An ethnographic study comparing approaches to inter-professional knowledge sharing and learning in discharge planning and care transitions

Abstract

Purpose: This paper investigates how three communication interventions commonly used during discharge planning and care transitions enable inter-professional knowledge sharing and learning as a foundation for more integrated working. These interventions include: information communication systems, dedicated discharge planning roles, and group-based planning activities.

Design: A two-year ethnographic study carried out across two regional health and care systems in the English National Health Service, focusing on the discharge of stroke and hip fracture patients. Data collection involved in-depth observations and 213 semi-structured interviews.

Findings: Information systems (e.g. e-records) represent a relatively stable conduit for the routine and standardised forms of syntactic information exchange that can 'bridge' time-space knowledge boundaries. Specialist discharge roles (e.g. discharge coordinators) support personalised and dynamic forms of 'semantic' knowledge sharing that can 'broker' epistemic and cultural boundaries. Group-based activities (e.g. team meetings) provide a basis for more direct 'pragmatic' knowledge translation that can support inter-professional 'bonding' at the cultural and organisational level, but where inclusion factors complicate exchange.

Research Implications: The study offers analysis of how professional boundaries complicate discharge planning and care transition, and the potential for different communication interventions to support knowledge sharing and learning.

Originality: The paper builds upon existing research on inter-professional collaboration and patient safety by focusing on the problems of communication and coordination in the context of discharge planning and care transitions. It suggests that care systems should look to develop multiple complementary approaches to inter-professional communication that offer opportunities for dynamic knowledge sharing and learning.

Background

The transition of care from hospital to community is widely regarded as a vulnerable 'pinch-point' in the patient journey (Aase et al. 2017). Growing demand for urgent care at the hospital 'front door' creates pressure at the 'backdoor' to discharge patients; but a lack of integration with community health and social care sectors often makes the timely and safe transition of care difficult to realise (Coleman et al. 2004). In the UK, there has been mounting attention to the breakdowns in care that lead to patients being sent home too early or without the necessary care to support recovery (Healthwatch 2015). International research suggests that as many as twenty percent of patients experience sub-optimal or unsafe care during or after discharge, resulting in prolonged recovery, re-admission and long-term harm (Aase et el. 2017; Coleman et al. 2004; Enderlin et al. 2013; Kansagara et al. 2016; Morris et al. 2018). The safety challenges presented by hospital discharge illustrate the inherent complexities of modern care systems, in which multiple heterogenous professionals are engaged in myriad non-linear

interactions giving rise to unanticipated outcomes (Braithwaite et al. 2018). This calls for attention to the relationships *between* care settings and providers, but to date, patient safety research has been predominately concerned with risks located *within* care settings.

Research on hospital discharge consistently shows that 'breakdowns' in the communication and coordination between health and social care professionals can be a threat to quality and safety (Aase et al. 2017; Coleman and Berenson 2004; Glasby 2000; Kripalani et al 2007; O'Hara et al. 2018, Hesselink et al. 2012, Waring et al. 2016). Health policies and research recommend a variety of interventions to improve the accuracy, timing and effectiveness of inter-professional communication, including dedicated information communication technologies, checklists, planning roles, and group decision-making activities (Coleman and Boult 2003; Heskestad and Aase 2017; Gittel and Weiss 2004). Although such interventions have been subject to various forms of appraisal, few studies have considered the combined or aggregate contribution of such communication interventions in the context of more everyday 'shop-floor' interactions (Prætorius 2018). More significantly, there is limited evidence as to how such interventions move beyond supporting communication around the discharge of individual patients, to engendering more sustained inter-professional learning and coordination that might mitigate the complexity of the care system.

This paper reports on an ethnographic study within the English healthcare system that analysed and compared the organisation and operation of three widely used interventions to facilitate inter-professional communication and coordination in discharge planning and care transition (Gittell and Weiss 2004). These include: information communication technologies, discharge coordinator roles, and multi-disciplinary care planning meetings. The study is framed by two social science perspectives that together improve understanding of how such

interventions can contribute to sustained inter-professional learning and coordination. The first perspective highlights the influence of professional boundaries in the social organisation of health and care services, which are consistently identified as a major complicating factor to integrated or coordinated working (e.g. Cregard 2018; Nancarrow and Borthwick 2005). The second perspective presents the concept of knowledge sharing, which offers an approach to thinking about inter-professional communication that considers how the sharing of knowledge can lead to more sustained forms of learning and enduring solutions to system complexity (e.g. Currie et al. 2007). Drawing together these perspectives, the study examines how different approaches to discharge planning support (or hinder) inter-professional knowledge sharing and whether this leads to more enduring patterns of mutual learning and coordination (author).

Professional Boundaries and Hospital Discharge

The social organisation of health and care systems is characterised by well-developed professional boundaries, such as between doctors, nurses, occupational therapists and social workers (Apesoa-Varano 2013; Martin et al. 2007; Nancarrow and Borthwick 2005). Lamont and Molnar (2002) suggest 'symbolic' boundaries are conceptual distinctions used by social groups to differentiate people, places and practices, and that particular resources and strategies are used to create, maintain and contestthese boundaries – or boundary work (Gieryn 1983). Following Abbott (1988), professions can be interpreted as occupations that have successfully established a specialist jurisdiction or boundary within the eco-system of expert labour. These jurisdictions demarcate exclusive areas of work, usually premised on an occupation's perceived

legitimacy over the diagnosis and remedy certain problems based upon their expert knowledge. Professional boundaries are not fixed or impermeable, rather they are the sites for negotiation and conflict as occupations 'work out' their functional relationships on a day-by-day basis (Allen 1997, 2000). The study of professional boundaries, in health care and beyond, foregrounds questions of social power and influence (Abbott 1988).

Professional boundaries are consistently shown to influence, even inhibit, inter-professional working in health and care services (Korner et al, 2016; Liberati et al. 2016). The influence of professional boundaries can be seen, for example, in the way health care services have traditionally been organised around professional specialities, with episodes of care provided within one jurisdiction before being transferred to another (Lewis 2001). Within the hospital this is exemplified by the persistence of hospital departments and wards aligned with (usually) medical jurisdictions. Cregard (2018) shows how the relationship between inter-professional coordination and boundaries can be complex. For example, 'closed' boundaries do not always result in an absence of coordination, rather more inefficient interactions; whilst 'open' boundaries do not necessarily promote coordination, especially if power inequalities exist across boundaries.

Over the last two decades, policies to introduce more integrated and patient-centred services have, in various ways, sought to re-draw professional boundaries through the re-allocation of specialist tasks and the promotion of inter-professional teamwork (Glasby 2017). Nancarrow and Borthwick (2005) describe how such reforms have led high-status professions to become increasingly specialised around narrower silos of expertise, with the delegation of less specialised tasks to lower status occupations who are expected to work in more complementary or blurred ways. Research further shows that boundary changes are often difficult, especially

where professionals resist changes that are perceived as threatening their jurisdiction (Martin et al. 2009). As such, the effects of managerial attempts to diminish professional boundaries are far from uniform, and the underlying dynamics of professional status and power continues to shape the social organisation of care.

Of relevance to our study, professional boundaries are shown to have complicating effects on inter-professional communication and coordination during discharge planning and care transitions (Glasby 2000). These are manifest in multiple, overlapping ways. The boundaries between hospital clinicians, e.g. doctors, nurses and therapists, can influence decision-making when determining a patient's readiness for discharge and continuing care needs (Waring et al. 2015). The boundaries between hospital clinicians and community-based care providers, e.g. general practitioners, community nurses and social workers, can influence the formulation and delivery of care plans before, during and after the point of transition (Kripalani et al. 2007). And the boundaries between community-based health and social care providers can influence the continuity of care when returned to the community setting (Glasby 2000). In their analysis of these inter-professional interactions, Waring et al. (2013) elaborate these professional boundaries in four overlapping ways. The first relates to 'epistemic' boundaries that demarcate distinct areas of expertise around which professional jurisdictions are organised. The second relates to 'cultural' boundaries within which shared beliefs, values, and norms provide a basis of group identification and coherence. The third relates to 'organising' boundaries or the shared and customary ways of configuring, resources and coordinating work. And the fourth relates to 'political' boundaries, or the divergent interests and agenda that implicitly shape the organisation and culture of professional practice, and are seen in the relative status, influence or power of professions. In the context of hospital discharge, Waring et al. (2013) suggest that the mismatch between health and social care professionals can be explained, in part, by the

boundaries between how professional know the patient, value professional input, organise day-to-day care, and seek to influence the work of others.

Policies to improve inter-professional working during discharge planning and care transition often focus on the importance of improving inter-professional communication and coordination (Audit Commission 2000; Healthwatch 2015). This has involved the development of various communication interventions that, according to Gittell and Weiss (2004), can be summarised along four lines: i) standardised procedures and checklists that structure the content of communication (Coleman and Boult 2003; Parry et al. 2003); ii) group meetings that enable communication and shared decision-making (Heskestad and Aase 2017); iii) information systems that enable the standardised collection and communication of information, from more commonplace forms of note-taking and telephones, to dedicated computer systems such as email (Gittell and Weiss 2004); and iv) boundary spanning roles that work within and between boundaries to facilitate communication and coordination (Williams 2002). In different ways, such interventions address the communication problems typically encountered during hospital discharge by enabling the collection, transfer and application of information located within different professional silos. As an illustrative comparison, discharge checklists gather standardised information from within the hospital setting about the patient's condition and proposed care plans to support the continuity of care in the community; whereas discharge coordinators are tasked with supporting the development of individualised care plans by communicating with and coordinating the involvement of multiple care professionals.

It is noteworthy, however, that the promotion of such interventions in research and policy are premised on a technical-functional view of service organisation and rarely gives detailed consideration to the character of professional boundaries that complicate hospital discharge.

There is limited appreciation, for example, of the relationships between expertise, jurisdiction and status; and how these complicate the willingness of professionals to communicate and coordinate across boundaries. Returning to Abbott (1988), this problem can be seen as rooted in the way professional jurisdictions are premised on claims to exclusive expertise, and where the sharing of specialist information with 'outsiders' might threaten professional jurisdiction. This phenomenon can be seen with the introduction of quality improvement interventions where professional boundaries are shown to stymie knowledge sharing and in term inhibit learning and innovation (Author; Powell and Davies 2012). Reflecting further on the experiences of quality improvement, the failure to give more thorough consideration to the character of professional boundaries, and the types of knowledge that professionals might share across these boundaries, also means that policies do not fully consider the potential for such interventions to contribute to more sustained forms of inter-professional learning and coordination

In developing this view, we make a number of preliminary distinctions. The first is between the concepts of 'communication' and 'knowledge sharing'. Where the former might be seen as concerned with the dissemination or exchange of 'information' around a given task or activity, the latter is concerned with the exchange, use and assimilation of more situated 'know-how' as a basis of mutual learning and innovation. Following this, the second distinction recognises a difference between more explicit or 'codified' information and more implicit or tacit 'know-how' (Polanyi 2009). Although both forms of knowledge are integral to day-to-day working, learning and innovation is more often associated with the sharing of taken-for-granted meanings, assumptions and beliefs in the course of situated interaction (Nicolini 2013).

The relationship between knowledge, boundaries, and learning is elaborated in Carlile's (2004) work on knowledge transfer and innovation. This recognises that the knowledge boundaries between organisations and occupations can be understood in terms of their 'difference' and 'dependencies'. 'Difference' relates to both the different forms of, and needs for, knowledge a particular group holds, such as the extent of expertise around a given problem; whilst the latter relates to the extent to which the knowledge of another group is needed to address a given problem. He suggests that where the differences between groups are relatively small, and the dependencies are agreed upon, the more knowledge exchange can be standardised through forms of 'syntactic' knowledge 'transfer' involving, for example, a common language or share information systems. These enable the relatively seamless flow of explicit information across boundaries. Where the differences are more significant around changeable dependencies, there is need for 'semantic' meanings, beliefs and taken-for-granted assumptions to be 'translated' across knowledge boundaries. This often involves actors who 'broker' or mediate between communities to develop and share insight and understanding of the cultures of other social groups. Where the differences and dependencies between groups are shaped by divergent political interests that impede knowledge exchange, then it becomes important to foster more pragmatic knowledge exchange through transforming or blurring divergent interests into a common agenda and interests around a shared problem. This transformation is situated in the integrative and negotiated practices of actors as they work through their differences leading to shared cultures, ways of working and political priorities.

These ideas offer a framework for analysing how different communication interventions not only support discharge planning and care transition around individual patients, but also engender more substantial forms of inter-professional knowledge sharing and learning as a basis of coordination working. Following Carlile (2004), for example, it might be anticipated

that certain interventions might lend themselves to more syntactic boundaries, whereas others offer scope for more pragmatic transformation. What is less understood, however, is the interplay between these different interventions and how they might combine to offer a basis of knowledge sharing and learning across professional boundaries.

Study Method

Study settings and communication interventions

The research was carried out in two 'care systems' within the English National Health Service. The term 'care system' describes the configuration of health and social care services within a locality (county or metropolitan area), including primary, secondary and community health services, and corresponding social care services, including statutory agencies, private providers or third sector. Attention to the care 'system' (rather than hospital) was necessary to understand how discharge planning and care transition is realised across these settings involving multiple professional groups. Two care systems were selected to allow for in-depth and comparative data collection, including differences in number, size and profile of hospitals and configuration of community health and social care (Table 1). Within these systems, the research focused on the discharge of orthopaedic hip fracture and stroke patients. These were selected on the basis of being a major source of demand and complexity because they tend to be older patients with multi-morbidities and complex health and social care needs. It is recognised that significant changes have occurred in the organisation of hyper-acute stroke care, including the development of regional specialist centres (Morris et al. 2014). It might be expected these changes will also alter the organisation of stroke discharge, although many important factors

affecting discharge are located outside the specialist hospital, dispersed across the wider system, and hence might still be influencing care services.

<Insert Table 1>

Our ethnographic study found that the orthopaedic and stroke services within these two care systems used a variety of common communication tools and interventions to support discharge planning and care transitions. In the preliminary stages of data analysis, we categorised these interventions following Gittell and Weiss (2004): i) information communication technologies; ii) dedicated roles; and iii) group activities. What was more significant was the variable use of these interventions across the two care systems and clinical services areas (Table 2). These variations reflected local contextual factors, such as management priorities, staffing requirements and historical patterns of health and social care integration. For the purpose of this study, such variations allowed for comparative case analysis of the relative contributions of each intervention type as well as the aggregate contribution in different combinations. As out ethnographic study progressed, we focused on-going data collection and analysis on how these interventions, especially in combination, allow for inter-professional knowledge sharing and learning.

<Insert Table 2>

Design and Data Collection

The data reported in this article were collected as part of an ethnographic study of the social organisation of hospital discharge. The primary focus of this ethnographic study was the

influence of professional boundaries on discharge processes. Through the preliminary stages of data collection, our focus narrowed onto a number of empirically induced issues, one of which was to understand the relative contribution of different interventions to inter-professional knowledge sharing and learning. A range of other themes were developed from the extensive body of empirical data which are not reported in this paper (authors).

The ethnographic study was carried out over 24 months from mid-2011 to mid-2013 with data collection carried out in each hospital setting for 7 months with a further 3 months in the corresponding community setting. Observations aimed to understand how discharge planning and care transition occurred over time and in different care settings. Observations commenced in the stroke and orthopaedic wards of each hospital (for about 3-4 months) where it was found that elements of early discharge planning started at the point of admission, but more detailed and focused activities occurred after the patient was regarded as stable and well enough to return home. Following the broad pathway, our observations moved from the hospital setting to the community, including community hospitals, rehabilitation centres, care home and patients' homes. The fieldwork strategy aimed to progressively deepen understanding of discharge processes through: i) observations of everyday care activities to 'map-out' discharge planning in each ward setting; ii) focused observations of key tasks, interactions and situations identified as integral to the discharge process; iii) shadowing of key individuals involved in discharge processes; and iv) following the discharge of individual patients. As part of these observations, many in-situ conversation-style interviews took place with healthcare professionals, patients and relatives to clarify observations. Three of the authors carried out the field work each recorded their observations and interpretations in hand-written journals, with electronic summary reports typed-up and shared with all researchers to inform on-going reflection and analysis.

Semi-structured interviews were carried out with 213 individuals across the study sites, and a small number of individuals (5-10) participated in follow-up interviews to clarify our findings. Participants were identified on the basis of observed involvement in hospital discharge, and were usually recruited to interview whilst researchers were carrying out ethnographic observations, or through working with service leaders to identify staff group representatives. Selection sought to achieve representation and diversity across occupational groups (Table 2). In addition, seven focus groups were carried out with staff representatives not involved in interview: including community rehabilitation nurses (n12), stroke therapists (n11), orthopaedic nurses (n6), stroke nurses (n15), GP and primary care commissioners (n7, n4); and Ambulance Service representatives (n3).

Interviews were broadly structured to explore participants' understandings of discharge planning and care transition. We did not use a standardised interview topic guide with all participants, rather the focus of interview questions were altered over time in light of emerging findings, and varied according to the particular individual being interviews. For example, earlier interviews with hospital doctors explored slightly different issues than later interviews with community social care providers. The common interview topics included: career background and role; experiences and perceptions of discharge process; understanding of communication and coordinating issues in discharge process; views about the risks and problems associated with discharge; and also, views about the relative contribution of different discharge interventions. Interviews rand focus groups ranged in length from 30 to 90 minutes.

All interview participants gave written consent to be interviewed, and all interviews were recorded and transcribed verbatim.

<Insert Table 3>

The study received favourable ethical opinion through standard NHS research governance procedures. Information booklets, posters and staff briefing sessions were provided at all study sites prior to data collection. In advanced of carrying out observations in different organisational settings, e.g. in meetings or on wards, verbal consent was sought from those present. Where data collection involved direct observations of individual or group interactions, and where individuals were involved in interviews, additional written informed consent was provided.

Data Analysis

Data analysis followed in the ethnographic tradition of developing rich empirical descriptions and inductive interpretations of social processes (Fetterman 1990). Taking a grounded approach, we started analysis from the point of commencing data collection, including individual and group reflections of emerging findings and themes; identification and selection of observations and interview participants based on on-going analysis; and continuous processes of coding and categorisation (Corbin and Strauss 1990). As noted above, our initial focus was on the broad social organisation of hospital discharge, but through the early stages of data analysis we focused our enquiries including attention to the contribution of different interventions to support inter-professional communication. At this stage, the research literature

on communication interventions and knowledge boundaries was reviewed (e.g. Carlile 2004; Gittell and Weiss 2004) to sensitise our on-going data collection.

In practical terms, interpretative qualitative data analysis was undertaken to develop descriptive accounts and interpretations of discharge planning and care transition (Corbin and Strauss 1990). This involved an iterative process of open coding, constant comparison, elaboration of themes and re-engaging with wider literature. All authors were responsible for preliminary coding using the computer package nVivo (v.10), with weekly meetings to discuss individual reflections and review the consistency of coding. Inductive analysis developed descriptive accounts of discharge processes, attending to the configuration and contribution of different interventions (Gittell and Weiss 2004). In reviewing and extending our inductive categories and themes, we further engaged with Carlile's (2004) framework to help us make sense of explain the relatively contribution of each intervention to discharge process. In particular, data analysis focused on how different approaches to discharge planning support inter-professional knowledge sharing and learning. This included analysis of the cumulative benefits of different approaches to discharge planning.

Findings

Although the preliminary aspects of discharge planning can commence at the point of admission to hospital, our observations found that the main work of discharge tended to occur across five common stages later in the care pathway: i) determining readiness for discharge, including completion of hospital care prior to discharge; ii) assessing and planning on-going post-discharge care; iii) determining the settings and resources for post-discharge care; iv)

managing care transition and re-settlement; and v) initiating on-going care and rehabilitation in the community. Our observations found that three common types of intervention were used to facilitate inter-professional communication and coordination across these stages (Table 2).

Technologies

A large number of information communication technologies were used routinely across the patient pathway, with many having an important role in discharge planning and care transition. We use the term information communication technology to refer to any form of technology involved in the communication of information. This ranged from paper and pen to digital computer technologies, and as elaborated below, these tended to focus on the exchange of explicit forms of information. These technologies ranged in purpose, from care management and coordination (main patient record) to specific technologies used to support discharge planning (discharge progress checklists). They varied in form, from paper-based records and notes, to electronic communication systems, such as an e-discharge communication system. Many participants noted the rapid growth in digital technologies that added to, rather than replaced older systems, and contributed to more complex patterns of communication, often to the detriment of direct patient communication. Many established record systems were tailored to the needs of individual professionals, for example occupational therapists kept a dedicated record to support discharge planning, with inter-professional communication often involving 'reading-off' paper records during group meetings. Of note, two wards used a 'Shared Discharge Record' that collated multiple sources of information related to discharge planning and on-going care, parts of which were shared with external agencies at the point of discharge. In addition, each study site used a variety of other specialist systems for specific tasks within the discharge process, such as social work referral notifications, ordering 'To Take Out'

medicines (TTOs) or transportation booking systems. It was also found that telephones and fax machines continued to have a significant role in supporting communication where new digital systems were not established.

In different ways, all of these technologies supported information communication (but not necessarily knowledge sharing) during hospital discharge. All enabled the recording and sharing of primarily codified information, usually directed by template forms and standardised questions. Electronic systems were increasingly adopted with the declared intent of improving accuracy and ease of information capture and exchange. In a number of instances, the use of electronic communications systems was supported through preliminary or parallel use of paper-based records or verbal communications, for example the electronic ordering of TTOs would often first be recorded by hand in the patient record, or ordering home adaptions through an online booking systems regularly required telephone conversations to query items. As such, electronic technologies did not offer the panacea many assumed.

> "We still use fax. Can you believe it. Fax. Mostly when sending referrals to social services. It seems too old fashioned" [Ward Clerk, S2, Orthopaedic]

> "I still pick up the phone and call through the referral centre. Its rare to actually speak to a social worker but at least you get to log the referral with someone before you then send through the forms" [Nurse, S1, Stroke]

The multiplicity of technological systems not only necessitated duplication of recording due to a lack of inter-operability, but also problems of coordination between systems that needed additional work to be resolved during day-to-day practice. For example, communication with

care homes, GPs and equipment supplies would typically require three separate IT systems, with additional information exchange via email or telephone conversations. As such, professionals needed to work-out which systems to use on a case-by-case basis, with little indication of common solutions being developed

> "it's electronic now, all on the system and the idea is that for all of the GPs in the area *will be* [emphasis added] connected to the discharge summary." [Ward Clerk, S2 Stroke]

> "There isn't a simple answer. There are just too many agencies out there, and each has their own system, and you have to know what they each need, and when they need it" [Nurse, S2, Orthopaedic]

In contrast, paper-based records seemed to act as a more dynamic and evolving record that appeared to be 'owned' by a professional group or team. These had more material and tangible qualities that could both exchange explicit information, but also act as a medium for inter-professional dialogue whether at the patient's bedside or in meetings. Such mediated inter-professional exchange was difficult through remote electronic systems, i.e. professionals would refer to and discuss written records during shared decision-making. In team meetings, for example, patient records and discharge tools acted as an organising device for discussion and decision-making where clinicians would question the meaning or implications of information leading to more layered inter-professional exchange.

> "It might seem antiquated but with a patient file you can pick it up and give it to someone…when everything fails you can put the summary on the trolley with the patient as they get wheeled out" [Nurse, S2, Orthopaedic]

Roles

A number of dedicated professional roles supported discharge planning, including Discharge/Care Coordinators, Community In-reach workers, and Discharge Liaison Teams. In different ways, these took responsibility for: i) determining and allocating care needs before and after discharge; ii) sequencing and coordinating tasks for care transition, such as outstanding tests; iii) facilitating communication across hospital and community teams; iv) working with external agencies to arrange on-going care, e.g. social work; and v) managing documentation and care plans. Other professionals fulfilled similar functions, but these tended to be more narrowly task-based when compared with these coordinating roles, i.e. social workers would lead on social care assessments.

Discharge Coordinators had the most active role in discharge planning, working with clinicians on the hospital ward to support progression towards discharge and liaising with community services to plan for on-going care. In one study site, a Discharge Liaison Team had a similar role, but was reserved for patients with especially complex needs or personal circumstances. Community in-reach workers fulfilled similar planning roles, but with greater emphasis on supporting the continuity of care once transferred to the community. These were employed by community health providers to work on the hospital wards to pre-plan and initiate care prior to discharge.

These boundary spanning roles (Williams 2002) were involved in high levels of multi-directed knowledge sharing across semantic and pragmatic boundaries (Carlile 2004). This involved: i) gathering knowledge from different specialists; ii) translating knowledge into a form relevant to others; iii) sharing knowledge with others at the right time; and iv) helping others to integrate knowledge into their own practice. This included codified patient information, such translating test results for non-specialist audiences, and more tacit assumptions about, for instance, scheduling discharge in the context of resource constraints.

> "The discharge co-ordinator will know exactly where [patients] are in that process.… And okay it doesn't change where [the patient] is but at least we know where it is in the process and that doesn't always happen when you haven't got a discharge co-ordinator… because their whole job is to try and push the patients through, clearly they have to move or they aren't in that process. [Medical, S1 Orthopeadic]

> "And I think one of my main contacts is the discharge specialist sister, she tends to sort out any issues that I've got. I've developed quite a relationship with her, so she'll often help me out". [Community Nurse, S2 Stroke]

These coordinators and in-reach workers had many personal contacts across professional boundaries that enabled them to better appreciate the different working routines whilst enabling to develop a strong sense of reciprocity and mutuality. This could be seen, for example, when working with Social Workers to discuss discharge arrangements, or with Occupational Therapists to plan on-going rehabilitation. In such instances, their personal connections and detailed understanding of specialist roles and routines enhanced the flow of more tacit know-

how, fostering shared understanding at key contact points across the care system. This included 'soft intelligence' (Martin et al. 2015) about the current state of community services that might not be officially documented. They also mediated interactions between health and social care professionals during times of disagreement, and more commonly acted as problem-solvers when navigating the idiosyncrasies of the care system. Through working across professional boundaries role-holders acquired a form of 'architectural' knowledge of the care system, i.e. how the various services should (or could be made to) fit together to facilitate discharge.

Group Activities

The organisation of patient care involves many inter-professional group activities, three of which provided the main sites for discharge planning: i) daily ward rounds; ii) daily board rounds; and iii) weekly multi-disciplinary team (MDT) meetings. These activities varied in purpose, scheduling, number and variety of participants, and patterns of communication; all of which shaped the opportunities for and quality of knowledge sharing.

Ward rounds were used to review and allocate daily tasks to progress patient care. These were led by the medical team and organised around the patient bedside, with tasks usually allocated to junior doctors and nursing staff. A key decision-making issue was whether the patient was (or remained) medically 'fit' for discharge, with a primary focus on their physical condition and recovery from the perspective of the medical team. Communication focused on the clinical tasks needed to progress the patient towards discharge, often taking the form of 'question-and-answer' interactions between medical staff and patients, junior doctors or nurses. These

interactions involve the syntactic and semantic knowledge exchange, from codified test results to professional reflection, with a view to addressing short term care plans.

> The doctors do the ward round. The doctors will then say, 'Well as far as we're concerned, this patient is medically fit'. If OT and physio and speech and language are happy, then they can be discharged. Then it's our job to find out from them and then if there's a problem, then we take it from there". [Sister, S1 Stroke]

In three sites, Board Rounds were organised away from the patient bedside as a more detailed review of daily care and discharge planning. These involved a comprehensive review of the outstanding care needs of all admitted patients, usually led by a senior ward nurse with representatives of other ward-based professionals, e.g. dieticians, occupational therapists and junior doctors. These usually followed-up on the decisions reached during the medical ward round, but with more attention to the broader and outstanding care needs for each patient. In practice, inter-professional communication was mediated via a whiteboard on which core patient information was recorded together with a list of outstanding tasks and an 'estimated date of discharge'. Although focused on daily care planning, board rounds took a slightly longer-term view of care planning. Significant, was the frequent involvement of ward managers in Board Rounds who tended to emphasise the need to prioritise and expedite discharge to '*free-up beds*'. The pressure to progress discharge and move-on patients appear to encourage professionals to hurry discharge processes; compressing the time for problem-centred knowledge sharing and collaboration amongst different professional groups.

> "…it's about seeing who's appropriate to maybe go home from the unit. It might be that day, we might think in a couple of days time they can go home, so it's about

screening…. So once we've prioritised it's then going through an assessment, which for some patients can be very quick and very straightforward, you can get to grips with them quite quickly". [OT, S2 Stroke]

"The board round give us a snapshot of who is coming in and who can go out. It helps with focusing attention and getting the care plans moving" [Manager, S1, Stroke]

Like ward rounds, knowledge sharing took both explicit and implicit forms, but with more active involvement and more open discussion about how inter-connected tasks can be scheduled. Where open discussion was encouraged by senior staff it seemed to support a common *ward-based* understanding of discharge processes, for example, where ward nurses made additional time for occupational therapists to work with patients, or where dietician scheduled their work to coincide with family visitors to allow relatives to understanding on-going care needs. Where Board Rounds were not used, or where they were tightly controlled to manage bed-flow, knowledge sharing was more task-focused with less scope to allow for mutual coordination and learning. Due to the time at which both ward and board rounds were scheduled, it was rare for community-based professionals to attend, and therefore aspects of on-going care were rarely discussed.

All research sites utilised weekly multi-disciplinary team meetings (MDTs) to review individual care plans. Given the length of time from admission to discharge, most were reviewed at least two MDTs. The decision to initiate discharge planning was usually reached or confirmed here. In three sites, a core group of hospital professionals, including representatives of the medical team, ward nurses, occupational- and physio- therapists, dieticians, speech and language therapists, and ward-based pharmacists participated in the

MDTs. The focus of the meetings was not exclusively discharge planning, rather overall case management, but discharge remained a priority from the point of admission. In two sites, social work and community nursing representatives were actively invited to attend weekly meetings to inform on-going care planning.

MDTs provided an opportunity for knowledge sharing that not only enabled care planning based on sharing of specialist knowledge, but also a platform for more collaborative working based upon professionals acquiring a better understanding of the contribution of others in the organisation of care. Although the MDTs had common features, each had local routines and recording practices. It was common, for example, that during the MDTs each professional representative offered specialist insight into patient care needs, which contributed to the specification of medium-term and longer-term care planning. The open exchange of information seemed especially useful for social work representatives who could better understand the workflow and demands on the wards, whilst also sharing information about resource availability in the community. This could lead to the decision, for example to extend ward-based rehabilitation because of limited services in the community.

> "I think between us we've got a broad enough experience of complex discharge to actually know what we're doing and it's very rare we sort of come up against something. So we all head-scratch and what have you. And then again within the MDT as well try and discuss anything and brainstorm it and take it from there". [Nurse, S1, Stroke]

> "I've learned so much about medication and continence things that I didn't realise before. So it's you know, you can take that with you and think a little bit more about

discharges. And just when you think of a discharge, when I was doing discharges before you would look at the OT bits whereas now, I look at things holistically". [Physio S1, Orthopaedic]

In one site (S2, Orthopaedic) MDTs were primarily focused on medical and nursing care, and other professional representatives rarely attended or participated in decision-making. It was further observed that these MDTs rarely considered discharge planning being concerned instead with pre- and post-surgical care. It was expected that discharge would be managed during day-to-day ward care, and not in group meetings. This limited opportunities for overarching care planning with ward staff working towards care plans that varied on a daily or shift basis.

"To be honest the surgical teams don't get hugely involved with discharge. All they will do is what they think is necessary following surgery and the patient is generally fit. They'll just say discharge planning and then they don't get too involved." [Medical, S2 orthopaedic]

"We don't get involved in the weekly MDT, we usually have to wait to hear from the nurse-in-charge, or try and work out the care plan through reviewing the records" [OT, S2, orthopaedic]

Discussion

The technologies, roles and group activities observed in our ethnographic study are widespread features to most developed care systems and have, individually, been the subject of previous research. However, few studies have compared or examined the interaction of these approaches, nor their contributions to inter-professional knowledge sharing and learning. Our findings suggest each affords opportunities for knowledge sharing and learning, but often with limits. It also suggests that the cumulative effect of these approaches, where appropriately aligned might best support discharge planning and care transition.

Information systems represent a relatively stable and routine conduit for information exchange across synaptic professional boundaries (Carlile 2004). Across all sites they took various forms, from pens and paper to specific online software, and were broadly characterised by the recording, storage and transfer of explicit or codified information, often in the form of prescribed reporting standards developed with reference to the work of professional groups working in a given care setting, e.g. on the ward or in the community. They also ranged in application from being broad information resources for general care planning to facilitating specific tasks within the processes of hospital discharge, e.g. ordering home adaptions. In many instances these technological systems often seemed to be concerned with spanning particular spatial and temporary boundaries, in that they enable indirect or impersonal knowledge exchange mediated through third-party technologies. These systems might be interpreted as more rigid or fixed 'bridges' between professional communities that enable the relatively seamless and streamlines flow of standardised information between disconnected communities.

As a medium for exchanging information across syntactic boundaries there is arguably an assumption that those using these technologies share some common language or lexicon around

the processes and goal of discharge planning. It was observed, however, that in many instances those using these technologies did not share this common language, and struggled with technological competence, necessitating the use of parallel or additional communication channels. In particular, the emergence of novel conditions could result in an existing technological systems no longer being sufficient to process information at the boundary. This could be seen when actors become involved in care planning who were unconnected to the established NHS technological systems or 'bridges', such as care homes. More significant, however, because such systems are largely concerned with the collection and transfer of explicit information they are limited in their capacity to engender semantic or pragmatic knowledge transfer. As Cook and Brown (1999) note, explicit knowledge alone cannot support all the required epistemic work for the creation of new knowledge. Thus, information systems in isolation offer little opportunity for knowledge sharing and mutual learning and perform, at best, as an underlying basis for information exchange. It is noteworthy that such systems require significant resource and time investment in set-up and administration and result in multiple instances of duplication and additional work. As suggested above, when new ICT are poorly coordinated or embedded with the realities of the workplace they do not offer the communication revolution so many policies assume.

In contrast, discharge coordinators and in-reach workers represent a more dynamic approach to knowledge sharing during hospital discharge. These roles operated both within and across professional boundaries, and importantly, supported the transfer of tacit know-how amongst diverse communities based upon their direct or first-hand experience of working within and across the distinct epistemic, cultural and organisational boundaries (Waring et al. 2013). Within the wider social science literature, these roles might be interpreted as 'boundary spanners' (Williams 2002) because of their ability to work across and understand the

differences and similarities between professional communities. In particular, they acted as knowledge brokers (Meyer 2010, Ward et al. 2012), using their exposure to different professional communities to understand, interpret and translate the tacit know-how of one group, and through the processes of translation and communication they enable other groups to better understand and accommodate this knowledge in their own distinct practices. As such, they had a key role in supporting knowledge translation across the semantic boundaries (Carlile 2004), especially in the processes of problem-solving. Although discharge coordinators often presented themselves as focusing on the care plans of individual patients, their contribution to hospital discharge was found in their potential to enhance broader patterns of inter-professional communication through facilitating knowledge sharing and mutual learning. In part, this was enabled by these actors having acquired a developed 'architectural' understanding of the local care system, including how 'component' specialists could be better coordinated (Currie and White 2012; Henderson and Clark 1990). These qualities suggest that, unlike 'bridging' information systems, role-based brokers illustrate a more dynamic 'broker' or 'boat' that has both multiple entry and exit points into different communities, and is capable of bring together different specialist around a specific issue.

Such roles were not without complications or risk. Comparison of these role-holders in the different study sites suggests that their individual social position and social capital can influence how these roles are enacted. This often focused on the relative experience and standing of the role-holder, not only within their own profession, but with those other groups they interact with; which appeared to determine the extent of 'access' and 'exposure' to the knowledge, culture and working practices of these other groups (Currie and White 2012). Furthermore, over-reliance upon these role-holders could reduce the need for other professional actors to develop similar connections and expertise in discharge planning, potentially leading

to a form of learned helplessness. This risk is potentially compounded by the possibility that where these roles are discontinued, or when a broker is absent, the main conduits of knowledge sharing are lost, including the detailed architectural understanding of how the care system works. As such, efforts might be made to share the expertise or delegate the part of their work to other actors within the care system. A further point for discussion is the important interplay between these discharge coordinators and information systems. In a number of the study sites, key technologies, such as shared records, were administered by the local discharge coordinators, revealing the cumulative advantage of combining the semantic knowledge sharing capabilities of the discharge coordinators with the syntactic information processing of technologies systems, with the former adding supplementary layers of translation and interpretation to the latter.

Finally, group-based activities provided dynamic opportunities for more direct and broad spectrum inter-professional knowledge exchange. These interactions are significant because they allow for disconnected actors to share a common spatial and temporal frame, in which both explicit and implicit knowledge is shared across syntactic, semantic and, importantly, pragmatic boundaries in the processes of interactive problem-solving and decision-making. Although such boundaries are not permanently removed, there is *opportunity* for stark professional boundaries to be de-emphasised and blurred as actors focus attention on the common problems of hospital discharge (Evans and Scarbrough 2014). In this context, groups of professionals might be seen as not only exchanging, but co-producing knowledge relevant to discharge through active inter-professional problem-solving (Ward et al. 2012). Furthermore, these meetings provided platforms for debate and deliberation in which the ideological differences of stakeholders could be shared and potentially revolved or aligned, such as the different philosophies of care between health and social care actors (Glasby 2000).

Seen another way, sustained interaction of this type, especially when facilitated by common information systems and role-based coordinators, can engender mutual learning and inter-professional 'bonding' around shared problem as professional not only learning each other's ways of thinking and working, but develop new ways of thinking and working together.

However, our study found only limited signs of this potential for mutual learning, because group activities varied in their purpose, contribution to care planning, and more importantly, in membership, scheduling and processes. Ward rounds, for example, were clearly dominated by the needs of medical decision-making and gave limited scope for multi-directional knowledge sharing. Daily board rounds were capable of engendering shared understanding within the hospital ward, but did not involve external groups and could be captured by management agenda. Weekly MDTs offered the most realistic possibility for the type of bonding outlined above, but again these varied in terms of membership, with some dominated by medical/surgical interests, and only one site was routinely capable of engaging external health and social care agencies. Furthermore, analysis of these group activities, showed the persistence of institutional power and status hierarchies in the social organisation of healthcare (Currie and White 2012). In particular, medical professionals continue to exert a strong influence on inter-professional working. Furthermore, these interventions, especially group-based, interventions were predominately focused on the hospital sector, and offered limited opportunity for community health and social care providers to participant in decision-making.

Significantly, the study suggests that no single intervention is likely to engender the types of inter-professional knowledge sharing and learning that could enhance the quality and safety of hospital discharge. Rather, we suggest a combination of approaches is needed that enables dynamic and 'multi-channel' forms of information and knowledge sharing across different

syntactic, semantic and pragmatic boundaries (Carlile 2004). Returning to our above descriptive metaphors, we see merit in the role of knowledge 'bridges' for the routinised and regularised exchange of relatively explicit information across syntactic boundaries, together with knowledge 'brokers' to translate more tacit know-how across semantic boundaries, and also activities that enable knowledge 'bonding' through reconciling pragmatic differences. However, it is through a combination of these different forms of knowledge exchange that inter-professional communication and coordination can be enhanced. Specifically, the study suggests that improvements in knowledge sharing and learning around hospital discharge are more likely through a combination of i) a dedicated discharge coordinator role that leads of discharge planning and who can facilitate, rather than replace, interaction amongst the wider system of care professionals; ii) the discharge coordinator has responsibility for administering a shared discharge planning record that complements existing systems, and ideally reduces the burden of duplicate systems; and iii) discharge planning meetings are convened that allow for key representatives of health and social care professionals to participate in care planning, ideally facilitated by a discharge coordinator. However, there were significant differences across the study sites in how care organisations and systems prioritised and resourced hospital discharge.

These recommendations would benefit from further empirical testing, and in different service settings. The challenges to inter-professional communication and coordination extend beyond hospital discharge to include almost all aspects of the care system, especially if one considers that nearly all patient pathways require the involvement of multiple interacting professionals, and where greater integration amongst these professionals is likely to result in more patient-centred and high-quality care (Glasby 2017). There are also inevitable limitations with the study design that make these recommendations tentative. Specifically, the study used no formal

measure of quality or outcome of hospital discharge, e.g. re-admission rates. The study was also limited to only two care systems and two patient groups, and although some description variations were observed across these sites it was not possible to give a full account of the contextual factors driving these variations. And as noted above, significant changes in the organisation of stroke services may render some of the findings that relate to hospital care planning out-dated. That said, the study strengths are found in the depth of insight developed through prolonged ethnographic observations, the comparison of approaches to discharge planning and the use of relevant theory to inform analysis.

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Table 1: Study System Information

	System 1	**System 2**
Population	956,000	790,000
Geography	823^2 miles	2350^2 miles
Number of GP practices	210	126
Acute hospitals	3 large research-intensive hospitals under single management structure	2 medium sized general hospitals under single management structure
Community hospitals	2 community hospitals providing long-term care and rehabilitation	1 community hospitals providing long-term care and rehabilitation
Community care provision	3 rehabilitation and intermediate care services, including nursing care homes with step-down facilities	1 general rehabilitation service, and limited number of specialist nursing care homes
Social Services	Separate City and County social service authorities	Single social service authority covering City and County
Social care provision	Large number of public, private and third sector social care providers	Small number of public, private and third sector social care providers

Table 2: Discharge communication interventions within each study site

System 1		**System 2**	
Stroke	**Orthopaedic**	**Stroke**	**Orthopaedic**
Information Systems: e-Discharge system Dedicated Roles: Discharge Coordinator Community In-reach	Information Systems: e-Discharge system Share Discharge Record Dedicated Roles: Discharge Coordinator Community In-reach	Information Systems: Shared Discharge Record Dedicated Roles: Discharge Coordinator	Information Systems: Discharge pathway tool Dedicated Roles: Discharge Liaison Team

Group activities	Group Activities	Group Activities	Group Activities
Weekly MDT case review Daily Ward/Board Road	Weekly MDT case review Daily Ward/Board Round	Weekly MDT case review Daily Ward Round	Weekly MDT case review Daily Ward Round

Table 3: Interview Participants

Group	**System 1**	**System 2**	**Total**
Medical (hospital)	10	8	18
Nursing	18	15	33
HCAs	5	2	7
Occupational Therapists	10	10	20
Physiotherapists	16	8	24
Other therapists (speech, dieticians)	2	3	5
Pharmacists	1	2	3
Ambulance manager	1	1	2
Administrative	2	2	4
Hospital/Ward Management	3	3	6
Social Work	9	5	14
Social Care	2	2	4
Community Nursing	2	7	9
General Practitioners	1	2	3
GP/CCG administration	2	0	2
Support group/voluntary	4	2	6
Patients	16	14	30
Carers/Family	12	11	23
Total	116	97	213