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### Telemedicine and Dermatology in the elderly in France: inventory of experiments

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#### ABSTRACT

Telemedicine is now in vogue, allowing thanks to the computer and communication tools to be deployed in the field of health, such as Dermatology, areas in which it has shown interest. As the population is aging, Geriatrics is more and more concerned by this innovative practice and nursing homes are more and more concerned. We take a look at telemedicine projects in France deployed in the field of dermatology in the elderly.

**Keywords:** Telemedicine ; dermatology ; geriatrics ; nursing home

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## INTRODUCTION

The European Union, and notably France, is experiencing population ageing. This development will jeopardize the future balance of public finance, including that of health care. Life expectancy at birth continues to rise worldwide, and in Europe, it is approaching or exceeding 85 years for women and 80 years for men [1]. The quality of life in these extra years, experienced after age 80 or 85, is of increasing concern to authorities seeking to delay the onset of chronic diseases, senescence, functional decline, frailty and loss of autonomy. The growing number of elderly people in the French population causes increased usage of the healthcare system. In 1997, people aged 60 and over represented almost one-third of the total medical expenditure and almost half of drug expenditure, while making up only 20% of the total population. People aged 65 and over have an average outlay of €3,000 per year, which is higher than that of the general population average of €1,800 per year [2]. These figures highlight the impact of the increasing number of elderly people in our country.

The development of information and communication technologies (ICTs) for the elderly is a promising venture. They create new opportunities to assist and care for elderly people at home or in specialized institutions, including nursing homes and hospitals. Grouped under the term *gerontotechnology*, the first analyses of their contributions to this field appeared in the mid-1990s. Gerontotechnology examines technology and aging in order to improve living conditions and working environments, as well as medical care for dependent seniors [3].

## METHOD

We undertake a systematic review of related literature by searching electronic bibliographic databases in PubMed and Google Scholar and identifying studies published. The search was restricted to studies published in the era of

French telemedicine projects or studies in dermatology exclusively.

## REVIEW OF THE LITERATURE

In Aquitaine, an experiment on teleconsultation was conducted from September 2012 - September 2013 involving six nursing homes. 19 patients were included with an average age of 82.4. 51 teleconsultations were performed, looking at aftercare for bedsores (57.9%), trophic vascular ulcers (26.3%) and trauma wounds (15.8%). Telemedicine significantly improved the wound healing process and reduced expenditure on bandages by reducing the rate of dressing changes ( $p < 0.005$ ). The stakes of telemedicine are high in geriatrics, especially in regard to aftercare for elderly people with chronic conditions requiring repeated trips and admissions to the hospital. This work showed an excellent level of aftercare with the rate of recommendations close to 100%. The information and assistance available during teleconsultations provided notable theoretical and practical training to carers in nursing homes. On the economic side, this study showed that remote consultations were able to eliminate the need for in-person consultations or hospitalization for 79% of the patients included (4). The information and assistance that were provided during these remote sessions made it possible to deliver genuine theoretical and practical training to caregivers in these nursing homes. From an economic perspective, this study demonstrated that remote sessions made it possible to avoid medical consultations or hospitalization for 79% of the patients who were included in the study.

In 2009, at the CHU Besançon Dermatology Department's outpatient treatment center for chronic wounds, 240 patients received 820 bandages from outpatient services. Most of these cases involved frail, elderly patients with limited mobility. The Dermatology Department decided to set up a telemedicine service to provide remote follow-up care and diagnostics for the wounds. The objectives were to improve patient aftercare by limiting the number of

consultations at CHRU Besançon's treatment center, reduce the cost of care, and offer local hospitals, private practices, and nursing homes a structured support network. In 2003, a study by the American Telemedicine Association (ATA) had already reported 62 experiments in 37 different U.S. states using telemedicine for dermatology. There are two methods of support defined by the ATA:

- *store-and-forward teledermatology* involves an expert consultant communicating remotely with the patient's dermatologist and using digital images and clinical information to make a diagnosis.

- *live interactive teledermatology* is a teleconsultation between the patient and health professionals using videoconferencing equipment (5-6).

This method of care is currently widespread, as shown by the Télégéria network. Télégéria is one of only a few teleconsultation experiments in dermatology and has completed approximately 100 consultations since the project's launch in 2004 (7).

An experimentation through tele-expertise for treating chronic wounds in elderly subjects residing in nursing home was conducted in the Haute-Vienne region. The goal is to avoid moving elderly patients often with reduced mobility as well as the costs generated by ambulance transportation. Of the 40 nursing homes in Haute-Vienne invited to share, 22 committed to it, but only the first 10 responses were accepted. Between April 15, 2010 and April 15, 2012, digital photographs of 34 patients selected by 10 nursing homes were sent to the messaging service specifically made for the Limoges University Hospital. The average number of teletransmissions by these nursing homes was 3.4 in 2 years. These 34 cases accounted for 26 chronic wounds in 24 patients. There were 10 pressure sores, 2 perforating foot ulcers, and 14 leg ulcers. Twenty roundtrip ambulatory commutes were avoided. Tele-expertise has allowed for 20 patients to receive better care for chronic wounds without moving

the patients to a hospital (8). Other experiments in telemedicine in the field of chronic wounds exist in France such as CICAT in Languedoc Rousillon (now Occitanie) and TELAP in Normandy. Thus, the service of telemedicine Domoplaies has allowed a rate of healing of complex wounds and/or chronic conditions at half the cost if compared to typical treatment according to a medico-economic analysis by the CICAT-Occitanie network (9).

Other experiments in telemedicine in the field of chronic wounds exist within the borders of mainland France, such as CICAT in Occitanie, and TELAP in Normandie. As such, the Domoplaies telemedical service has resulted in a comparable rate of scar formation in complex and/or chronic wounds while halving the cost compared to traditional treatments, according to a medical economic analysis undertaken by the CICAT-Occitanie Network. Consequently, since October 2013, experts in CICAT-Occitanie have delivered some 14,000 remote sessions for 4,500 patients (9) in the Occitanie region. The cumulative results over a decade show that 75% of wounds were improved or cured, while the number of hospitalizations fell by 72% and the usage of ambulances to transport patients for admission to a specialist chronic wound center was reduced by 56%. Of the 14,000 remote sessions delivered as part of the Domoplaies Project, the majority were performed at home (54%) and in a mobile context using secure consultations on tablets or smartphones, while sessions in nursing homes accounted for 32% of sessions. These remote delivery sessions related to bedsores, leg ulcers, diabetic wounds of the feet, and cancerous wounds.

Since 2013, the Rouen University Hospital has thus been developing its telemedicine activities by way of remote consultations and remote delivery of expertise in the field of dermatology for around twenty nursing homes and a number of other healthcare facilities in the Seine-Maritime and Eure *départements*. The University Hospital's dermatology department makes use of telemedicine to consult with patients remotely,

to view photos of lesions, or to support a healthcare professional in the delivery of a treatment such as the application of a dressing. As such, in 2016, 376 sessions were completed: 303 remote consultations and 73 sessions involving remote delivery of expertise, with 86% of sessions relating to senior care facilities. Aside from the improvement in the standard of treatment provided, particularly by reducing the waiting times for consultations to be provided, these sessions also made it possible to save the expense incurred by transportation in a sitting or lying position, as well reducing the number of visits to emergency wards by elderly patients. The resulting sessions were eligible for the ETAPES (Experimental Telemedicine And Provision of Enhanced Services) Program and for the associated billing processes. (10-11)

In 2017, the ARS Normandy Regional Health Agency launched a tender for projects to enhance and further develop its telemedicine offering for the benefit of residents of senior care facilities. In this context, the CHU de Rouen University Hospital and its GHT (regional grouping of hospitals) for the "Rouen and Seine Heartland" region submitted a proposal to enhance their dermatological activities and to expand to cover other specialisms including geriatrics, ENT, anesthetics, and palliative care.

Among the first telemedicine experiments in France involving nursing homes is Télégéria (12). Télégéria is a system offering teleconsultations, video consultations with experts, and teleassistance for the elderly in geriatric hospitals and nursing homes. A telemedicine network founded in 2004, Télégéria gives patients (who are living in nursing homes or hospitalized at the geriatric hospital Vaugirard Gabriel-Pallez) the benefit of expert advice through teleconsultations with Georges Pompidou European Hospital (HEGP, AP-HP). The network is based on the observation of polyopathy among the elderly, which requires advice from multidisciplinary specialists. The medical objective is to evaluate the interest and potential of using telemedicine

for clinical sessions in more than 20 areas of expertise, including orthopedics, dermatology, care of pressure ulcers, vascular medicine, palliative care, pneumology, neurology, and urology, as well as sessions between hospital geriatricians and coordinating physicians from nursing homes.

A 15-month activity report was able to identify 700 telemedicine sessions that involved the following areas in the following distributions: orthopedics (35%), cardiology and cardiac and vascular ultrasounds (32%), dermatology (17%), neurology (4%), and geriatrics (2%).

Sterenn, which is a platform for telemedical services in Brittany that became operational in March 2015, enables remote consultations to be performed and expertise and assistance to be delivered remotely. Since March 2016, Sterenn has progressively expanded to incorporate ten expert centers, 24 client sites and 12 independent healthcare professionals acting as clients, in a total of six clinical fields: psychiatry, geriatrics, and a broad spectrum of medical issues including vascular surgery, diabetic feet, dermatology and wounds and bedsores. 407 sessions have been delivered since March 2015. (13) For example:

- **TLM Chronic Wounds:** Remote consultation and assistance for patients suffering from chronic wounding with a nurse specialist with expertise in wounds and scarring, an occupational therapist, or a doctor. Led by the Saint-Hélier (Rennes) Hub, this program involves six senior care centers and two organizations providing care to home-based patients.

- **Téléplaies T7:** Remote expertise in chronic wounds and scarring. This project is led by the CHT d'Armor (*Centre Hospitalier de Paimpol* Hospital) in conjunction with the region's independent healthcare professionals. (13)

Standardized geriatric assessment can also be performed by telemedicine in nursing homes. This is shown by a retrospective study carried out in Bordeaux, with remote consultations

provided in 39 nursing homes located in the *départements* of Gironde and Dordogne. Three hundred and four residents benefited from telemedicine services, dealing with complex solutions including psychiatric and behavioral issues associated with Alzheimer's-disease or related conditions, chronic wounds, psychiatric illness and palliative situations. Variables that were recorded included the average age of residents, ADL, MMSE, CIRS-G, the number and types of medications taken per day during scheduled hospitalization. In this context, 500 remote consultations were performed, primarily for psychiatric and behavioral issues (28.4%) and complex chronic wounds (27.8%) (14).

The remote consultation project for nursing homes in Lorraine was initiated by the ARS Lorraine Regional Health Agency in conjunction with the Nancy University Hospital and Télésanté Lorraine, a telemedicine company. This formed part of the "Elderly People at Risk of Loss of Independence" or PAERPA experiment. The first remote consultations in nursing homes in Lorraine took place on June 24<sup>th</sup>, 2014. Two nursing homes were included in the experiment (Residence Le Parc and Residence Saint-Joseph), with three other institutions joining the experiment at a later stage for a total of five. Five categories of medical request were targeted, with cardiovascular and pulmonary conditions, geriatric psychiatry, dermatology, iatrogenic conditions and palliative care. A total of sixty remote consultations were performed for 41 residents with an average age of 87.2 years. Limitations encountered were related to time and technology (availability, technical problems due to network issues, poor speed, and lack of Wi-Fi coverage) (15).

## CONCLUSION

The avenues for telemedicine applications are gradually opening up to geriatrics, and projects should increase in the years to come. There are multiple forces driving this, but the preservation of quality of life for seniors at home and in retirement homes is an especial priority. Currently, thanks to the E-CARE platform, our

team is developing a system for telemonitoring geriatric risk among nursing home residents with the aim of reducing preventable hospitalizations in emergency departments, and preventing decompensation of patients with geriatric risk factors.

**Conflict of interest:** none

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