# Observing the Work Practices of an Inter-professional Home Care Team

## Supporting a Dynamic Approach for Quality Home Care Delivery

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**Abstract** We are reporting an observational study conducted as part of a larger French research project called PiCADO[i]. The study explores collaborative activities in work practices of inter-professional teams aiming to deliver quality home care. The findings show the use of a variety of dynamic coordination mechanisms depending on patients' conditions. We suggest that future system design process consider the flexibility and the dynamicity of team-based care to support quality home care.

**Keywords**
Home care; Team collaboration; Teamwork; observational study.

## 1 Introduction

This paper is about new collaborative practices currently implemented to accommodate the evolution of the care system in France. Healthcare professionals are adopting new practices to handle cost-containment policies and the need to take care of increasing numbers of patients and elderly people staying at home. In the health private sector, no standardization of these new collaborative practices is suggested, and no computer-based system exists to support them. However, we can observe some local initiatives that are quoted as good examples, and some reflections at a national level to reform the care sector.

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So we are at a turning point where it is important to understand the effective collaborative practices that are taking place in the local initiatives. This is vital if we are to be able to design more appropriate devices and services.

Therefore we have observed one inter-professional team which has adopted an integrated home care approach in the primary sector; this team is considered one of the few successful examples in France, as it manages to keep patients with complicated conditions at home and delivers high quality care. They consider patient' quality of life as a main objective. This self-created inter-professional team has collectively defined some coordinative mechanisms, but does not use any computer-based support.

This paper studies the new collaborative inter-professional practices taking place in this observed team and the coordination activities exhibited in these work practices. The aim is to provide useful insights to aid the design of future coordination technologies to support these emerging work practices.

In the following sections we begin by explaining the context within the French health system that allows for the further understanding of what makes changes in practice necessary. We then review the related work about focus shifting in healthcare studies and describe the setting and methodology in which we carried out our observations and report on our major findings. Finally, we discuss the implications for the design of technology supporting dynamic care teamwork in home care settings.

In this paper we refer to the teams adopting this approach of integrated home care as "inter-professional home care teams" or "home care teams" for short.

## 2 Context

### *2.1 Towards a more integrated care system*

As in many developed countries, France has a growing number of elderly people with chronic conditions. This demographic shift goes with growing healthcare needs which challenge the re-organization of long-term care (Robine and Michel 2004).

Until now, the French health system has performed very well in satisfying the expectations of the population, providing high-quality services, with freedom of choice and generally no waiting lists for treatment (Rodwin 2003). However, the health system faces socioeconomic disparities and geographic inequalities in the density of healthcare professionals. Furthermore, the rising expenditure and consequent deficits in statutory health insurance, together with a slowing of economic growth, and unemployment rising is of prime concern (Chevreul et al. 2010).

The French health system is amongst the most expensive in Europe. Cost-containment policies aiming at limiting supply and restricting coverage have been hindered by public discontent and ardent opposition by the medical professions which traditionally enjoy very liberal conditions of independent medical practice (Imai, Jacobzone, and Lenain 2000).

Facing these challenges, the French healthcare system is moving from a linkage-based model to a more integrated care system (Somme and de Stampa 2011), a movement impaired by the current separation between health and social services; between institutional (hospital and long-term care) and community-based care services; between private, non-profit and public services; and between the various payment systems (public, insurances, fee-for-services) (Henrard 2002).

This aimed integrated approach of delivering care requires the French health workers to change their current autonomous practices and move toward a more collaborative approach.

### *2.2 The rising of home care delivery*

Most of the patients now prefer to avoid hospitalization since a medical management and quality care can be offered to them at home with an equivalent level of safety.

Moreover, an increasing proportion of patients request to exercise more responsibility in making decisions about the care required for the conditions they suffer. This societal change is supported by the medical demonstration that the patient's active participation in the management of their illness seems to be a positive factor for their quality of life and, in some cases, survival. In addition, with an aging population, chronic diseases and disabilities are growing, if not dominant, in the health system. The development of ambulatory care is essential to provide appropriate medical and technological solutions that meet the economic requirements(Lévi and Saguez 2008).

Indeed, ambulatory medicine favors a patient-centered approach instead of a disease-centered one. Thus, the implementation of ambulatory medicine requires adequate coordination of functions to ensure the realization of the patient care with quality comparable to those in hospital.

According to a report of the French Academy of Technologies in 2008, the emergence of these structures as an alternative to hospitalization, intended to answer the following: First, patients' demand of a medical care that minimizes rupture of family social or professional ties; second, a shortage of hospital beds and the objective to reduce hospital overload; finally, the need for savings in the care consumption (Lévi and Saguez 2008). This report introduced the "Domomédecine" concept that describes a health system that keeps the patient at home while allowing it to benefit from a set of medical and care acts comparable in number, and in quality, to those that could be done at the hospital. These medical and care acts can be complex, In that they exploit the most modern technologies available. Therefore, the best part of certain acts can be at home or during the socio-professional activities of the patient and the hospital becomes a contributor in this health system (Lévi and Saguez 2008).

This study is part of a large French research project called PiCADO, which aims at designing, developing, testing, and evaluating the first operational system of "Domomédecine".

## 3 Related work

Healthcare delivery is often an inherently collaborative effort. Due to the increasing specialization of modern medicine (Strauss 1997), providing care for a single patient requires the involvement of many different professionals (Tang and Carpendale 2007).

This collaborative nature has motivated many studies exploring different aspects of collaborative behaviors in healthcare delivery practices. These include 1) temporal coordination, as we can see in (Reddy and Dourish 2002) study discussing the role of temporal patterns in providing individuals with the means to coordinate information and work, 2) mobility and spatiality reflected by the well-defined spatial specialization of healthcare services (Bardram and Bossen 2005), which indicates the inherently distributed nature of healthcare work especially in a hospital setting, as noted by (Bossen 2002), and 3) formality of artifacts, as in Chen's work on the transitional artifact used to complete the gap between the formal documentation and the clinical work flow in an Emergency Department (Chen 2010).

Another stream of studies focused on home care delivery, following the move of the developed world towards technology-enabled care in home and self-care. These studies explored different coordination and design challenges imposed by this move.

In these studies, many give special attention to the new role the patients and their family caregivers play especially in managing chronic diseases. For example, (Mamykina et al. 2008) proposed an application empowering the patients to control their condition through the interaction with diabetes educators. (Bardram, Bossen, and Thomsen 2005), explored the transformation in the patient-physician relationship based on the introduction of home-care monitoring equipment. (Andersen et al. 2011) explored telemonitoring practices and proposed a new socio-technical design approach, which transforms the role of patient in order to alleviate the problems of data interpretation, which are inherent in telemonitoring practices.

Other researchers explored home as a place for providing healthcare, and challenges and opportunities related to moving from healthcare settings to the patient's home. (Palen and Aaløkke 2006, 79) studied how the capacity of the patient to manage their medication can give healthcare workers indication on the patient status. (Piras and Zanutto 2010) described how patients keep their health information and use Personal Health Records at home. (Balaam et al. 2011) addressed problems that arise from sharing home with other family members; in their study, the use of TV as an interface for the rehabilitation at home raises for instance the issue of who could use the TV in the lounge room.

Recent studies related to home care are extending their focus and go beyond monitoring and data-transfer to include the support of a more holistic approach of collaboration between different actors in order to provide quality home care. This is expressed by (Christensen and Grönvall 2011) in their work that highlights the

cooperative nature of home care work, and emphasizes on substantial articulation work needed among the actors, such as family members and care workers engaged in providing care.

Nevertheless, there has been little work done related to the specific issue of coordination between private health workers, professional caregivers and informal caregivers. This paper reports findings from a field study that addresses coordination activities among members of an inter-professional home care team.

In contrast to work done by (Petrakou 2007) where they studied coordination of actors across organizations in the domain of elderly home care, the case examined teams members that do not belong to any organization and thereby do not follow any predefined coordination protocol. In addition, the main objective of these teams is to enhance patient quality of life, and this affect the care delivery as they look at the patient as an actor of his own care plan.

The aim of this paper is to explore the work practices of home care teams and identify the used coordination mechanisms. In addition we propose some design implications suggested by the particularity of such collective work.

## 4 The case study

The "E-maison médicale" association is a group of different private health workers and professional caregivers, mainly located in several cities of the Troyes agglomeration (N-E of France). They aim at improving the quality of home care by creating inter-professional care teams.

We chose to situate our fieldwork in the city of Troyes because this city is facing the twin challenge of resource deficit and an increasing demand for care. Troyes is located in the Champagne-Ardenne region (one of the five regions in France) which has a growing aging population and suffers from an exodus of doctors (Magniez et al. 2008). In addition, this team-based initiative is one of the few successful examples of collaboration among different private health professionals for home care in France, where solo-based practices are more common between health workers (Chevreul et al. 2010).

### *4.1 History and Motivation*

The association started in 2011, after a physician and a nurse being faced with the situation of one patient who wanted to spend his last moments at home. Despite his challenging situation, his family was determined to honor his choice.

The patient was terminally ill, he had been suffering from Alzheimer's disease, which is a progressive disease and can cause death. In addition, his status was aggravated by some pulmonary problems. This case required heavy medications and associated care.

To overcome the situation, the general practitioner and the nurse who were taking care of this patient had to question their way of providing care because they could not leave the patient and his family coping with this situation alone.

In order to deal with the situation, the doctor and nurse contacted and invited about ten of their private (freelance) colleagues working in the same geographic

area, in order to discuss how they could set together a care plan. The solution that was so defined was to put in place a team of freelance care professionals, who could deliver different treatments and care. This team helped the patient spend his last days at home, and comforted the main familial caregiver (his wife).

This success story was the spark that motivated the creation of an association to facilitate the establishment of relationships among local care professionals (freelance or employed), and to help set care plans that put together their different skills to fulfill the wishes of the patients and their families.

In 2012, the "E-maison médicale" association had about fifty members from different medical professions: professional caregivers, physiotherapists, biologists, physicians, pharmacists, nurses, and representatives of patients.

### *4.2 Status*

This kind of pluridisciplinary team does not have any official status in the healthcare system, and they do not have any official shared responsibility of the patient. Each of the team members has a private work status, and has jumped into this team care approach as an opportunity to share experiences and to provide a better quality of care to their patients.

However, without any regulation to accompany this collaborative approach, working as a team is regarded as doing extra work for coordinating and communicating without having an appropriate reward. This is why few health workers have adopted this collaborative approach.

### *4.3 Functioning*

The objective of this association is to enable the creation of links between health professionals in the local area. They are aiming at creating a multidisciplinary health team for each patient, organized as a network of professionals in order to allow the patient to receive care at home rather than being hospitalized (as long as they can benefit from a quality of care at least equal to the one delivered in the hospital).

Once enrolled through their doctor (or any other care professional who is a member of the association), patients and their families are recognized as part of a team that, depending on each patient's needs, may include nurses, dieticians, pharmacists, specialist physicians, mental health services and home care. All together, the members of the team participate in creating a "care plan" for each patient. This care plan, which captures the patient's personal goals, becomes a guide for all team members. The goal is to help the patient stay on top of their conditions, and to provide care that is continual, coordinated, and comprehensive.

If a patient or a family caregiver wishes to benefit from the system, but none of the health professionals around them are members of the association e-maison médicale, they can start benefitting from it if one of these professionals joins the association e-maison médicale.

The strategy of the association is to help all the patients to keep the same health partners and to motivate these partners to work as a team. They are aiming at

creating a new way of working collaboratively, inspired by the way the hospital staff is working, but adapted to private workers in a city. In fact, each healthcare professional is very sensitive to their autonomy and individuality. The goal of the association is not then to standardize the work practices, but to combine different skills in order to improve the quality of home care delivery.

### *4.4 Illustration*

Nicolas is suffering from Alzheimer's disease, which changed the lifestyle of his wife Jeannette. She did her best to adapt herself and to live with the disease, but the status of Nicolas is getting worse and the situation among them is becoming difficult to manage. On top of that, Nicolas is suffering from pulmonary problems that make it more difficult to keep him safe at home.

Jeanette is tired, so she started to search for help, but things became more complicated, as she realized that the solutions, which contacted organizations suggest are not necessarily compatible with her promise to not leave her husband alone, despite her exhaustion. Jeannette is not able anymore to provide all the necessary treatment and day care, a fact that raises the anxiety of the couple to be separated.

Jeannette's family doctor and the nurse who comes every week are part of the e-maison médicale association and they offered to set a network of care professionals to help in day care, and for the administration of the different treatments. Depending on the needs, the care professionals come several times a week or a day, the physician comes when this is necessary, the physiotherapist comes at home, and a homecare assistant comes when Jeannette needs to go out.

Jeannette is now able to count on the care professionals 24/7. In addition, as Nicolas now needs an oxygen tank, and other respiratory devices in case of emergency, the pharmacy delivered the necessary medical devices and medications.

To keep everybody informed about the status of the patient, the care professionals are using a "liaison notebook". This notebook is left at home and all care professionals as well as Jeannette put down their observations. The team is working with limited resources, but is succeeding in keeping Nicolas safe at home, and Jeannette did not need to spend her time calling for appointments.

## 5 Method and setting

In order to investigate the collaborative practices of the home care teams we described above, we adopted multi-faceted ethnographic methods to gain meaningful insights of the nature and complexities of home care work practices:

- General observations of the activities performed by the members of the home care teams, and their use of artifacts;
- Interviews with team members.

We shadowed one team member (a registered nurse) in his tour during a period of three days (15 hours total), and we observed his work in the homes of 12 different patients. The observer jotted down notes related to the provided care, the artifacts used, the information exchanged with other team members. During and after each visit, informal interviews were conducted with the different teams members.

In addition, in order to understand how health professionals manage the mix between their works on solo based-deal with this collective approach of care delivery, we interviewed three physicians who participate in team-based home care in the city of Troyes. Semi-structured interviews were conducted to understand the implication of this innovative approach on their daily practices.

The interview protocol focused on: (a) how do they participate in providing home care to their patients? (b) What sort of information do they share with other health professionals? (c) What sort of coordination tools do they use? (d) What is the role of the inter-professional team in providing quality home care?

Observation notes and interview transcripts were analyzed to explore working practices and to identify coordination mechanisms (Schmidt and Simone 1996).

## 6 Findings

The members of the inter-professional care team are required to have a continuous arrangement and adjusting of their work practices, and the protocol/plan of care is negotiated with the patients and their families. Therefore, providing quality home care needs dynamic coordination mechanisms. Through our observation and data analysis we identified some coordination mechanisms (Schmidt and Simone 1996), which support collaboration among the members of the home care teams.

After an overview of the work practices of the team members, through a case study, this section describes the coordinative artifacts in place and highlights the important factors contributing in a new vision of providing a high quality home care.

Unlike many organizational settings where collaboration occurs in fairly stable teams or places, inter-professional home care teams are dynamic and each team member may participate in multiple home care teams.

Team members are changed depending on the evolution of the patient's health and social situation, and on the patient's perception of their quality of life. Every change in the configuration of the team is negotiated collectively, together with

the patient and their family caregivers. For instance, the team treated a paraplegic patient suffering from epilepsy at home, with his wife as the principle caregiver. This summer, the wife had to be absent for a month, which prompted the team to adapt the care plan. They decided to amend the frequency of their visits and to add a new home care helper to the team, to compensate the absence of the wife.

Patient and informal (mainly family) caregivers might be active in the care protocol, providing information and signaling problems, but this participation depends on the situation of the patient. We are going to illustrate this issue with the case of one diabetic patient and his management of his condition in collaboration with the home care team.

Bernard, like many people suffering from diabetes, is also suffering from heart disease and has a high blood pressure. Bernard's family doctor manages a lot of his care, but Bernard had to go three times to emergency during the last year because of problems that arose late at night, when his doctor's office is closed.

He and his family doctor have just enrolled in the e-maison médicale association. Being a member, the family doctor was able to contact other professionals in the area (the network provides an address book on its web site) and to offer Bernard the service of a nurse to control the observance of his treatment.

The small team made of the family doctor, the nurse and Bernard met in Bernard's home, and together they created a care plan that was suitable for Bernard's lifestyle.

The team set a liaison notebook (Fig. 1) to record information about Bernard's status, and Bernard was asked to record the results of his blood glucose tests and the meals he eats in different times of the day. In the beginning, the nurse was coming twice a day (morning and evening) to measure the tension and sugar level of the patient. Based on the test results and the type of food that Bernard ate or was planning to eat during the day, the nurse was able to decide the necessary insulin dose, and records all of that in the liaison notebook.

This communication between the nurse and the doctor about Bernard's status helped Bernard to avoid the evening emergencies.

After three months, thanks to the nurse's frequent tips, Bernard was able to manage his condition, and the team decided to reduce the number of visits to once

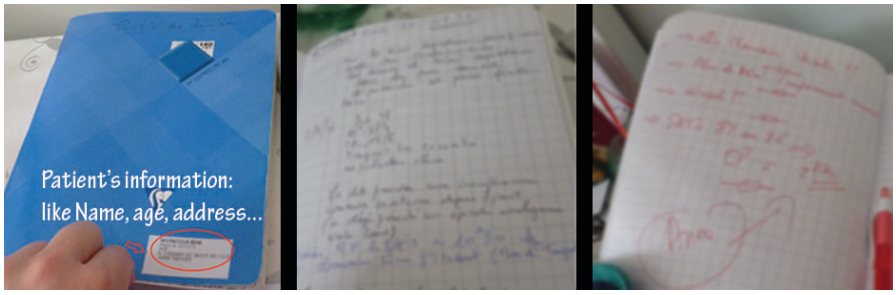


**Fig. 1:** Liaison notebook, in patient's home.

a day only if Bernard would go on recording all necessary information for the rest of the day.

### *6.1 Coordinative Artifacts for the Different Information Flows*

By observing the collaborative practices of this association, we can identify two types of information flow and related artifacts:

(1) Information on the patient's situation that has to be shared for the global care protocol to take place. This kind of information has to be recorded for other team members to get it, and might need collective reactions from all or some of the team members. For instance, a speech therapist is signaling the degradation in patient capacity of speaking due to dental problem which requires consulting a dentist.

The tool that is used for this objective of sharing information and making decision among the team members is the "liaison" notebook (Fig. 1), a simple notebook, which allows the different actors to add comments about the general status of the patient. It could be, for instance, measurements that have been requested by the physician (such as temperature, weight, blood pressure). In addition, the liaison notebook contains contact information (team members and family caregivers).

The information that is shared in the liaison notebook is considered as a shared secret; here we have to mention that the team members are aware that some of this information should not be shared officially because the law restricts communicating patient's medical information to non-health professionals. When the physician visits the patient, they review the notebooks and answer questions and requests made by other team members, for example if team member recommends nursing services or physiotherapy (for the patient to be reimbursed by social security services).

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**Fig. 2:** Notebook for diabetic patients.

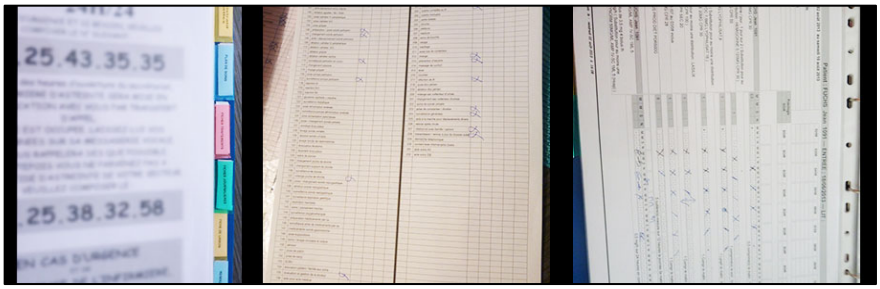


**Fig. 3:** Follow-up documents for hospitalization at home.

The freestyle liaison notebook is sometimes accompanied or replaced by more structured, specialized notebooks for certain diseases, like the "diabetic surveillance" notebook for diabetic patients (Fig. 2). Also, in the case of collaborating with more structured health settings, like hospitalization at home which is provided when the patient needs heavier treatments, with more sophisticated medical devices, a folder containing patient's follow-up information is used (Fig. 3).

The use of these different communication logs ensure a smooth transfer of information about the care which is provided to the patient and the administrative tasks that have been done or have to be done for the patient to receive help and/or support. This is essential because the team members have few opportunities to meet face-to-face due to their private work status.

(2) Medical or social information used by a team member to make a decision in the scope of their competence. For example, the result of blood glucose test for a diabetic patient in order to be able to make a decision about the dose of insulin to administer.

The member of the team keeps this kind of information in informal ways, like notes on the box of medications (Fig. 4). This information is the rationale behind their action and it might be communicated to other team members if necessary.

### *6.2 Collective Adjustments and Related Artifacts*

Periodic meetings are arranged between the members of the home care team, the patient and the family caregivers. The frequency of these meetings depends on the evolution of the patient status (the frequency varies from every three months to every two years). The meeting is held at the patient's home to study the patient's

**Fig. 4:** Box of medications, with notes on it.

situation, and modifies or not their treatment/ care plan.

Meetings are also held in the case of social/medical emergency. Normally, these meetings do not include all the team members; the participation of a member depends on the relevance of the agenda to them (according to their roles in the team).

Delivering care in home environment involves a lot of negotiations, which are done mainly in the periodic meetings. For more daily or weekly-based adjustment, the team members use mobile phone and text messages to adjust their agenda. Team members need to adjust with the socio-professional activities of the patient and their family, for example if the patient is visiting relatives or will go out for dinner. It means that a lot of flexibility in organizing and adjusting appointments is needed. In addition, the unpredictable nature of the work practices of the team members makes it sometimes difficult to keep punctuality.

### *6.3 The Patient at the Center of the Approach*

We have noticed the influence of shifting focus from providing healthcare to well-being. In this new innovative approach that we have observed, the will and preferences of the patient direct their care plans. Team members play an important role in continually training the patient to manage their condition and to be aware of the impact of their choices.

Also, this innovative approach fosters the team members to deal with the patient and their environment globally, and to go beyond the fee-based service, which is still the one in place in France.

## 7 Design implications

Many studies focus on developing and deploying applications and devices to support long-term interaction between the patient, living with a chronic condition, and their clinician, e.g.(Mamykina et al. 2008; Balaam et al. 2011; Larsen and Bardram 2008).

However, the collaboration between the members of an inter-professional care team in home environment has been rarely studied. Challenges identified in the current study suggest that more robust technologies are needed to support coordination and activity awareness among the members of an inter-professional care team in the home care context. Specifically, the design of such technologies should encompass the concept of “dynamic team” where the team structure is always negotiated with the patient, their entourage, and other team members.

While designing future healthcare systems to support this kind of organization, one should consider also the double status of the team members: being at the same time a private worker and the member of a team.

This section presents two principles to follow when designing a system for supporting collaborative practices among the members of an inter-professional care team delivering home care.

### *7.1 Supporting Flexible Teams and Practices*

The dynamic structure of the team depends on the evolution of the patient's care plan as well as their social and medical conditions. In addition, the private status of team members gives them the choice to stop working with a patient or to change their area of practice.

A system supporting dynamic home care teams needs to take into consideration this constant evolution of the team members. The difficulty resides in the non-standardization of the work practices. All the private health professionals may have different ways of administrating care and documenting it and it is then a challenge to propose a unified way of documenting and using information between team members. A support system has then to be able to create flexible ways of passing the information between current team members belonging to different professions and between old and new team members.

### *7.2 Supporting Different Levels of Information Flows*

Our study showed that the information flows between the team members could be classified in two different levels: shared information and individual information supporting rationale tracking. A computer-based system may have a good potential to improve the situation by replacing and/or supplementing some existing ways of documenting and sharing information in a manner that ensures a better availability and more comprehensive information ensemble.

Understanding the nuanced relationship between the common shared information and the individual information can help the design preserving and managing the use and ownership of these two kinds of information.

As the shared information is created by a wide range of team members, it is for instance important to understand the roles the team members play in the common shared information flow, and the different artifacts they are using.

Similarly, we need to consider how individual information documentation (which may be shared with one or more members if necessary) can be supported with technology without requiring extra effort from users to duplicate the information.

In addition, we have observed that each team member creates and customizes some form of personal notes that serve as the primary coordinative artifact for facilitating tasks performance during daily visits. For example, they use a list with the interventions to do this day, information extracted from their agenda, they add information and remarks concerning the intervention in patient's home, and then reorganizes the information in the agenda (if they want to keep trace of that), or indicate any change on the liaison notebook. We then suggest that designing a system for supporting this teamwork should allow the team members to customize the presentation of the individual information they use to support their daily work practices.

## 8 Conclusion

This paper is reporting one of the observations and analyses made in a large French project funded by the "inter-ministries fund" aims at defining a more integrated care system, for patients treated at home, and the computer-based system that could support this new integrated approach.

We think that a good understanding of effective collaborative practices, which are taking place in local initiatives, is a prerequisite to design the most appropriate devices and services. In this paper we have investigated the coordination practices used by a network of local private care professionals in order to deliver a good quality of home care.

Our analysis of these work practices led us to identify different information flows and coordinative artifacts to support these flows. Following this analysis, we suggested two main principles for designing a collaborative system to support the work of inter-professional home care teams: Supporting flexible dynamic team collaboration and supporting different levels of information flows.

Further research is needed in: (1) the role of the patient in this care delivery approach. In contrast with more classical formal care settings, this integrated approach demands a greater participation of the patients and their caregivers. This implication might vary depending on the patient's health and social situation. (2) The necessary arrangements that are made when collaborating with more structured organizations, like hospitals.

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