacy – e.g. knowing who is in the room at a remote site and whether they have the right to view any data or images being transmitted, or verifying the identity of all people involved
- maintaining confidentiality, also after the consultation
- ensuring data integrity and network security
- agreeing on ownership of eHealth records

4. Requirements to implement the guideline

Certain requirements will need to be addressed and taken into consideration for implementation of the guideline. From an EU perspective, a legal framework for eHealth can be drawn from a series of related directives and most significantly the **Data Protection Directive 95/46/EC** on the processing of personal data and on the free movement of such data. Appreciation and adherence to the Data

Protection Directive would be a crucial consideration and requirement prior to implementation of the guideline. In addition, where the eHealth service goes beyond sharing and coordination of information for integrated care and is concerned with implementation of innovative monitoring equipment or other implantable devices, conforming to the **Medical Device Directive 2007/47/EC** also becomes a requirement. Both directives are currently under revision and any changes to them also need to be taken into account.

5. Review of the guideline

This guideline has been developed at a specific point in time and within a particular EU policy context. Any major policy changes is likely to have an impact on this guideline, and as such it may benefit from a periodic review and update. In particular, with the completion of the EU's Horizon 2020 Programme, a reflection on the contribution and adoption of this particular guideline would be of benefit and could lead to a revision.

6. Conclusion

Requirements for establishing a successful eHealth service:

- Managers' support
- Clinical buy-in and enthusiasm
- Educated specialist staff
- Citizens' involvement and eHealth literacy
- An ambitious implementation plan
- Good leadership and management
- Reliable, compatible and cost effective technology
- Simple and easy-to-use equipment with intelligent software to flag early warning signs
- Technical support is essential to ensure sustainability of the initiative.

Implementation of eHealth services for clinical practice holds great potential for improving the quality and safety of care for citizens across the EU through ensuring continuity of health care across primary and secondary community sectors. This may yield substantial benefits for citizens and health professionals. The present document intends to guide decisions about the identification and implementation of appropriate eHealth services to support the provision of clinical practice. Analysis of good national and regional practice examples of how nurses and social workers have used eHealth solutions to improve the health and social care services for citizens led to the identification of the most appropriate examples, the essential elements of which were translated into the present guidelines.

This document should be used by health professionals and social workers responsible for the procurement of eHealth services in clinical practice. It can also be used by the managers to inform them of the task of implementing a given eHealth service in a local context, of the decisions to be taken, and of which processes need to be followed. The decision to adopt new technologies and telesystems should involve all relevant care personnel and managers to ensure effective buy-in and roll-out of the approach. The key to a successful project is to make use of already existing resources

and to keep the design simple. Strategies and processes to support the development and commitment from staff are vital to the success, as well as regular review and dissemination of findings to support evidence-based practice.

The use of eHealth means that health and social care professionals will have to learn new skills and ways of working (Sorknaes, 2013). All such staff are well placed to ensure that citizens are able to question the use of computers in their care and the way information about them is kept or shared. Systems and the way they are used must be acceptable (Royal College of Nursing, 2014). Well-designed systems should improve the delivery of patient focused, evidence-based care and treatment (Royal College of Nursing, 2014). Evidence from pilot tests and live use will indicate whether an IT system such as a cardiac monitor or electronic prescribing system is fit for the purpose for which it was designed (Royal College of Nursing, 2014).

But the system must also fit practice – in other words, it has to suit the way people work and the environments in which care is delivered. For example, there must be an adequate number of computers in a ward. There must be robust and reliable access to systems for people in the community, and the technology they use must be portable (Royal College of Nursing, 2014). The people need to understand the eHealth technology and be confident and able to support citizens and carers in its use. As well as working within their recognized professional codes of conduct complementary to the traditional ethics of health and social care professionals, eHealth services can help meet the key aims for supporting citizens with long term services such as prevention and staying healthy; self-management; assisted management; supported management and palliative care.

Europe's changing demographics, combined with the continuous need to offer value for money, imply that technology is set to play a critical role in delivering quality and affordable care and advice. And while technology is changing rapidly, improved access means there will be new and innovative ways for citizens to benefit from it (Royal College of Nursing, 2012a). By including regular reviews and evaluation, and assessing citizen attitudes as well as outcomes, this guideline can help to ensure that eHealth services are flexible enough to meet changing budgets as well as the evolving community health and social care needs (Royal College of Nursing, 2012a).

7. Glossary

Community-based care - spectrum of services that enable individuals to live in the community and, in the case of children, to grow up in a family environment as opposed to an institution. It encompasses mainstream services, such as housing, health care, education, employment, culture and leisure, which should be accessible to everyone regardless of the nature of their impairment or the required level of support. It also refers to specialised services, such as personal assistance for persons with disabilities, respite care and others. In addition, the term includes family-based and family-like care for children, including substitute family care and preventive measures for early intervention and family support.

COPD – Chronic Obstructive Pulmonary Disease

EC – European Commission

EPR – Electronic Patient Record

EU – European Union

eHealth - Refers to Information and Communication Technology tools and services for health, used by healthcare professionals, institutions and administrations as well as utilities which provide patients directly with services related to healthcare. (epSOS)

ICN – International Council of Nurses


ICT - ICT (information and communications technology) is an umbrella term that includes any communication device or application. For example radio; television; mobile phones; computer and network hardware and software; and services such as videoconferencing and distance learning.

Team – A group of individuals who work together to produce products or deliver services for which they are mutually accountable. Team members share goals and are mutually held accountable for meeting them, they are interdependent in their accomplishment, and they affect the results through their interactions with one another. Because the team is held collectively accountable, the work of integrating with one another is included among the responsibilities of each member (Mohrman et al, 1995).

Telehealth - Telehealth refers to the provision of care from a distance using a range of electronic technologies. Examples of telehealth include video consultations to support diagnosis and management, clinical networks and health professional education (11). Telehealth programmes are often established by health care organisations, such as the NHS or general practice.

Telecare - Telecare is the provision of technology to enable a patient or client to live more safely and with greater independence in their home. For example, pendant alarms or smoke and heat sensors, and alarms to summon help in an emergency. Telecare programmes, on the other hand, are often led by social care organisations such as local authorities.

Telehealthcare - Telehealthcare is the convergence of telecare and telehealth to provide a technology-enabled and integrated approach to the delivery of effective, high-quality health and care services. It can be used to describe a range of long-distance care options available by telephone, mobile, broadband and video conferencing (11).



Types of information - Information management includes electronic and physical information that is delivered through multiple channels that may include mobile phones and the internet. For example data; paper documents; electronic documents; audio; and video.

WHO – World Health Organisation

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Appendices

Examples of eHealth services:

Case TVC: Teleconsultation to COPD patients at home

Title of the telemedicine intervention/project	The effects of daily real-time telemedicine video consultations between hospital-based nurses and discharged patients with severe COPD (Denmark)
Health problem and characteristics of the application	Hospitalization with acute exacerbation of chronic obstructive pulmonary disease (AECOPD) causes a major burden for the COPD patients and is a common cause for admissions and readmissions to medical wards.
Participants. Describe the participants: How many, who is involved (patient, families, nurses, other health professionals)	Patients (266) admitted with AECOPD (having severe COPD) at two different locations were recruited at hospital discharge and randomly assigned (1:1) to either daily teleconsultation with nurses specialized in respiratory diseases (8 nurses) for one week in addition to conventional treatment, the teleconsultation (TVC) group or to conventional treatment, the CT group. If needed, the nurse could contact a doctor specialized in respiratory diseases.
The intervention. What is the intervention, duration of the intervention, what is the nurses role	Daily real-time telemedicine video consultations (teleconsultation) for one week between hospital-based nurses specialized in respiratory diseases (telenurses) and patients with severe COPD discharged after AECOPD in addition to conventional treatment compared to the effect of conventional treatment.
Technology. Describe the technology being used, who is installing it,	The telemedicine equipment consisted of a briefcase with built-in computer including a web camera, microphone and measurement equipment. Measurement equipment consisted of spirometry, pulse and oxygen saturation equipment.
Outcome. What outcome was measured – qualitative and/or quantitative	We did qualitative (field work) research and quantitative research (intervention study and RCT). The research showed positive effect of teleconsultation on user satisfaction, user experience, and effects on readmission and mortality.
Safety issues. Has there been any safety problem to be solved, what safety aspects need to be considered according to users and technical equipment	There have been no safety problems, but it is important to pay attention to the fact that the technology should be easy to use for elderly frail patients with severe COPD and no experience with computers. It is also important that the technology is a high functionality solution.

<p>Organisational and Socio-cultural, ethical and legal aspects. How does the intervention affect the organisation, the social- culture, is there any ethical and legal aspects to consider</p>	<p>It is important that managers support the telemedicine intervention.</p> <p>Technological mediation of nursing practices changes the way nurses perform and their professional role.</p> <p>It also changes the patient role by inducing them to take a more active part in their own disease and treatment.</p> <p>It is important to establish a close cooperation between the medical specialist and the telenurse specialists.</p> <p>Teleconsultations are comparable to a visit at the out-patient clinic.</p>
<p>Clinical effectiveness - experience/results. Describe the user satisfaction, problems discovered, the effect of the intervention/ results e.g. economic, (re)admission, changed working area, culture change,</p>	<p>Study findings show that patients and nurses alike consider technology-mediated nursing consultations as qualified care, enabling a close relationship between patient and nurse.</p> <p>Technological mediation of nursing practices change the way nurses perform and it also changes their professional role. The nurses compensate for a lack of physical presence with the patient by amplifying their audio-visual perceptions, communicative skills and by including the patient as their assistant. Correspondingly, their patients take on an active role in observation and measurement of their condition, and their self-image changes accordingly as they become active self-managing patients.</p> <p>A total of 266 patients (mean age 71.5 years, SD 9.5 years) were allocated to either TVC (n=132) or CT (n=134). In conclusion, addition of one week of teleconsultations between hospital-based telenurses and patients with severe COPD discharged after hospitalization with AECOPD was as safe and effective as conventional treatment. There was a tendency to reduced readmission, but the intervention did not significantly reduce readmissions or affect mortality.</p>
<p>Documentation. Has the project been published (please link to the publication)</p>	<p>The effect of real-time teleconsultations between hospital-based nurses and patients with severe COPD discharged after exacerbation</p> <p><i>J Telemed Telecare</i> 2013 19: 466 originally published online 13 November 2013</p>

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<p>Perspective. Has the intervention been implemented as a running service, how do you see the future for the intervention, what potential do you see for the intervention</p>	<p>The telemedicine intervention is now a running service.</p> <p>The use of telemedicine intervention has increased to include other telemedicine interventions as e.g. telemedicine rehabilitation.</p>

Case MR 1: Remote monitoring of patients with controlled chronic diseases at home

Title of the telemedicine intervention/project	Distance monitorization
Health problem and characteristics of the application	Monitor chronic patients that have controlled diseases and don't need to be repeatedly observed in health services only to monitor their vital parameters.
Participants. Describe the participants: How many, who is involved(patient, families nurses, other health professionals)	The participants involved are patients and nurses.
The intervention. What is the intervention, duration of the intervention, what is the nurses role	The practice consists on the implementation of a system of telemonitoring varied vital parameters such as blood pressure, blood glucose, percutaneous oxygen saturation, heart rate, cholesterolemia, the coagulation and falls. The user does these parameters measurement at home and the devices ship information via telecommunications network for a portable device that is always with the nurse responsible for that patient. Where a significant change of basal values is registered, the nurse activates the patient's social network of support or goes himself to the place. The technology is now going under tests and the study population will be of a medium-sized rural city. The project is being post forward by private initiative and without public subsidies.
Technology. Describe the technology being used, who is installing it,	The technology is used for registering the measurements of the vital parameters and then sending this information to the nurse who is responsible for that patient. The technology required is internet connection, telephone, mobile/smart phone, tablet, electronic database and telemonitoring system (the last three are mainly used by nurses).
Outcome. What outcome was measured – qualitative and/or quantitative	With this initiative the patient is allowed to remain in his environment and be safely monitored by nurses. The outcomes are both qualitative and quantitative. The patient gets the opportunity of staying at home, among its family and integrated in his community. The quantitative outcomes can be seen financially, because the patient doesn't have to travel frequently to meet the health professional to measure his

	vital parameters and health system is not overloaded with the dispensable utilization of health services.
Safety issues. Has there been any safety problem to be solved, what safety aspects need to be considered according to users and technical equipment	No.
Organisational and Socio-cultural, ethical and legal aspects. How does the intervention affects the organisation, the social- culture, is there any ethical and legal aspects to consider	This kind of interventions empower the patients. They are allowed to stay at home and keep doing their daily activities/routines. The patients are empowered in two different ways: they don't have to go to consultation as often as they should if they weren't telemonitored and they can control their indicators because they are responsible for monitoring their vital parameters.
Clinical effectiveness - experience/results. Describe the user satisfaction, problems discovered, the effect of the intervention/ results e.g. economic, (re)admission, changed working area, culture change,	This initiative reduces the probability of complications related to chronic health conditions as it works as a predictive trigger and it decreases the use of health services.
Documentation. Has the project been published (please link to the publication)	Not yet.
Perspective. Has the intervention been implemented as a running service, how do you see the future for the intervention, what potential do you see for the intervention	It is still in the testing phase. We expect to have the project running as a service to patients, in the market, by the end of 2014. We believe that any nurse in his/her public/private practice can use the system.

Case MR 2: Remote monitoring via Implantable Cardioverter Defibrillator (ICD) implantation

Title of the telemedicine intervention/project	Quality of Life with Remote Monitoring
Health problem and characteristics of the application	The effects of the Remote Monitoring (MR) on Patient Outcome not yet been investigated. This is a pilot study that aims to describe the effects of the RM on the levels of Quality of Life (QoL) of Patients with an ICD.
Participants. Describe the participants: How many, who is involved (patient, families nurses, other health professionals)	30 patients who underwent ICD implantation. The patients and their families are educated by a Nurse about the functioning of the modem that will allow the MR.
The intervention. What is the intervention, duration of the intervention, what is the nurses role	Remote monitoring allows a continuous monitoring of the heart condition and functioning of the ICD of the patients at home. This study also records the possible positive effects on the psychological state (depression, anxiety) and QoL of patients who underwent ICD implantation. The nurse plays a key role: educator of patients and monitoring of the clinical and psychological status of them.
Technology. Describe the technology being used, who is installing it,	An USB modem.
Outcome. What outcome was measured – qualitative and/or quantitative	Arrhythmias, QoL, Depression, Anxiety.
Safety issues. Has there been any safety problem to be solved, what safety aspects need to be considered according to users and technical equipment	Patients sign a consent to the study and treatment of personal data.
Organisational and Socio-cultural, ethical and legal aspects. How does the intervention affects the organisation, the social- culture, is there any ethical and legal aspects to consider	The study had the consent of the Ethics Committee before starting

<p>Clinical effectiveness - experience/results. Describe the user satisfaction, problems discovered, the effect of the intervention/ results e.g. economic, (re)admission, changed working area, culture change,</p>	<p>The Literature have already recognized the financial benefits of Remote Monitoring such as the reduction of scheduled in-clinic visit and then the Remote follow-up may avoid unscheduled visits following an ICD shock (Santini et al., 2009; Masella et al., 2008).</p> <p>In this way we have a project to identify the Nursing Outcomes (Patient Outcomes) that we realize using the Remote Monitoring of the Patients with Cardiac Device.</p>
<p>Documentation. Has the project been published (please link to the publication)</p>	<p>When the study will end, it will be submitted for publication.</p>
<p>Perspective. Has the intervention been implemented as a running service, how do you see the future for the intervention, what potential do you see for the intervention</p>	<p>The Remote Monitoring (RM) led various benefits: early detection of complications and arrhythmia events, increase of patient's satisfaction for the healthcare services.</p> <p>We believe that the RM could have a powerful potential for other outcomes of patients such as an increase of QoL levels.</p> <p>The definition of Nursing Outcomes related to the RM is of relevant importance for understanding the effects of such Practice. Meanwhile the Organizations would be stimulated to development of Nurse-Monitoring Unit in the hospitals or Nurse-Based Clinic at the territory.</p>

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