

## Research and Theory

### ***Special issue: Infrastructures to support integrated care: connecting across institutional and professional boundaries -***

# **Infrastructural arrangements for integrated care: implementing an electronic nursing plan in a psychogeriatric ward**

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## **Abstract**

**Purpose:** The paper contributes to the conceptualisation of “integrated care” in heterogeneous work practices. A dynamic perspective is developed, emphasising how integrated care is malleable, open, and achieved in practice. Furthermore, we explore the role of nursing plans in integrated care practices, underscoring the inherent difficulties of building one common infrastructural system for integrated care.

**Methods:** Empirically, we studied the implementation of an electronic nursing plan in a psychiatric ward at the University Hospital of North Norway. We conducted 80 hours of participant observation and 15 interviews.

**Results:** While the nursing plan was successful as a formal tool among the nurses, it was of limited use *in practice* where integrated care was carried out. In some instances, the use of the nursing plan even undermined integrated care.

**Conclusion:** Integrated care is not a constant entity, but is much more situated and temporal in character. A new infrastructural system for integrated care should not be envisioned as *replacing* most of the existing information sources, but rather seen as an extension to the heterogeneous ensemble of existing ones.

## **Keywords**

**integrated care, infrastructural systems, nursing plan, interdisciplinary work**

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## **Introduction**

The health care sectors in all Western countries are profoundly fragmented across technical, organisational and professional boundaries. This creates a fragmented health care *service* for patients [1,2], which undermines efforts of transforming organisations towards more collaborative, process-oriented modes of working.

This motivates the notion of “integrated care” which expresses commitments towards creating coherent and effective health care services across disciplinary and institutional boundaries [3,4]. Integrated care carries the promise of “cost-effectiveness, reduction in length of hospital stay, reduction in inappropriate hospitalisation and decrease in admission to long-term care” [5].

Despite its common use and perceived attractiveness, however, the integrated care concept remains notoriously fuzzy [6–8]. “[I]t is often used by different people to mean different things” [7] and it partly overlaps with notions such as shared and interdisciplinary care in models of collaborative care [4]. Without engaging in a theoretical debate of what integrated care really *is*, we follow Kodner and Spreeuwenberg [7] when they argue that this concept can only be understood by examining its context. For instance, Shamian and LeClair [8] question its value in a Canadian context, as the lack of competition in dispersed geographic areas will effectively create a monopoly.

Despite the different conceptualisations of integrated care, most of them presuppose an infrastructural arrangement to overcome service fragmentation, institutional differences and interdisciplinary boundaries

[5,7,8]. Infrastructural arrangements denote the various entities that support integrative initiatives, such as the electronic patient record, standards, procedures, and classification schemes. Nursing care plans feed directly into this agenda. Positioned at the core of patient care delivery, nursing plans are intended to promote improved planning of the patient case, higher quality of care and better cost containment [9,10]. In addition, it is assumed that a nursing plan provides for appropriate treatment and continuity of care for the patient within and across institutional boundaries [10,11].

With this as our point of departure, we ask: What is the nature of integrated care, and how is it achieved in *practice*? What is the role of nursing plans in integrated care?

Based on these questions, we contribute to the conceptualisation of “integrated care” in heterogeneous work practices. A dynamic perspective on integrated care has been developed, emphasising how it is malleable, open, and achieved in practice. Furthermore, we explore the role of nursing plans in integrated care and underscore the inherent difficulties of building one common infrastructural system for integrated care.

Empirically, we draw on the implementation of nursing care plans at the psychogeriatric ward in the University Hospital of North Norway (UNN). The ward serves elderly patients suffering from a combination of chronic and psychiatric conditions, which requires frequent collaboration across professional boundaries (nursing, medicine, physiotherapy, etc.), especially relevant in an integrated care approach [5,8]. The nursing plan was expected to improve the quality of nursing, to provide predictability as well as a clear overview, and to serve as a basis for improved articulation of the nurses’ work with respect to the other professions. However, while the nursing plan was successful as a formal tool among the nurses, it was of limited use *in practice* (even for nurses), for example during admission of patients, in nursing handover conferences, and in interdisciplinary meetings.

Specifically, we proceed as follows: Firstly, we examine the notion of integrated care and how it unfolds in interdisciplinary meetings by focussing on how, and under which conditions, the professional perspectives of physicians and nurses interlock. Secondly, we explore the role of the existing information sources (formal/informal, written/oral and external/internal) in practice, and particularly how the nursing plan effectively depends on these sources (especially the informal ones) to serve as a successful formal tool. Thirdly, we explore how creating order in one

place simultaneously created disorder in another. The implementation of the nursing plan had an unexpected consequence related to interdisciplinary work, as order established for the nurses resulted in corresponding disorder for physicians and patients.

The remainder of this paper is organised as follows. First, we theorise on the notion of integrated care and nursing plans. We then describe the setting for our empirical investigation and describe the method used, followed by a description of the case. Finally, we analyse the case, and conclude by providing some implications for infrastructural arrangements for integrated care.

## Theorising integrated care and nursing plans

The ageing population together with the growing and more complex presentation of chronic, long-standing illnesses is progressively putting more pressure on healthcare providers to streamline health care services. Throughout the course of their illness, patients today have to relate to a variety of separate areas of expertise. The single doctor–patient relationship is increasingly being replaced by a more integrated approach to treatment and care, where a given patient case is the responsibility of a team of professionals, each specialising in one particular aspect of care [12,13]. The notion of integrated care is commonly used to denote a commitment to creating coherent and effective health care services within and across disciplinary and institutional boundaries [7,14].

Despite its common use and perceived attractiveness, the concept of integrated care is heavily debated in the literature (see e.g. [5–8,14,15]). Kodner and Spreeuwenberg [7] even go as far as describing it as the “modern-day Tower of Babel”. The existence of related, partly overlapping concepts such as shared care [16,17], continuity of care [18,19] and interdisciplinary care [4] are but a few evident expressions of this. Vondeling [6] notes:

in practice, integrated care appears in a variety of forms: ‘transmural care’, ‘shared care’, ‘disease management’, ‘integral care’, ‘comprehensive care’, ‘continuing care’, ‘intermediate care’ and so on, partly reflecting different countries of origin and differences in scope and approach

At the heart of the debate are somewhat conflicting assumptions of what integrated care should achieve. For example, Kodner and Spreeuwenberg [7] distinguish between consumer- and provider-oriented integration, Reed et al. [5] between health and social

care integration, and Leatt et al. [15] between functional and clinical integration. According to Vondeling [6], these differences also reflect the position one takes in approaching the integrated care concept—top-down or bottom-up:

some authors are inclined to define integration predominantly as a hierarchical or 'top-down' process driven by generalised organisational exigencies for perfection and optimisation, whereas other authors promote a patient-centred or 'bottom-up' view [6]

There are also conflicting views on what the notion of integrated care should include. For instance, in a critical response to the model of integrated care for the Canadian healthcare service put forward by Leatt et al. [15], Shamian and LeClair [8] contend that its potential contribution in this context is of little value as it fails to define the role of the professionals (i.e. physicians and nurses) within the integrated delivery system (IDS). They state:

If we are truly interested in building IDSs (...) then it is essential to understand how professional systems should be managed. It is our opinion that part of the negative fallout of the restructuring in the 1990s can be directly linked to the misfit of management structures and professional management perspectives [8]

Rather than being surprised or confused by this, we need to recognise that the ambiguity over the exact meaning of 'integrated care' expresses both the complexity of the notion as well as an overall commitment to collaborative care. Thus, rather than privileging one of these perspectives as a constant entity, in this paper we endeavour to examine the phenomenon in context. We do so by focussing on *how* integrated care is achieved in practice as an emergent, collaborative and shared effort.

Given the widespread deployment of information and communication technology in the health service, infrastructural arrangements are increasingly seen as essential in integrating the prevailing service fragmentation (see for instance [3,5,7,8]). Nurses are often referred to as the ones "who weave together the many facets of the [health care] service and create order in a fast flowing and turbulent work environment" [20]. Hence, their associated tool, the nursing plan, is bound to play a key role in strategies for integrated care:

[The nursing plan's] primary purpose is to ensure the individuality and continuity of care (...) When documentation is accurate, individual, pertinent and up-to-date, it promotes consistency and effective communication between nurses and the other team members involved in care. [21]

In the Norwegian healthcare context it is even suggested that the nursing plan is not limited to use by nurses, as the:

documentation of this work-process [nursing process] is also called the care plan, it is interdisciplinary and can be used by all professions. [22]

Basically, a nursing plan is an overview of probable nurse-related diagnoses (problems) for a particular patient group combined with relevant interventions. At the core of the nursing plan is its shared terminology. Similar to the ICD for physicians, the classification system embedded in the nursing plan is tailored to nurses' work. The nurses apply this terminology to describe the patients' problem (i.e. nurse diagnoses) and link this to one or more interventions, detailing what to do in certain situations and several outcomes to enable an evaluation of what nursing care can achieve. Some of the most well-known systems are the taxonomy of the North American Nursing Diagnosis Association (NANDA), the Nursing Intervention Classification (NIC), the Nursing Outcome Classification (NOC) and the International Classification on Nursing Practice (ICNP) (see [23]).

Another "promise" associated with the electronic nursing plans is that during the nursing handover conferences it will replace many existing information sources dispersed throughout the hospital:

[The nursing handovers] however, often lack formal structure and this is compounded by a lack of guidelines for the nurse giving the report. Consequently, the information presented may be irrelevant, repetitive, speculative or contained in other information sources [9]

However, despite these high expectations, the actual use of nursing plans has so far been disappointing. Studies have indicated that "nurses have problems integrating the nursing process and care planning into their daily record-keeping" [24]. In a survey cited by Sexton et al. [9], "nursing care plans were referred to in handover only 1% of the time and this was probably because care plans were not being updated". One explanation may be that the "nursing process is thought to be time-consuming to document" and its value was questioned [25].

In sum, both the contested nature of integrated care and the (not yet fulfilled) potential of nursing plans in contributing to coherent care for patients serve as a basis for our empirical investigation and analysis.

## Method

The research was conducted at the University Hospital of North Norway (UNN), which has approximately 5000 employees, including 450 physicians and 1000 nurses. The hospital has 600 beds, of which 150 are psychiatric. The actual study took place in the psychogeriatric ward, which is one of four wards in the Department of Special Psychiatry.

The empirical material was collected from May to December 2005. The main methods of data collection alternated between observation of work and qualitative interviews, a combination of techniques well known within the tradition of interpretative information systems research [26,27]. In total we conducted 80 hours of observation, including nursing handovers, interdisciplinary meetings (e.g. cardex and treatment meetings), and the process of updating the nursing plan and writing reports. Handwritten field notes were transcribed shortly after each observation session. While observing, we made an effort to cover different types of actors and interactions in order to highlight potentially different interpretations of what was going on.

Fifteen interviews were carried out. The interviews lasted an average of 1–1.5 hours. In addition, we spent some time in project meetings as well as studying different documents, such as project specifications, newsletters and training material. The overall process of collecting the data was open-ended and iterative, with the earlier stages being more explorative than the later ones.

The analysis of the data is based on a hermeneutic approach where a complex whole is understood “from preconceptions about the meanings of its parts and their interrelationships” [27]. This implies that the different sources of field data are all taken into consideration in the interpretation process. The method included relatively detailed case write-ups (see for instance [28]) followed by an examination of the data for potential analytical themes.

Preliminary results have been presented and discussed at several seminars in various settings, including the users in the hospital department, research colleagues at the Norwegian Centre of Electronic Health Records, the full board of directors of the EPR vendor, and finally the international workshop on Infrastructures for Health Care: Connecting Practices across Institutional and Professional Boundaries in Copenhagen 2006.

## Case

### Work in the psychogeriatric ward

In the psychogeriatric ward, patients are 65 years or older, and have typically been diagnosed with psychiatric disorders such as dementia or anxiety. Some are extremely psychotic and constitute a danger to themselves and others. To maintain a stable environment, all rooms are private. Hospitalisation lasts an average of 6–8 weeks, although in some cases it continues for several months.

In addition to physicians and psychologists who visit several times a week, there is a staff of roughly 45 environmental workers in the ward, including nurses, unskilled assistants/substitutes, social workers, occupational therapists and physiotherapists. Turnover is fairly high, with up to five new workers starting there each month. Many of these are unskilled and not trained in the healthcare service.

Work in the ward is highly interdisciplinary. Environmental therapy is considered to be of crucial importance, with observations made by nurses serving as a foundation for the treatment that is provided. Hence proper communication and coordination of work across professional boundaries and work shifts are essential in providing a stable environment for the patients. As the physicians have responsibility for patients in several wards, interdisciplinary interaction in this ward is primarily visible in regular meetings.

Patients are admitted to the ward based on traditional referrals or as emergencies. New patient cases are discussed in the weekly admission meeting, and decisions are made regarding which patients are eligible to be admitted. When the patients arrive, which takes place some weeks later except for emergencies), the first of many *treatment meetings* is held. This is a meeting between the patient (or the patient's appointed guardian) and a carefully designed team of professionals where the current treatment approach is discussed. During hospitalisation, the frequency and length of treatment meetings varies depending on the complexity of the case and the health personnel's familiarity with it.

The large interdisciplinary *cardex meeting*, on the other hand, is held twice a week and includes all members of the staff as well as the visiting physicians and psychologists. The term “cardex” encompasses the various documents holding information about a patient, in particular the medical chart. The purpose of the meeting is to discuss care and treatment for all of the ward's patients.

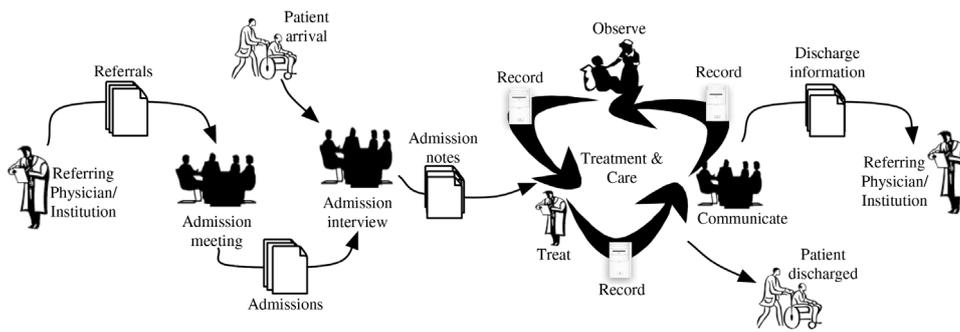


Figure 1. The flow of information related to patients' course through the ward.

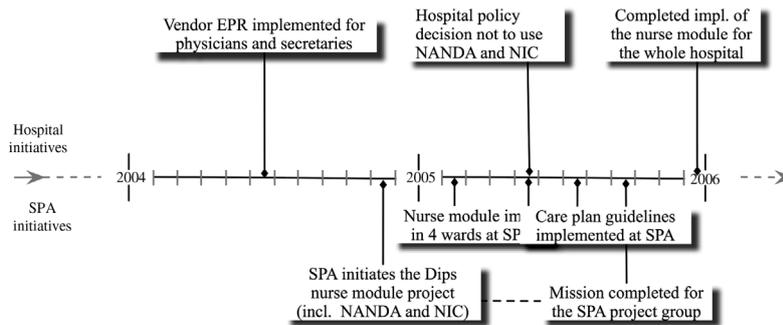


Figure 2. The local nursing project at SPA in the context of the larger hospital project.

When patients are discharged, a final treatment meeting is held in order to prepare both the patient and the local caregivers who will assume responsibility for the patient. Figure 1 illustrates the patient and information flow in the ward.

## The nursing plan project

The electronic nursing module was introduced as part of a larger implementation of a new Electronic Patient Record (EPR) system used throughout the hospital. The decision to replace the old EPR in 2003 marked the start of a prolonged initiative to create an all-encompassing information infrastructure across departmental and professional boundaries with the objective of establishing a 'paperless hospital'. In Figure 2, the hospital project is illustrated together with the local project at the Department of Special Psychiatry (SPA):

The Department of Special Psychiatry was highly motivated to implement the nursing module in its four wards.

Aligned with ongoing efforts to promote the nursing profession in the health sector, the plan was expected to improve efficiency and enable a better overview of the planning process. It also implied an emphasis on the nursing perspective, improving the accuracy of communication from nurses to the other professions:

I believe that this system [care plans] might help us better articulate what we do. I believe this is a huge challenge within the psychiatric sector that we are able to explain to others what we do and how we think (Nurse)

The implementation took place over a half-year period. Three employees (two nurses and one secretary) were recruited internally to run the project. For two days a week they worked with the implementation of electronic nursing documentation in the department's four wards. After some months of in-house training, the system was introduced in February 2005, both in the psychogeriatric ward and in the three other wards in the department. In May 2005, all wards had started to use the new nursing module.

The nursing plan included functionality for writing daily reports and for creating nursing care plans. Each patient had one plan. The screen was divided into two parts. In the upper screen was the report section, where users wrote reports on a patient several (usually three) times a day. In this section, the users had the flexibility of writing free text, i.e. constructing a narrative of the patients' problems. The lower screen was the actual nursing plan. Unlike the report it was highly structured and contained international codes for diagnoses and interventions.

The codes were based on the NANDA and NIC classification systems. One NANDA diagnosis might

Treatment elements	FA	Frequency/situation	Start	End	Status
<b>Nursing diagnoses</b>					
Anxiety -- rt confusion	2		09.08.05		Active
Impaired mucous membrane	4		30.08.05		Active
Insufficient sleep	8		10.08.05		Active
<b>Nursing interventions / Ordinances</b>					
Reducing anxiety -- Objective: security, patient trust	2		09.08.05		Active
Wake up before breakfast		Always	30.08.05		Active
Encourage sleep	8		09.08.05		Active
Make sure the patient get enough sleep			09.08.05		Active
Consider medication		Together with physician	09.08.05		Active
Record sleeping pattern		Make list, record in report	09.08.05		Active
Help patient maintain diurnal rythm			09.08.05		Active
Sense of reality	2		09.08.05		Active
Clear messages about what to be done during the day		Written, Oral	09.08.05		Active
Improve feeling of security -- introduce yourself, tell when you are about to finish your watch, offer contact	2		23.08.05		-----
Heal wound -- No denture lower jaw; objective: prevent wound in the gums	6		30.08.05		-----
Activity-therapy -- follow week-schedule	7		23.08.05		-----
<b>Independent nursing ordinances</b>					

Figure 3. The nursing plan with diagnosis, interventions and instructions.

spawn one or several NIC interventions. For each NIC intervention there might be several instructions). These were written as plain text extensions in the plan (see Figure 3).

The user writing the report was expected to use the plan with its diagnosis, interventions and instructions as a basis for the reports:

The goal is to write as little as possible in the report, we shall only write what deviates from the nursing plan (Project group nurse)

This implied that the report and the nursing plan were mutually dependent. Users had to read both to get the complete picture of the case. The plan provided the current status of the patients, nursing diagnosis (problems) and interventions. However, to see what had happened over time, and how the nursing plan had changed, as well as how it might change in the future, the user needed to read the reports linked to the plan.

Overall, the nurses found the implementation of the nursing plan to be successful. It was also argued that the plan facilitated communication and had potential:

People attending the meetings have already read the reports and the nursing plans. So now we focus on the core of the case (...) and we don't have to read everything aloud in the meetings (Nurse).

After having used the system for a while, I think that we have improved and have become more precise in what we put into reports (Nurse)

## Analysis

The analysis is structured as follows: Firstly, we present the nature of integrated care (manifested by the

intersection points of physicians and nurses) as situated, temporal, regularly (re)negotiated and achieved in practice. Secondly, we discuss how unofficial and heterogeneous information sources that initially were to be removed actually became a prerequisite for the official nursing plan. Thirdly, we analyse the unintentional effect of the nursing plan. The physicians, who previously had valued the nurses' written reports, were now prohibited from using it.

## Integrated care: temporal, contingent and achieved in practice

Instead of perceiving integrated care as a constant entity, we argue that integrated care is a short-lived arrangement, achieved in practice, which constantly needs to be renegotiated. We develop our argument by focussing on the negotiations between physicians and nurses in interdisciplinary meetings. Shamian and LeClair [8] underscore that "it is paramount to understand that each professional group—physicians, nurses and others—has its own culture and sociology". In their research on oncology protocols, Timmermans and Berg [29] argue along similar lines:

The doctor who orders the protocol, while, for example, following a research trajectory, sees the patient as one case in a project. The trajectory of the nurse who administers the protocol might be characterised by the tasks of her shift

Drawing on these insights, we argue that integrated care (especially its interdisciplinary dimension) can be seen as professional work conducted in parallel, with only brief intersection points. Consider the first treatment meeting where the professional team of care providers tries to make sense of the case, including collecting information from very different information

sources. Notice in particular how professional boundaries delimiting the work of physicians and of nurses are being maintained and 'reinforced':

Typically the nurses would be delegated the task of collecting information from home care, nursing homes and the like. The physician [responsible therapist] would be responsible for talking to the primary [referring] physician and ensuring that appropriate testing and examinations are carried out. For instance, Madres, MMS, Obs dementia (...) and filling out the proper forms, etc. The psychologists carry out neuropsychological testing (...), we have a social worker who takes care of the individual plan, the physiotherapist has to do his thing, and so on (Physician)

A similar situation occurs when the patients are discharged from the ward, only now in the opposite direction. The nurses prepare their own summaries for the nursing home, while the physician produces a formal discharge letter for the general practitioner. Accordingly, different artefacts and information sources (discharge letters, nursing summaries, etc.) enforce different professional perspectives.

However, if we look more closely at the heart of the interdisciplinary work in the ward, namely the interdisciplinary meetings, we can sense how the intersection points between physicians and nurses are really of a *momentary and contingent* character. The following field-note extract from a cardex meeting illustrates this:

The coordinator (an experienced nurse) is managing the process. Positioned behind the computer, she is going through the information for all the patients in the ward based on the patient ward list in the EPR. Also seated at the table are the three physicians. On the table in front of them is a large binder holding the medical cardexes as well as the Physician's Desk Reference book. The rest of the staff are spread around the room. Based on the nursing reports in the EPR, the nurse coordinator has started elaborating on recent changes and the current status of a patient with anxiety and extreme hypomania:

*Coordinator: "The patient claims that she has benefited from earlier stays"*

*Psychologist: "Her son says that she has been taking better care of herself since the transfer to the nursing home?"*

Having remained in the background silently listening to the discussion, the head physician is interrupted by the psychologist:

*Head physician: "Only standard specimens have been ordered for this patient...?"*

The head physician's head is bowed as he carefully reads the laboratory requisition lying on the table in front of him. He has the full attention of the other two physicians in the room. With the physicians' attention

on the laboratory requisition, one of the nurses has started talking to the rest of the staff:

*Nurse C: "The patient had a tendency to complain about her own disorder. We have however made it clear to her that there should be no talking about her own disorder in the living room."*

With this comment, nurse C is in fact not responding to the comment made by the head physician, but rather adding details to the account put forward by the coordinator. The staffs' attention is directed towards the coordinator. Meanwhile, the three physicians have quietly started an internal discussion about the specimens ordered. They are still occupied in this discussion as the coordinator ends the overall brief (signalling that the nurses are done) by asking if anyone has any further questions. There is no response and they move on to the next patient.

For the next patient, a similar situation emerges. In this case, however, one of the physicians replies to what the coordinating nurse says:

*Coordinator: "The patient's mood is unstable. He starts sweating rather quickly. Participated on a trip to Prestevannet earlier today and was very satisfied with that"...*

Physician A, whose attention suddenly seems to have been attracted, interrupts the coordinator:

*Physician A: "Sweating???"*

*Coordinator: "Well... like he was tense ..."*

Another physician, Physician B, writes something into the medical cardex, while at the same time looking in the Physician's Desk Reference (a book describing medication).

*Physician B: "Maybe we should reduce this specific medication"*

Physician B points at the patient chart, whereupon a discussion about medication starts between the three physicians. Physician B grabs the Physician's Desk Reference book and opens it again. The rest of the staff is silently listening; some are occupied with writing information into their own personal notebooks. For instance, a nurse makes a note in her notebook to remember to call the homecare service, and the psychologist writes something in her personal calendar to remind her that a specific test needs to be taken. The professionals collectively agree on booking a treatment meeting for this patient.

Having completed the meeting, the various professionals (the nurses, physician, psychologist, etc.) would often write separate reports on what has been said and decided in the meeting.

Although both nurses and physicians want the best for the patient, they have different goals, practices and perspectives, making complete information sharing illusive. Work around a patient should rather be seen as taking place in parallel paths. At certain (intersection) points in the meetings, the various professionals poll the others, checking for potential changes to their own work.

In this light, the nursing plan is merely one element in a larger infrastructural arrangement, reflecting the nursing perspective on the care process as the cardex does for the physicians.

## Maintaining the formal nursing plan through informal sources

A major aim of the nursing plan was to replace many of the existing heterogeneous, redundant and informal information sources at the psychogeriatric ward. However, the nursing plan was hardly used in practice—for example, when patients were admitted, during nursing handover conferences and in interdisciplinary meetings. Instead, the old heterogeneous information sources were used and thus represented a condition for the success of the nursing plan.

Interdisciplinary meetings entailed collecting, checking and evaluating information from numerous information sources. For this reason, the first treatment meeting, when patients were admitted, involved collating information from other institutions, such as nursing homes, home care services, general practitioners' practices, etc. In later treatment meetings, when the health personnel knew the patient better, the practice shifted towards producing and sharing information internally. In these encounters, the observations made by the nurses were crucial:

In our ward, medical treatment has little effect on the patients. Therefore, environmental therapy (...) and nurses' observations [of patients] and [subsequently their] interpretations become especially important (Physician)

Discussing the observations in the meetings involves a lot of participants and takes most of the time (...) the physicians contribute with advice in this process, although they have the formal responsibility for the treatment (Nurse)

The nurses regularly used personal notebooks in interdisciplinary meetings to remind them of recent, and important, observations. In addition, they would regularly draw on schemes for recording information, which had been used when observing and working with patients:

We have different types of schemes for recording information where we document anxiousness, sleep, worries, shouting, anger, eating and drinking, etc. Then we have different colours for each type in order to see what is what and to keep a clear overview, for instance, sleeping is yellow, anxiousness and worries are blue (Nurse)

The physicians, on the other hand, would use the paper-based medical cardex, which contains informa-

tion on prescriptions, medications and associated dosages.

Minutes were also frequently taken during interdisciplinary meetings. Typically, a nurse was assigned to take the minutes. The nurses' task was to record vital questions and decisions in the minutes. To make the information readily available to those not present, he or she would then copy it into the written report.

Another information source, frequently used in interdisciplinary meetings, was the large whiteboard found in the common meeting room. The whiteboard contained entries for all admitted patients, indicating the status for each of them. Consider the following field-note extract taken during the cardex meeting:

A nurse is reporting on a patient who is suffering from anxiety, spending a lot of time alone and tearing apart her social network. In addition, the patient is extremely agitated, almost hypomanic (...). While the nurse is talking, the rest of the staff is preoccupied making notes in their private notebooks. However, one of the physicians has moved to the whiteboard. He updates the field called going-out-status and writes "go with", which means that the patient is not allowed leaving the ward without being accompanied by a nurse

Typically the nurses would make notes in their private notebooks, or on slips of paper, during such sessions. The following field-note extracts underscore the importance of these personalised notebooks. The note was taken during a treatment meeting where a patient was about to be discharged from the hospital:

The meeting starts without the patient present. In the room are a nurse, a social worker, a physician and an occupational therapist. They discuss potential strategies for handing over the patient to the local home care service. During the 10-minute discussion, they all make extensive notes in their own personal notebooks. When the patient enters the room, the personnel put their notebooks away so as not to reveal their content to the patient. They also make sure to place the patient on a chair with her back to the whiteboard, as it contains up-to-date clinical information about all of the patients in the ward. The conversation starts with the physician explaining the diagnosis (diabetes) followed by the nurse giving practical advice about the home care service (...). After the patient has left the room, the staff have a short debriefing based on the discussion with the patient, and they update their notebooks extensively.

The clinical data are often entered some time after they have been gathered [30]. In our case, the actual updating of the nursing plan usually occurred during the writing of the nursing reports, typically some minutes before the nursing handover conferences.

The nurses then used their personal notebooks, data recording schemes, whiteboard information, and other information sources as input to the nursing plan.

While it was considered important to have a complete plan, it also became evident that without any boundaries, the plans for patients with complex conditions would grow substantially and thus make it difficult to keep track of its content. As one nurse said while writing a report and updating the plan for a patient with stroke, anxiety and other complicated conditions:

We could for sure have written 15 pages on this patient because there are so many things that are important.  
(Nurse)

In dealing with this, the users had to decide carefully what to include and what to omit in the plan. As Berg et al. [30] argue: “not all of the data end up in the record, only a ‘representative’ selection”. In concrete terms then, and because the documentation should reflect that this was a psychiatric ward, somatic conditions were included in the plan to a lesser degree. For psychiatric patients with stroke, this meant that many of the measures and instructions related to the general care and management of stroke were omitted.

In sum, the nursing plan was *detached* from the process of work in the meetings. Instead, the existing heterogeneous (informal/formal and oral/written) documentation and communication practice prevailed. It was effectively this heterogeneity that contributed to interdisciplinary work *in situ*, and which finally made up for, and served as a premise for a good nursing plan.

## Creating disorder out of order

Berg and Timmermans [31] highlight how the ordering effects simultaneously produce disordering effects. They argue that “[T]he order and its disorder (...) are engaged in a spiralling relationship—they need and embody each other”. The system may have unexpected consequences, as the order that the system creates for some creates a corresponding disorder for others. In a similar way, Law and Singleton [32] argue that objects (information systems) inherently may constitute several realities, and may sometimes be “complex, multiple and (in some cases) mutually exclusive”. Below we illustrate how the implementation of nursing plans unintentionally subverted the possibilities for interdisciplinary cooperation, i.e. how benefits for nurses simultaneously caused disadvantages for psychologist and medical doctors.

Earlier, we pointed out how the psychogeriatric ward depended on well-functioning interdisciplinary work

between the nurses on one hand and the physicians and psychologists on the other. The narrative contained in the old reports had been the glue in this collaboration:

Several of the nurses sum up with their own words after we have had a treatment meeting [for a patient] (...) they write good and extensive notes, especially when something out of the ordinary has happened (...) Therefore, when I write my own report, I often refer to the report made by the nurse (Psychologist)

In addition, in the old paper-based version of the reports, other professionals sometimes added amendments to the reports originally written by one of the nursing staff, thus making the report more complete. An example from one of the paper-based reports is when a physiotherapist expanded on a comment from the nurse, who had written that the patient had exercised with the physiotherapist, but soon got tired. The amendment was inserted (hand written) just below the nurse report:

The patient did not accept the instructions as well as yesterday, but managed to get up and sit down satisfactorily. He walked one round in the walkway. There did not appear to be any pain beyond the pain in the thighs and knees (Physiotherapist)

In contrast to the reports, the nursing plan is a distinct tool for the nursing staff, which excludes the participation of physicians and psychologists. The nursing plan was focused purely on nursing work:

Previously, we have been very concerned about mediating what the physician has prescribed, the results of tests, diagnoses, etc, but nothing about how to approach an anxious patient (...) Alternatively, if we make a good nursing plan, we will see the patients' problem from the perspective of the nursing staff (Project group nurse)

The physicians shared the same understanding. One of them commented:

In the same way as the nurses don't involve themselves in what kind of medications is given (except antidepressants and antipsychotic medication), the nursing plan is primarily used by the nurses (Physician)

As the plan failed to support interdisciplinary work, it might also block the communication between the nursing staff and the patients, which was an important feature of the plans in another ward at the department (the Security ward). In this ward, a nursing plan functioned as a contract between the staff and a patient. Along similar lines, a head nurse from one of the somatic departments told at the head nurse meeting:

We produce documentation together with the patients, and we translate between ourselves and the patients (...) but the patients haven't got a language suited to classification schemes. The question then becomes how to deal with this in the future (Head nurse, from another department)

## Conclusion and implications

In this paper, we have illustrated how interdisciplinary work may be seen as a heterogeneous network of people, technologies and practices. Within such an ensemble, different professionals follow different courses and aims with only temporal intersection points with the other professions. We have also underscored how the old reports and the oral communication in the meetings became even more important than before, serving as a foundation for the nursing plan. Finally, we have pointed out how the physicians and the psychologists experienced that the value of the new plan was lower than that of the old reports.

Based on this we draw the following conclusions. Firstly, we should dismiss a common or a shared perspective of what integrated care is. Theoretically, we have indicated how the notion of integrated care has blurry definitions. This study takes this further as it illustrates that even in work settings fully dedicated to interdisciplinary work/integrated care, the different professionals do not share a common apprehension of the patient case and the patient's problem. In fact, this occurs only in brief moments and only if it is regarded as adding value to a given professional perspective. Accordingly, when using the notion of integrated care, we should be careful not to refer to it as an absolute entity, but rather take into account what perspective is involved and who is promoting it.

Secondly, and following from the first one: A given implementation of an infrastructural arrangement for integrated care will inevitably privilege one of the professional groups involved, making its perspective more visible and explicit (for example, nursing was made explicit through the nursing plan). We do not, however, intend this to imply that IT systems dedicated to a particular profession are isolated from the broader

practice. As demonstrated in this study, physicians and psychologists used the nursing reports when producing their own reports.

Thirdly, we should neither depend on simplistic strategies of *replacing* most of the existing information sources at play in a work practice, nor regard new systems in isolation. Rather we suggest conceptualising infrastructural arrangements as a loosely coupled heterogeneous network of nodes made up of different IT systems such as physician's notes, paper forms, nursing plans, and oral accounts. The strategy for implementing new IT systems (such as the nursing plan) should then be to integrate them into the existing network, making sure to establish a robust connection between the existing nodes.

Fourthly, the interconnected, and mutually dependent, nodes of infrastructural arrangements, practices and different professionals underscore the need for doing empirical studies in a work setting by following the whole process of implementing a new system (before, during and after). Such studies may reveal both explicit and implicit dependencies which must be taken into account. They may also indicate how, and to what degree, a new system is used as this may not be entirely clear to the users themselves. In the current study, the nursing plan was basically used as a formal tool, and only for a small part of their practice. The current study shed light on how the old informal information sources were in fact heavily used in practice, serving as a foundation for the nursing plan.

## Reviewers

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