



City Research Online

City, University of London Institutional Repository

Citation: Williams, S., Radnor, Z. ORCID: 0000-0002-1624-5729, Aitken, J., Esain, A. and Matthias, O. (2021). Transferring, Translating and Transforming knowledge: The role of brokering in healthcare networks. *Journal of Health, Organization and Management*, doi: 10.1108/JHOM-02-2021-0063

This is the accepted version of the paper.

This version of the publication may differ from the final published version.

Permanent repository link: <https://openaccess.city.ac.uk/id/eprint/26352/>

Link to published version: <http://dx.doi.org/10.1108/JHOM-02-2021-0063>

Copyright: City Research Online aims to make research outputs of City, University of London available to a wider audience. Copyright and Moral Rights remain with the author(s) and/or copyright holders. URLs from City Research Online may be freely distributed and linked to.

Reuse: Copies of full items can be used for personal research or study, educational, or not-for-profit purposes without prior permission or charge. Provided that the authors, title and full bibliographic details are credited, a hyperlink and/or URL is given for the original metadata page and the content is not changed in any way.

City Research Online:

<http://openaccess.city.ac.uk/>

publications@city.ac.uk

Transferring, Translating and Transforming knowledge: The role of brokering in healthcare networks

Abstract

Purpose: This research examines how knowledge and information is managed within two care networks. We develop a conceptual framework drawing on the notion of brokering and the 3T framework, which is used to describe the relative complexity of boundaries (referred to in the framework as syntactic, semantic, and pragmatic) as well as capabilities and processes required to exchange information within the network. Previous research on brokering has focused on healthcare managers and professionals this research extends to patients and caregivers. Understanding knowledge exchange and brokering practices in healthcare is critical to the delivery of effective services.

Design/methodology/approach: For this case research non-participant observation and experienced-based interviews were undertaken with healthcare professionals, patients, and caregivers within two care networks.

Findings: Our findings reveal brokering roles occupied by healthcare professionals, patients and caregivers support the transfer, translation and transformation of knowledge and information across functional and organisational boundaries. Enablers and disablers to brokering and the exchange of knowledge and information are also identified.

Research limitations/implications: The study is limited to two care networks for long term conditions within the UK. Further research opportunities exist to examine similar care networks that extend across professional and organisational boundaries.

Practical implications: This research informs healthcare professionals of the brokering capabilities that occur within networks and the enabling and disabling factors to managing knowledge across boundaries.

Originality: This paper provides a conceptual framework that categorises how increased levels of knowledge and information exchange and brokering practices are managed within care networks.

Introduction

Nations such as the UK are looking for ways to redesign the delivery of care with a variety of managerial approaches being introduced (NHS Plan, 2019). Such plans often negatively affect those involved, be they staff, patients or caregivers, especially relating to deficiencies in information. Research charts efforts which have been made to address the impact on people, ranging from exploring institutional inter-relationships and their effect on roles (Spyridonidis and Currie, 2016), to the exploration of customer contact, flow and the degree of customisation (Wikner *et al.*, 2017), which in healthcare has led to a growing campaign for the co-production and co-creation of services (Kaehne *et al.*, 2018; Bovaird *et al.*, 2019; Williams and Radnor, 2021). One of the drivers for customisation, or what is often termed patient-centred care, is the increasing levels of long-term complex multiple patient conditions adding to the difficulties faced by staff of integrating multiple sources of information and treatment initiatives.

The siloed characteristics of healthcare organisations often created by organisational structures (e.g. GP practices versus hospital clinics) and medical specialisation, which are reinforced by separate budgets and different financial systems, hamper, and even disable, communication. Such characteristics create the complexity inherent in healthcare systems and increasingly challenge the transfer of knowledge and information within and across healthcare networks and create the need for brokering. Against this testing background clinicians are still expected to draw knowledge from across the organisational boundaries to deliver patient care (Quartz-Topp *et al.*, 2019). The resultant brokering activities are usually considered as additional costs rather than the necessary glue to support efficient and aligned services and care networks. For the purposes of this paper, we define a care network to include providers from healthcare (primary and secondary care) and other services required to support the patient.

Through exploring the delivery and receipt of care for two long-term chronic conditions we investigate how knowledge and information exchanges are managed. We know information gaps are often bridged by professionals (Currie and White, 2012; Waring *et al.*, 2013) and we know anecdotally that patients and caregivers also broker gaps in healthcare processes, systems and services to ensure relevant information gets to the necessary healthcare professional(s). Currently, what is not well understood is the nature of this brokering role, the gaps brokered, and the brokering strategies used. Previously, brokering in healthcare typically has been explored from the perspective of professionals

(e.g. Currie and White, 2012; Currie *et al* 2015). We build on this research to explore the brokering of information from multiple perspectives.

Brokers sometimes referred to as boundary spanners or occupying hybrid roles, are enablers that help to bridge the knowing-doing gap by acting as conduits for the transfer of resources including advice, social support and information (Moolenaar and Slegers, 2015). Engaging in brokering activities requires both the motivation and ability to translate knowledge and information from one domain to another (Kaplan *et al.*, 2017). Brokers can connect groups by engaging in “transferring, translating, and transforming” practices, what Carlile terms the 3T framework (2004, p. 915). For a broker, the challenge can be to transfer information to an actor who will accept, understand, and value that information (Burt, 2005), along with trust in the brokers and the systems used to transfer information (Platt *et al.*, 2019). One way of dealing with that challenge is developing processes and procedures that support information and knowledge transfer across boundaries (Fernandez-Mateo 2007). Given the increase in hand-offs, which can be defined as transfer and acceptance of patient care responsibility achieved through effective communication (Collins, 2017) and as healthcare service delivery continues to be redesigned, we propose brokering is an essential role in the design and delivery of healthcare networks/services. Using Carlile’s (2004) 3T categorisation framework this paper aims to understand the nature of the brokering roles and the knowledge boundaries within two chronic long-term condition healthcare networks by addressing the following research questions:

RQ1. What type of knowledge/information boundaries exist within two long-term chronic condition care networks?

RQ2. What roles do healthcare professionals, patients and caregivers play in brokering and managing the knowledge boundaries in the two care networks?

RQ3. What strategies are used to ensure brokering capability and sharing of knowledge supports the effective delivery of care?

Next, we acknowledge the importance of patient experience and involvement in the provision of healthcare, followed by a brief review of the brokering literature along with Carlile’s (2004) 3T framework. The methodology, results and discussion are then

1
2
3
4 provided. The paper concludes with a summary of the findings in relation to the research
5 questions followed by the limitations of the study and areas of further research.
6
7
8

9 **Patient and caregivers' experiences and involvement**

10
11 Calls have been made repeatedly to engage and involve patients, caregivers, and the
12 public in their healthcare and particularly for them to be centre of these discussions
13 (Ocloo and Matthews, 2016). Patient and Public Involvement (PPI) is now a key part of
14 healthcare reforms across Western economies (Tritter, 2009; Wait and Nolte, 2006),
15 which advocates that patients and the public can make an important contribution to most
16 stages of healthcare planning and delivery (Coulter and Ellins, 2006). Patients are
17 reported to draw on a mix of illness experiential and biomedical knowledge (Pols, 2014),
18 religious and cultural values, and 'common sense' to frame their ideas, conceptualise and
19 understand their illness experiences (De-Graft Aikins, 2003). A recent study examining
20 patient experience in unplanned hospital readmissions reported both positive and negative
21 experiences of care with the former relating to supportive interactions with staff and the
22 latter associated with suboptimal clinical aspects of their care (e.g. pain relief) (Considine
23 *et al.*, 2019). Issues relating to communication and information exchange were also
24 raised, with some patients reporting they did not receive the information they needed
25 because staff were too busy, or it was not delivered in a way that was not understandable
26 (Considine *et al.*, 2019). In the UK, there are many formal groups and forums associated
27 with public and patient involvement (e.g., Involvement hub – NHS England, Community
28 Health Councils – NHS Wales) which actively look to involve patients in the design and
29 improvement of care. In this paper we are interested in the formal and informal roles of
30 patients and caregivers that exist when involved in receiving, transferring, and managing
31 information associated with their care.
32
33
34
35
36
37
38
39
40
41
42
43
44
45
46
47
48

49 **Brokering in healthcare**

50
51 Research highlights the benefits of being able to broker information between actors and
52 across departments and organisations (often referred to as boundaries) in the treatment of
53 patients (Kellogg, 2014; Broekhuis and Pieter van Donk, 2011). Brokers mobilise
54 information and knowledge through developing collaborative resources, a critical role if
55 value is to be harvested within and across networks (Soda *et al.*, 2018). Within healthcare,
56 professionals are increasingly "being forced to evaluate components across a range of
57
58
59
60

1
2
3
4 different domains – bio-medical, organisational, psychological and social – all at work
5 simultaneously” (Cohn *et al.*, 2013, p.40). This necessitates the need to effectively move
6 information quickly and precisely. Challenges to transferring information and knowledge
7 include the silos, structures and rules which limit interaction across functional and
8 organisational boundaries (Liverati, 2017, Aitken *et al.*, 2020). Professional expertise and
9 standards also hinder information movements due to lack of a common lexicon across
10 task-specific language, institutional protocols, norms and work practices (Kellogg *et al.*,
11 2006). Healthcare professionals usually operate autonomously due to specialisation
12 (Meijboom *et al.*, 2011) increasing the challenges faced by care systems in delivering an
13 integrated care network that many patients need and assume exists. The separation of
14 information systems is also reported as causing a division between professional groups
15 (Karlton *et al.*, 2020). Therefore, moving information amongst professionals and
16 functions, in the treatment of patients, necessitates the bridging of the information gap
17 from between domains to facilitate its transfer from one domain to another (Kaplan *et al.*,
18 2017).

19
20
21
22
23
24
25
26
27
28
29
30
31
32 Bridging the interstices between healthcare professionals to overcome both the structural
33 and task-based difficulties require brokers to “initiate, influence, manage, or facilitate
34 interaction across (sic) boundaries” (Levy *et al.*, 2019, p.426). Brokerage supports the
35 movement of information and resources across siloes within networks. Through their
36 connecting practices brokers can operate as conduits for the transfer of advice, social
37 support, and information (Moolenaar and Slegers, 2015). Bridging the gap allows the
38 broker to create value where the value of the information presented resides in someone
39 else accepting it, and not with its provider. The challenge for the broker is to transfer the
40 information to an actor who will accept and value it (Burt, 2005). Presenting and framing
41 ideas and concepts accurately and concisely to a diverse audience necessitates
42 understanding their needs, capturing their attention, and gaining their support in accepting
43 the information on offer (Soda *et al.*, 2018). It is assumed the broker has a good
44 understanding of the roles, professions, and organisations in which they are brokering,
45 which suggests healthcare professionals are more likely to play this role. However,
46 professional expertise and concerns with institutional arrangements related to indemnity
47 and risk (Vargo and Lusch, 2017) make healthcare networks particularly challenging
48 environments for brokers to engage actors within and across organisational boundaries to
49
50
51
52
53
54
55
56
57
58
59
60

1
2
3
4 support the care network in the delivery of seamless patient treatment. This requires the
5 facilitation of a discussion between professionals, to support the transformation of local
6 knowledge into jointly produced knowledge which must supersede diverging interests for
7 the benefit of the care network (Carlile, 2004). Consequently, boundaries blur between
8 distinctive professional competencies in the pursuit of patient care (Liberati, 2017).
9
10
11
12

13 14 15 **Brokering within and across organisations**

16 Connections between professionals and functions are crucial to ensure an organisation
17 operates effectively and achieves its objectives (Broekhuis and Pieter van Donk, 2011;
18 Fernandes *et al.*, 2018). Where interstices exist, the information flows required to make
19 the organisation work effectively are disrupted at the boundaries between disciplines
20 (Monge and Contractor, 2003). Bridging the gaps provides an opportunity for brokers to
21 reduce the impact and disruption caused by delays to the flow of valuable information
22 and knowledge in an organisation. By leveraging social capital from the connections
23 between organisational actors to close information gaps brokers can perform an
24 “intrapreneurial” role within an organisation (Heng and Loosemore, 2013). For example,
25 intrapreneurial activities in the care sector have been reported in continuous improvement
26 projects where ‘lean champions’ operate as brokers to support changes across functions
27 (Eriksson, 2017). Working across different functions, within the same process, these ‘lean
28 champion’ brokers transform the current knowledge of care actors through developing a
29 common understanding across boundaries of best practices (Lindsay *et al.*, 2020).
30 Similarly, Quartz-Topp *et al.*, (2019) examine how hospital managers design what they
31 term hybrid forums, tools, and professional roles to facilitate the sharing of quality
32 improvement (QI) knowledge, values, and practices with clinicians. The authors make a
33 distinction between different types of knowledge (e.g., managerial QI and clinical QI)
34 and report innovative hybrid tools, roles and forums that help to generate and integrate
35 relevant QI knowledge that is acceptable to both managers and clinicians.
36
37
38
39
40
41
42
43
44
45
46
47
48
49
50
51

52 A broker’s influence in an organisation is not only a function of their legitimate power
53 but a function of their position between functions (Burt, 2005). “Central” brokers located
54 at the intersection of information flows between parties command the most powerful
55 positions while those on the periphery occupy the least powerful positions (Burt, 1992).
56
57
58
59
60

1
2
3
4 These ideas can inform us of the role of healthcare staff and patients/caregivers might
5 play as a conduit in the delivery and co-creation of healthcare services.
6
7
8

9 **3T Framework**

10 We draw on Carlile's 3T framework (Carlile, 2004) to identity how the exchange of
11 knowledge at a boundary is managed. Distinctions are made between three types of
12 relational properties of knowledge at boundaries and how these impact on the movement
13 of information and knowledge. The first is *difference in knowledge* which refers to a
14 difference in the amount of knowledge accumulated (e.g. novice and expert) (Hinds,
15 1999). Within healthcare this could be exemplified by the difference in knowledge held
16 by a first-year trainee nurse and a ward matron. This in turn creates differences in levels
17 of experience, terminologies, tools, and incentives (Carlisle and Rebentisch, 2003). As
18 the difference in the amount of domain-specific knowledge increases between actors, the
19 amount of effort required to adequately share and assess each other's knowledge also
20 increases.
21
22
23
24
25
26
27
28
29
30
31

32 The second knowledge difference at the boundary is *dependence* – without dependence,
33 difference is of no consequence to the actors involved (Carlile, 2004). Dependence can
34 be found in such activities as clinicians and managers co-authoring a patient safety and
35 quality strategy. Knowledge can be different in kind and degree, which means managing
36 dependencies requires the capacity to develop an adequate understanding and common
37 knowledge as resources and tasks change. The third difference relates to how *novel* the
38 circumstances are. This novelty could relate to actors being asked to share knowledge
39 with others and to access knowledge from others. Common knowledge is a boundary
40 object (Carlile, 2002) which actors use to communicate across domains. When novelty
41 is present both the capacity and the ability of the actors to share a common knowledge
42 becomes challenging and an important issue (Carlile, 2004). The greater the novelty the
43 higher the level of relative complexity and effort required to manage the boundary. Actors
44 can misrecognise something that is novel as being known (Levitt and March, 1988), or
45 discard what is novel as being irrelevant (Perrow, 1994).
46
47
48
49
50
51
52
53
54
55
56
57

58 Carlile's (2004) integrated/3T framework, for managing knowledge across boundaries,
59 draws on Shannon and Weaver's (1949) three levels of communication complexity –
60

1
2
3
4 syntactic, semantic, and pragmatic. The most common phrase used to describe movement
5 of knowledge in organisations is “*knowledge transfer*” (Argote, 1999). This *information*
6 *processing* (also referred to as *syntactic transfer*) approach is the most dominant view in
7
8 organisation design and forms the basis of most technology-based approaches to
9
10 knowledge management, where the focus is on storage and retrieval of knowledge
11
12 (Davenport and Prusak, 1998). This assumes there is sufficient stable conditions that
13
14 support the development of common knowledge and lexicon; simply transferring
15
16 knowledge can be problematic when novelty arises as it may be difficult to represent the
17
18 differences and dependencies that are likely to be present due to the absence of a common
19
20 understanding.

21
22
23 Movement from the syntactic to *semantic* boundary occurs when novelty makes some
24
25 differences and dependencies unclear or some meanings ambiguous rendering knowledge
26
27 difficult to transfer. This requires *translating knowledge* where mechanisms or roles are
28
29 developed to help create ‘shared meanings’ and bridge the gap between actors different
30
31 interpretations – these might include cross-functional teams, co-location and individuals
32
33 to operate as brokers and translators (Hargadon and Sutton, 1997). Two critical abilities
34
35 are required (Breidbach *et al.*, 2013):

- 36 1. The ability to externalise knowledge to develop a common meaning – making
37 tacit knowledge explicit is critical to the flow of information.
- 38 2. The ability to negotiate varying interests therefore developing a willingness for
39 actors to alter knowledge and interests from their own domain.
- 40
41
42
43

44 Together they enable the broker to frame ideas and concepts contextually, accurately and
45
46 concisely, in an audience-specific way, and present them through common meanings such
47
48 that they are readily accepted (Soda *et al.*, 2018).

49
50
51 The *pragmatic* boundary refers to situations where novelty results in different interests
52
53 among actors that need to be resolved. This means that domain-specific knowledge and
54
55 common knowledge will need to be transformed to effectively share and assess
56
57 knowledge at the boundary. Transforming knowledge that can be shared and assessed
58
59 requires substantial practical effort and actor willingness to enact common interests to
60
facilitate sharing at the boundary (Carlile, 2004). The ability to influence other actors to

1
2
3
4 develop a common interest in transforming knowledge is a critical capability when faced
5 with increasing levels of novelty. Team working is one mechanism to help transform
6 knowledge along with boundary objects such as drawings and other visuals (Carlile,
7 2002).
8
9
10

11
12 The 3T framework is helpful to categorise and show the relative complexity of a boundary
13 (e.g. syntactic, semantic and pragmatic) and to identify the different types of capabilities
14 (e.g. transfer, translate and transform) that exist for exchanging knowledge. Although the
15 three types of boundaries are clearly defined, the transition where one ends, and another
16 begins is not often easily identified by the actors involved. This lack of clarity creates
17 mismatches between the type of boundary and the capability/process used to share
18 knowledge. In this study, we employ the framework to understand the brokering of
19 knowledge and information within and across boundaries of the two care networks.
20
21
22
23
24
25
26
27

28 **Conceptualisation of the 3T framework for care networks**

29 Drawing on Carlile's (2004) work this paper aims to examine how knowledge and
30 information is transferred within a healthcare environment. We have identified from the
31 broker and knowledge management literature important factors that need attention when
32 transferring, translating, and transforming information where there are multiple actors
33 within a care network. Figure 1 illustrates our knowledge boundary management
34 framework based on the 3T model. Relational factors identified from the literature that
35 are likely to influence the management of information and knowledge across boundaries
36 in a care network are social capital and ability to effect relationships, framing ideas and
37 concepts to various actors and articulating the value of the information and encouraging
38 others to engage.
39
40
41
42
43
44
45
46
47

48 Insert Figure 1 about here
49
50
51

52 **Methodology**

53 Case study research is acknowledged as a methodology and strategy of inquiry (Yin,
54 2014). It facilitates 'exploration of a bounded system through detailed, in depth data
55 collection involving multiple sources of information and reports a case description and
56 case-based themes' (Creswell, 2007 p. 73). Our research questions lend themselves to an
57 exploratory approach and an inductive methodology to allow the building of theoretical
58
59
60

insights (Yin, 2014). Case study research is designed to optimise understanding of the case rather than to generalize beyond it (Stake, 2005), although we envisage the insights into the nature and role of brokering will be relevant in other healthcare situations where patients frequently transition professional and organisational boundaries and particularly where these are not well-connected in relation to knowledge/information exchanges.

This single setting case research was conducted within the UK NHS healthcare system and focused on long term conditions (see Figure 2). The first sub case was chronic obstructive pulmonary disease (COPD), a long-term respiratory condition. The network (often termed a care pathway) covered providers and services in both primary care (GPs, community nursing) and secondary care (clinics, in-ward, emergency admissions). The second sub case was Huntington's Disease (HD), a progressive neurological condition caused by a defective gene. The services for this care network were mainly based in the community provided by two specialist multi-professional teams based in different areas of the UK. Figure 3 shows the key actors involved in each of the care networks.

Insert Figures 2 and 3 about here

Both the HD and COPD care networks rely on a variety of actors to work together to provide care to patients. These two networks were selected as both focus on long-term chronic conditions. For HD prevalence in 2010 was estimated to be 12.3 per 100,000 persons in the UK (Evans *et al.*, 2013). For COPD prevalence is estimated to be 2000 per 100,000. This is for those patients that have been diagnosed with COPD in the UK (British Lung Foundation, 2020) it is estimated there are many more people living with COPD without a formal diagnosis. Regarding volume of patients, complexity of conditions and variation of need, requirements will be different for each network. Using two different care networks enables us to develop greater theoretical insights of knowledge exchange and the roles of those brokering networks and services.

Experienced-based semi-structured interviews were conducted with 45 healthcare professionals, patients and caregivers (see Table 1) from the two care networks, which included secondary (hospital) and primary (Specialist community nurses) care. Approval was obtained from the NHS Research Ethics Committee (IRAS 158439). All participants

1
2
3
4 were provided with information sheets via email (staff) or at clinics or family groups
5 (patients/caregivers). Informed consent was obtained from all participants prior to
6 conducting the interviews. The inclusion and exclusion criteria for the selection of
7 participants are shown in Table 2. Patient and caregiver participants were recruited via
8 the senior team lead or physician for each of the care networks.
9

10
11
12
13
14
15 Participants were selected based on their knowledge and experience of either providing
16 care or living with COPD or HD. This approach to sampling allowed us to deliberately
17 include a range of key participants with access to important sources of knowledge and
18 experience of the two care networks (May, 1995). Of the 23 patients invited to join the
19 study 12 agreed and 8 caregivers participated. There were no withdrawals from the study.
20 Twenty-eight staff participants were contacted directly either in person or by email, 25
21 agreed to participate in the study.
22
23
24
25
26
27

28
29 Non-participant observations were undertaken with the COPD and HD staff teams. For
30 the COPD care network this involved observing three ward rounds (7.5 hours).
31 Interactions between health professionals, patients and caregivers were observed along
32 with sources of information relating to the condition. The HD care network involved the
33 observation of three patient and caregivers support groups (6 hours). Research notes of
34 the setting, experiences of the care pathway, and knowledge/information exchanges were
35 compiled immediately after each observation and triangulated with the interview data.
36
37
38
39
40
41

42 *Insert Tables 1 and 2 about here*
43
44
45

46 The interviews with healthcare professionals were conducted at their place of work. In
47 the case of patients and caregivers, the interviews were carried out at their homes.
48 Interview guides were prepared for patients and caregivers (see Table 3) and staff
49 participants (see Table 4), which explored the design of the network, experiences of those
50 giving and receiving care, areas of good practice and possible improvements. The
51 duration of the interviews was typically between 45 to 90 minutes. The interviews were
52 transcribed verbatim with dialect (Gibbs, 2018) and manually coded and analysed using
53 King's (2004) thematic framework. This template approach allows for the development
54 of conceptual themes and clustering of these themes into broader groupings (Cassell and
55
56
57
58
59
60

1
2
3
4 Symon, 2004). Template analysis requires a list of codes or a ‘template’ to be produced
5 which represents themes identified in textual data (King, 1998). The initial area of
6 enquiry for the main study was the design of care pathways (for further details see authors,
7 2017; 2020). Here we have used relevant parts of the data set that focused on brokering
8 and information/knowledge exchange.
9
10
11
12

13 *Insert Tables 3 and 4 about here*
14
15
16

17 **Data and analysis**

18 Fully transcribed interviews and observational notes provided a rich set of data which
19 were analysed through the construction of an initial template based upon two key
20 signposts: the first was the main research topic for this paper, brokering in the context of
21 knowledge exchange and information sharing. The second was the key themes that
22 emerged from reading the first few transcripts. The development of themes was iterative
23 given there were staff, patient and caregiver participants. The template reflects a
24 hierarchical structure of *a priori* codes (e.g. knowledge sharing) which are then
25 subdivided into lower order codes (e.g. availability of patient records/history). An extract
26 from the coding template is shown in Figure 4. Once key themes were identified the order
27 was decided post analysis. Illustrative examples are highlighted using direct quotes from
28 the participants.
29
30
31
32
33
34
35
36
37
38

39 *Insert Figure 4 about here*
40
41

42 This paper reports only on the themes that emerged from the data specifically relating to
43 the type of boundaries, the processes used to transfer information and knowledge, and
44 roles defined as brokering which occurred within and across the two care networks. Other
45 themes directly associated with improving the design of the patient pathway/network are
46 outside the scope of this paper and have been previously reported (Authors, 2017; 2020).
47
48
49

50 Much of this activity occurred at the interface of professional and organizational
51 boundaries. Patients (and caregivers) were asked to describe their journeys prior to and
52 since their diagnosis, which included explaining what had gone well and what could be
53 improved. Healthcare professionals from both the community and acute providers were
54 asked to share their understanding of the care network, how it works and their role within
55 the network. Understanding and mapping the experiences of participants enabled us to
56
57
58
59
60

1
2
3
4 identify how knowledge was exchanged and the information gaps in the network. These
5 then enabled us to code and classify the activity in terms of knowledge and information
6 sharing, the types of brokering undertaken and identifying boundary issues.
7
8
9

10
11 To enhance external validity, a combination of within case and cross case analyses was
12 adopted (Yin, 2014). Within case analysis identified the brokering and knowledge
13 exchange by each care network. For the cross-case analysis, similarities and differences
14 across the two networks were identified. For internal validity, the results were presented
15 to healthcare professionals and patient and caregiver support groups. Several steps were
16 also taken to protect against bias and enhance the reliability of the findings, which
17 included the triangulation of interview and observation data, two of the authors checking
18 the coding of the data and the findings being reviewed by all authors.
19
20
21
22
23
24
25

26 **Findings**

27 From the analysis of the interview and observational data, it was evident healthcare
28 professionals, patients and caregivers all occupy brokering roles in both care networks.
29 Using the framework developed earlier (Figure 1), this paper identifies the gaps between
30 actors and reports on the activities used by participants to transfer, translate and transform
31 information across these interfaces. The results are presented in relation to the key themes
32 identified from the template analysis.
33
34
35
36
37
38
39

40 *1. Information accuracy and availability*

41
42
43
44 Issues relating to the accuracy and availability of information were highlighted mainly by
45 staff participants from both acute (hospital) and community settings. One of the examples
46 given was trying to locate records if patients were not known to the hospital or were from
47 out of the geographic area covered by the hospital. *“So if they’re [patient] not known, if*
48 *they haven’t come into hospital before, or they haven’t come to a clinic ………, we have no*
49 *history whatsoever. … it would be too time-consuming for us to go, to speak to each of*
50 *the primary care services to find out what’s happened for that patient. So we rely on*
51 *what the patient tells us.”* (COPD staff participant). The patient in this instance must
52 translate their knowledge (semantic) of their condition in the absence of patient records.
53
54
55
56
57
58
59
60

1
2
3
4 The availability of information was also problematic if these ‘unknown’ patients were
5 admitted to the emergency department outside the hours of primary care services such as
6 GP practices. In such cases patients and caregivers are asked to act as a conduit and
7 provide as much detail of medical history and symptoms until other information can be
8 located. If a patient arrives from a nursing home, it is more likely a caregiver will provide
9 a care plan which helps to transfer important medical information across the acute and
10 community organisational boundary.
11
12
13
14
15
16
17

18 Multi-disciplinary/professional teamworking helps to bridge some of the information. For
19 example, when a patient is admitted onto a ward, then a pharmacist will help with
20 medication history by checking what medication the patient or family bring into the
21 hospital and by consulting the GP surgery. Such action provides a brokerage service
22 through transferring information across the syntactic boundary. To improve the
23 availability of information, one staff participant spoke of the development of a chart/
24 booklet for HD patients to help with this issue: *“We’re trying to establish sort of charts
25 and sort of booklets with their (patients) medicines in, so in case they go to hospital and
26 they’ve got all that information there for them and the families know as well... for some
27 people, just a little notebook with everybody who’s involved.”* (HD Staff participant).
28 Such artefacts help to create a shared meaning to support knowledge and information
29 transfer across the syntactic boundary.
30
31
32
33
34
35
36
37
38
39

40 Much of the interview data referred to transferring information when not easily located
41 within the care network. However, in the case of HD patients and caregivers the
42 transferring of data may also extend to translating the information if clinicians were not
43 familiar with the condition. Requiring the patient/caregiver to operate as a broker across
44 the semantic boundary to translate their knowledge in a shared meaning with the care
45 provider. This may occur when a HD patient is admitted to an emergency department and
46 access to medical records, or the specialist HD team are not available.
47
48
49
50
51
52
53

54 2. Knowledge of condition

55
56
57

58 The level of knowledge of professions and patients/caregivers varied depending on the
59 condition. For COPD the knowledge resided more with the healthcare professional
60

1
2
3
4 participants than the patients. Several of the patient participants spoke about requiring
5 further information about their condition, with some locating information from online
6 sources. One participant noted the lack of information available on wards, which as an
7 inpatient, he had the time to read and felt would enable him to further his knowledge and
8 management of his condition. Conversely for HD it was the patients and caregivers who
9 were likely to have more knowledge of the condition than professionals working outside
10 of specialist HD teams. Through transferring and translating this experiential knowledge
11 patients/caregivers attempt to bridge the gap in the care network therefore retaining the
12 value co-created in previous treatment occasions. However, as noted by one participant
13 this approach is only successful if the patient/caregiver can engage and communicate with
14 the healthcare professional to make her/him accept the knowledge being offered. The
15 novelty of disease often leads to patients translating knowledge for the healthcare
16 provider.
17
18
19
20
21
22
23
24
25
26
27

28 Several patient and caregiver participants spoke about the difficulty of getting a diagnosis
29 both for HD and COPD. One patient spoke about the struggles of communicating with
30 the GP to get a referral to a HD clinic. A caregiver recalled a discussion with a GP stating
31 “*you haven’t got HD, you’ve got no symptoms and here’s some paperwork... He (the*
32 *patient) came away, he read the information, he went back again and saw Dr ... who*
33 *referred him for the test*”. The caregiver spoke about the importance of being able to
34 share the knowledge and information in a way that assisted the GP to overcome a
35 pragmatic boundary by understanding the early signs of what for many would be a ‘novel’
36 condition.
37
38
39
40
41
42
43
44
45

46 Another caregiver spoke of the late diagnosis of her husband’s HD. “*It wasn’t picked up,*
47 *I knew there was something wrong, so eventually I wrote down the symptoms and we took*
48 *the letter to the doctor*”. The caregiver acted as a broker to engage and raise the interest
49 of the doctor to assist them at the pragmatic boundary. Both situations may relate to
50 assuming there is sufficient common knowledge by all actors involved (professionals,
51 patients, and caregivers) for knowledge and information to be transferred. As noted
52 earlier, this can be problematic when novelty arises in situations where the healthcare
53 professional’s awareness or knowledge of HD is limited and/or where patients and
54 caregivers experience difficulties in communicating the relevant symptoms – hence the
55
56
57
58
59
60

1
2
3
4 difficulties of being able to represent the differences and dependencies which are likely
5 to be present due to the absence of a common understanding. For HD the results indicate
6 that the patient/caregiver may need the brokering capabilities of creating sufficient
7 interest for the care provider to engage them in transforming their knowledge at a
8 pragmatic boundary.
9
10
11
12

13
14 COPD patients also spoke of the difficulties of getting referrals to clinics. *“I saw several*
15 *doctors before I was eventually referred to Dr clinic, despite going to the surgery*
16 *several times with the same issues”*. It was unclear from the participants whether the
17 issues occurred due to not explaining the symptoms in sufficient detail or that the
18 healthcare professional was unaware of the condition. Several of the COPD participants
19 again referred to the internet to help them understand the symptoms and one suggested
20 this had helped her to articulate her condition in *“a better and more understandable way”*.
21 For COPD patients the development of their common knowledge and lexicon, through
22 codified sources, can assist them in brokering the exchange of knowledge with care
23 providers at the syntactic boundary. It is possible in such situations where the novelty of
24 the condition is misrecognised as being already known or discarded as irrelevant. This
25 challenge is apparent with conditions such as HD where care professionals may not have
26 the knowledge or interest in assessing the patient from that novel perspective.
27
28
29
30
31
32
33
34
35
36
37
38

39 3. Information sharing

40
41
42 Several of the staff participants from both networks spoke about the importance of good
43 governance and protocols being in place to ensure appropriate sharing of information.
44 Whereas some patient participants, although presumed information would be shared with
45 care providers, were less clear how this might occur. For example, one inpatient COPD
46 participant spoke of the various members of staff he had seen since being admitted to
47 hospital and his assumption that information would be shared with his GP: *“So I would*
48 *imagine there’s going to be some sort of liaison with my GP”*. However, he was unclear
49 how this information would be provided and when this might happen.
50
51
52
53
54
55
56

57
58 Another patient participant mentioned the need for more information about her condition
59 *“... just knowing isn’t it?”* but unclear where or how to access this. As noted previously,
60

several of the patient participants mentioned they had consulted the internet to find more information about their condition or services in the area. Such information and access to services is important for the experiential understanding of the condition and the development of common language to be shared with care providers, with the caveat such information is obtained from reliable sources.

Specialist healthcare professionals also occupied a brokering role within both networks. These can be in the hospital (respiratory) or in the community (respiratory and HD) and regularly 'inreach' or 'outreach' to services to bridge the gap between acute and community care and/or health and social care. For example, one COPD staff participant explained, "*If the patient is not known to us on the ward, we contact the community respiratory team.*" The common knowledge and lexicon supported the sharing of knowledge and information across the syntactic boundary. Similarly, within the HD network an example of brokering information with social workers was given: "*I was just asking for some information on what nursing homes might be suitable for somebody, so I can email that back,*" HD staff participant. This was further illustrated by participants developing their own systems to broker information flows across a network of care providers: "*I've got a document I keep... that's got all the useful contacts I've ever run into along the last ten years.. so all the CCGs (Clinical Commissioning Groups) and CHC (Continuing Healthcare) nurses that I've ever had anything to do with... they will be different depending on the area,*" HD staff participant.

Discussion

Our findings uncovered that information accuracy, availability and sharing as well as knowledge of the condition are important issues facing actors across interfaces. Revealing the different brokering roles occupied by healthcare professionals, patients and caregivers which support the transfer, translation and transformation of knowledge and information across functional and organisational boundaries. Table 5 summarises the results and key themes as well as the boundary issues faced by actors, the knowledge boundaries that exist and the broker capabilities used to address them. Staff, patient, and caregiver participants were found to engage in all three brokering practices – transferring, translating and transforming information.

1
2
3
4 Insert Table 5 about here
5
6
7

8 Participants shared many examples of syntactic boundaries where they needed to transfer
9 information. However, *information accuracy and availability* were identified mainly by
10 care staff participants as being problematic within both networks. It was evident from
11 the COPD network that transferring information was crucial as patients often cross
12 organisational boundaries for their care (e.g. from community to secondary care). In the
13 case of the HD network, given the ‘novelty’ of the HD condition common lexicons to
14 support the transfer of information were often not sufficient to represent the differences
15 (Carlile, 2004). Therefore, information translation and transformation were more
16 prominent among the HD team and caregivers. As Carlile (2004) notes while a common
17 lexicon is necessary, it is not always a sufficient type of common knowledge to share and
18 assess a domain (in this case which requires specific knowledge). Closing the knowing-
19 doing gap is dependent on actors being able to understand and value the relevance of the
20 knowledge.
21
22
23
24
25
26
27
28
29
30

31
32 Analysis of the HD network data provided examples of where *knowledge of the patient’s*
33 *condition* was transformed by the family when interacting with services that had limited
34 or no knowledge of HD (e.g. hospital or GP practice). This reduced the novelty of the
35 condition for healthcare professionals with limited or no experience of the condition,
36 through developing a brokering mechanism that provides a basis for shared meanings
37 across knowledge boundaries. The staff participants from the HD specialist community
38 teams provided examples of transforming information to enable their patients and
39 caregivers to interact and access public services such as housing, benefits, and transport.
40
41
42
43
44
45
46

47 *Information sharing* across organisations is one of the tenants of partnership working that
48 is reported to lag general partnership working (Richardson and Asthana, 2006). One issue
49 raised by several of the participants related to the structures and protocols which can
50 hinder embedding knowledge and interaction across organisational and functional
51 boundaries for healthcare professionals (Kellogg *et al*, 2006) and therefore patient and
52 caregiver involvement and knowledge transfer are treated with caution. This caution is
53 likely to be heightened with the rarity of the condition. Yet, as noted here, the
54 patients/caregivers are more likely to occupy the (unpaid) role of the broker and share
55
56
57
58
59
60

1
2
3
4 information and knowledge particularly at the pragmatic boundary to assist care providers
5 that are less familiar with the condition. However, the challenge of being able to
6 communicate the information in such a way that it is received and valued by the receiver
7 remains.
8
9

10
11
12
13 Issues around information sharing can be heightened due to poorly integrated systems
14 where information is not transferred across the organisational boundaries e.g. primary and
15 secondary care. Other knowledge boundaries exist due to the lack of or incompleteness
16 of common lexicons to translate the information into common knowledge e.g. discharge
17 letter, in other words the knowledge is not fully embedded within the local systems.
18
19
20
21

22
23 Table 6 develops our understanding of knowledge boundary management by providing
24 examples of relational knowledge types and the main issues experienced by participants
25 from both networks due to differences in knowledge between actors, dependence related
26 challenges and the impact of increasing novelty. All three types of relational knowledge
27 types were found to exist in both care networks creating boundaries between actors. The
28 effectiveness of the brokering practices was influenced by language (ability to translate),
29 'power' relationships (ability to be heard/respected) and being able to garner the interests
30 of other actors to create and assess new or novel knowledge.
31
32
33
34
35
36
37
38

39 Insert Table 6 about here
40

41
42 Carlile (2004) argues as the novelty increases in relation to the information the greater
43 need for information to be transformed. The HD network provides examples of where
44 healthcare professionals frequently act on behalf of their patients and families to broker
45 the knowledge and information boundary between health and other services. The rarity
46 of the HD increases the novelty of the information and highlights the need for
47 participatory and relational nature of the actor's role. Previous research has shown that
48 actors can misrecognise novelty as something that is already known (Martins and Kambil,
49 1999) or discard what is novel as irrelevant (Perrow, 1994). Such situations might arise
50 where the patient/caregiver's experiential knowledge of the condition is not
51 acknowledged. Or when a specialised team does not recognise others in the network
52 might be less familiar with the condition and need to have additional information or
53 develop more knowledge to ensure what is novel about the condition is not disregarded
54
55
56
57
58
59
60

1
2
3
4 as being irrelevant. Several of the staff participants raised the need for stability of the
5 team membership which enables relationships to be established both with patients,
6 caregivers, and other services. Participants believed this stability enabled more effective
7 bridging of professional, functional and organisational boundaries.
8
9
10

11
12
13 In this study, the need for brokering occurred within both COPD and HD networks at
14 particular service intersections:
15

- 16 • Between patients and caregivers;
- 17 • Between patient/caregiver and health and social care professionals;
- 18 • Between specialist healthcare professionals and other health and social care
19 professionals;
- 20 • Between specialist healthcare professionals, patients/caregivers and other public
21 services.
22
23
24
25
26

27 Actors actively operate as brokers to bridge knowledge and information gaps through
28 developing workarounds for information flow issues or implementing mechanisms that
29 support the translation or transformation of knowledge at boundaries. For specialist
30 healthcare professionals operating at intersections within their own organisations (e.g.
31 respiratory specialist nurse brokering between the respiratory ward and Accident and
32 Emergency Departments) these brokering activities can be described as intrapreneurial.
33 With the specialists brokering the translation of knowledge on current best practices for
34 other care actors.
35
36
37
38
39
40
41

42 Entrepreneurial roles were identified for example through the HD team brokering
43 practices that close gaps across organisational boundaries through transferring, translating
44 and transforming knowledge to support colleagues in accepting the value of the
45 information that is being shared. Therefore, retaining and enhancing the value of
46 knowledge that has been co-created within the care network. Those occupying these roles
47 have the social capital gained from these relationships (Brass, 2003) to influence and
48 support the flow of information within the network and add value to the patient experience
49 (Burt 2005; Currie and White, 2012).
50
51
52
53
54
55
56

57
58 Previous research on brokering has focused largely on professional and managerial roles
59 (Currie *et al.*, 2015; Currie and White, 2012; Quartz-Topp *et al.*, 2019). Here we start to
60

1
2
3
4 identify how patients and caregivers address and bridge the information accuracy,
5 availability and sharing as well as knowledge of the condition gaps that often occur
6 between professionals and different organisations within the care network. This is a
7 capability that has been largely anecdotal until now. A role we also describe as
8 entrepreneurial, as patients ensure information about their condition is
9 transferred/translated/transformed to relevant professionals within the care network.
10
11
12
13
14
15

16 These entrepreneurial roles of patients and caregivers were emergent and not part of
17 formal expert patient programmes, which are designed to improve patient's skills and
18 knowledge of their disease (Griffiths *et al.*, 2007). Brokering the transfer of knowledge
19 between care and other professionals can be challenging because not all patients and
20 caregivers have the social capital to enact such roles, to address information and
21 knowledge gaps, particularly when required to interact with institutional protocols and
22 negotiate an information/knowledge system which is often poorly integrated. They also
23 need to be able to work with task specific lexicons and practices to localise knowledge
24 (Carlile, 2002). Recognising these potential obstacles has led to the development of
25 brokering mechanisms, by specialist healthcare professionals, on behalf of HD patients
26 which support the translation and transformation of their condition.
27
28
29
30
31
32
33
34
35
36

37 Interestingly none of the participants described or recognised their experiences as
38 bridging gaps in the provision of knowledge or receipt of care. The brokering capabilities
39 were largely about connecting actors within the system to aid the flow of information,
40 knowledge and value, which then aids patient flow and improves patient experience.
41 However, what is not clear from this research is the action taken by organisations to
42 ensure either the brokering role is formally recognised, or steps are taken to bridge the
43 knowledge/information gaps occupied by the broker. Overlooking the brokering activity
44 can potentially introduce vulnerability into the network.
45
46
47
48
49
50
51
52

53 As a result of this research, we have identified several enabling and disabling factors (see
54 Figure 5) that will impact the capability of the broker and how knowledge/information is
55 managed and embedded within and across boundaries. Identifying these factors provides
56 an opportunity for healthcare networks to develop strategies to ensure equality of support
57 given to patients. These insights enable us to further develop our knowledge boundary
58
59
60

1
2
3
4 management framework presented earlier in the paper. Enabling factors associated with
5 broker capability to transfer information at syntactic boundary include having the
6 appropriate support in place for patients/caregivers to be able to present information in
7 way that can be heard and received by other actors. For the semantic boundary, an
8 enabling factor is the ability to translate information so that it is valued by other actors.
9 Enablers for the pragmatic boundaries focus on the transforming information to legitimise
10 the ‘informal’ role and power of brokers operating at and across boundaries. Disabling
11 factors related to broker capability can be identified depending on the complexity of the
12 boundary. For example, patients/caregivers’ limited knowledge of their condition could
13 inhibit the transfer (syntactic) of information to other actors. The translation (semantic)
14 of information could be hampered by external factors such as organisational structures
15 and systems. Whereas the transforming (pragmatic) of information could be limited by
16 actors’ knowledge and exposure to rare diseases/conditions such as HD.
17
18
19
20
21
22
23
24
25
26
27

28 Enabling factors relating to the relational property of knowledge is the use of common
29 lexicons to help brokers to understand and frame their knowledge to transfer to other
30 actors. Specialist teams are also seen as enablers to translating and transforming
31 information for various actors to establish effective and collaborative relationships across
32 the network – in the case of the HD network this was achieved by the specialist team
33 developing their own register of contacts. The inhibiting factors of the relational property
34 of knowledge included poorly integrated systems, silo working and resource constraints
35 to support the development of collaborative partnerships. It is here that we suggest focus
36 needs to be on the development of appropriate strategies and institutional policies to
37 support the enablers and reduce or address the disablers.
38
39
40
41
42
43
44
45

46 *Insert Figure 5 about here*
47
48

49 **Conclusion**

50 This paper examines the experiences of healthcare professionals, patients and caregivers
51 occupying a brokering role within designated long-term condition healthcare networks.
52 Drawing on Carlile’s (2004) 3T framework and the concept of brokering, this research
53 provides insight to the how and why brokering occurs. This research considers three
54 questions, the first being the nature of the information boundaries that exist within two
55 healthcare networks. Using the knowledge boundary management framework (Figure 1)
56
57
58
59
60

1
2
3
4 the three knowledge boundary types (semantic, syntactic and pragmatic) were identified
5 across the two care networks examined. Our HD case illustrates the differences and
6 dependencies that exist when the novelty of knowledge increases, which in this case was
7 due to the rarity of the condition. Brokers needed to not only transfer information but also
8 translate and transform for those less familiar with the condition. Such activity requires
9 HD patients and caregivers to build a knowledge base of the condition to enable them to
10 fulfil this role and level of exchange, which may also create inequalities between people
11 with different social capital.
12
13
14
15
16
17
18
19

20 Our second enquiry was the type of brokering roles occupied by healthcare professionals,
21 patients, and caregivers. The examples provided by the participants suggested most of the
22 brokering activity was connecting poorly aligned organisations and functions. Building
23 on the brokering activity, knowledge transfer, translation and transformation were all
24 evident from the analysis of the data. Localising and embedding knowledge in practice
25 is often hampered by organisation structures and systems. It is also evident that some of
26 the brokering roles are informal and emergent particularly those associated with patients
27 and caregivers.
28
29
30
31
32
33
34

35 The final question considered the strategies employed to ensure information/knowledge
36 flows to support the effective delivery of care. From our in-case and cross-case analyses
37 we found differences in knowledge levels, dependence among actors and novelty of
38 condition/ information are likely to influence the strategies required. For the COPD
39 network the care professionals are seeing many cases against which (over and above
40 professional protocols) influences their expectations about the most likely route/pathway
41 the patient will experience. However, patients will only be familiar with their own
42 condition and therefore may not know how to access and/or transfer this knowledge to a
43 common lexicon. Instead moving to other forms of information which are accessible but
44 not necessarily reliable. Therefore, for the more novel/rare conditions there is a greater
45 need for knowledge translation and transformation strategies.
46
47
48
49
50
51
52
53
54
55

56 Silo working (which may be interpreted as professional boundaries) will also impact on
57 the sharing of information and knowledge and strategies are required by actors to ensure
58 transfer, translation and transformation occurs. The constraint surrounding the 'freedom'
59
60

1
2
3
4 to transfer, translate, transform is assumed in the framework but in practice is actively
5 constrained (legal/professional) in this setting and more likely to be constrained
6 elsewhere given changes in personal data legislation. The owner of the data is the
7 professional/organisation, yet it is the patient/caregiver who is often the conduit and is
8 therefore a key actor for looking at knowledge and information with the individual as the
9 enabler. Similarly, the movement of data is often constrained by the lack of IT
10 connectivity which in the absence of brokering could lead to poor service delivery.
11
12
13
14
15
16
17

18 This case research has identified the importance of brokering capability and
19 knowledge/information exchange within the delivery of care for two long-term
20 conditions. The results are important for healthcare organisations as without brokering
21 healthcare professionals and their patients would face the challenges of longer hospital
22 stays, greater pressure on resources and equipment and increases in non-value-added
23 activities due to delays in information transfer and decision-making. Further research is
24 needed to understand the transition between the different types of boundaries and to assess
25 how similar or dissimilar the knowing-doing gap is within dissemination and
26 implementation research.
27
28
29
30
31
32
33
34

35 Although there is a long history of and widespread support for patient and public
36 involvement, considerable barriers still exist (Ocloo *et al.*, 2021). This research provides
37 an important starting point for understanding the enabling role and capabilities of patients
38 and caregivers in brokering knowledge and their important contribution to the
39 management of information flows within their care networks. Recognition of such patient
40 and public involvement activity needs to be carefully managed and valued if its full
41 potential is to be realised. This research supports the call for better support, clarity of roles
42 and expectations and the provision of knowledge, clear information and communication
43 which will all positively impact on patient and caregiver involvement (Ocloo *et al.*, 2021).
44 Organisational strategies such as creating patient stories and holding 'listening events' to
45 enable patients and caregivers to share their stores of service use and brokering activity
46 would serve to inform and educate other actors within the network (Condon, 2019). This
47 current conceptual framework is mainly predicated on equal capability across all actors.
48 Barriers to involvement such as illness, which is often age related, low literacy,
49 communication, or language difficulties (Ocloo *et al.*, 2021) need further consideration.
50
51
52
53
54
55
56
57
58
59
60

1
2
3
4 Further research is required to understand what strategies need to be in place to support
5 those less able (cognitively, educationally) to occupy this role and where advocacy can
6 assist in the provision of treatment equality.
7
8
9

10
11 Often brokering roles are emergent, unpaid and operate outside formal programmes such
12 as patient expert programmes. The challenge for healthcare professionals is to identify
13 who is undertaking such activity and the recognition of varying levels of professionalism
14 and maturity within such roles. There is a need to understand where and when in the
15 network brokering might occur, by whom and for whom.
16
17
18
19
20
21

22 This single case study is limited by the small sample of two care networks of chronic
23 long-term conditions in the UK and therefore generalising results beyond what is reported
24 here is limited (Stake, 2005). However, this case provides interesting and important
25 information about the setting of two chronic condition care networks (Gibbs *et al.*, 2007).
26 It is likely chronic condition services in other geographical areas are arranged in similar
27 ways with cross professional and organisational boundaries. Such care settings would
28 enable the further testing of the conceptual framework provided. Other areas of enquiry
29 should focus on developing a greater understanding of the roles of social capital,
30 legitimacy and power held by the broker, along with the value of brokering by various
31 actors, and the cost of brokering.
32
33
34
35
36
37
38
39
40

41 Here we have started to investigate the role of patients and caregivers in brokering
42 information and knowledge within a care network. Currently, this is a role that is
43 invisible, unpaid, and not formally recognised within the realms of patient and public
44 involvement. Further research needs to formally recognise and build on these exchanges
45 to enhance person-centred care. Similarly, understanding the impact of
46 information/knowledge brokerage on patient outcomes is an important area for healthcare
47 organisations and care networks to consider (Heng and Loosemore, 2013). Brokering as
48 identified in this study is dependent on the capability and availability of the various actors,
49 which presents issues of equality and risks of suboptimal pathways to care.
50
51
52
53
54
55
56
57

58 This paper provides a novel extension of the 3T framework (Carlile, 2004) for managing
59 knowledge across boundaries. Importantly, we move the 3T framework from a
60

1
2
3
4 categorisation tool to a knowledge boundary management conceptual framework. In
5 addition, we have identified enabling and disabling factors that could be used to inform
6 the development of strategies that need to be in place to enhance the patient care role in
7 brokering. As such, this paper furthers our understanding of the brokering capabilities
8 needed to manage knowledge and information and provides a basis for future research,
9 as well as guidance for healthcare professionals facing increasing handoffs and more
10 complex conditions.
11
12
13
14
15

16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60

- Aitken, J., Esain, A and Williams, S (2020), "Management of complexity in the care ecosystem". *Supply Chain Management: An International Journal*, Vol. 26, No. 4, pp. 481-494. Doi.org/10.1108/SCM-05-2020-0207.
- Argote, L. (1999), *Organisational learning: Creating, retaining and transferring knowledge*. Norwell, Kluwer, MA.
- Berry, L. and Bendapudi, N. (2007), "Health Care: A fertile field for service research", *Journal of Service Research*, Vol. 10, No. 2, pp 111-122.
- Bovaird, T. Flemig, S. Loeffler, E. and Osborne, S. (2019), "How far have we come with co-production – and what's next?" *Public Money & Management*, Vol. 39, No. 4, pp. 229-232.
- Brass, D. (2003), "A social network perspective on human resources management", in Cross, R. Parker, A. and L. Sasson. (Ed.s) *Networks in the Knowledge Economy*, Oxford University Press, Oxford, UK.
- Breidbach, C.F., Smith, P. and Callagher, L. (2013), "Advancing innovation in professional service firms: Insights from the service-dominant logic", *Service Science*, Vol. 5, No. 3, pp.263-275.
- British Lung Foundation (2019), *Chronic obstructive pulmonary disease (COPD) statistics*. British Lung Foundation, London.
- Broekhuis, M. and Pieter van Donk, D. (2011), "Coordination of physicians' operational activities: a contingency perspective," *International Journal of Operations & Production Management*, Vol. 31, pp. 251-273.
- Burt, R.S. (1992), *Structural Holes: The social structure of competition*, Harvard University Press, Cambridge, MA.
- Burt, R.S. (2005), *Brokerage and closure: An introduction to social capital*, Open University Press, Oxford, UK.
- Carlile, P. (2002). "A pragmatic view of knowledge and boundaries: boundary objects in new product development", *Organisation Science*, Vol. 13, pp. 442-445.
- Carlile, P. (2004). "Transferring, translating and transforming: An integrative framework for managing knowledge across boundaries." *Organization Science*, Vol. 15, No. 5, pp. 555-568.
- Cohn, S., M. Clinch, C. Bunn, and Stronge, P. (2013), "Entangled Complexity: Why Complex Interventions are Just not Complicated Enough," *Journal of Health Services Research and Policy*, Vol. 18, No. 1, pp 40–43. doi:10.1258/jhsrp.2012.012036.
- Collins, R. (2017), *Hand-off communication: The weak link in healthcare*, available at

- <https://www.beckershospitalreview.com/hospital-management-administration/hand-off-communication-the-weak-link-in-healthcare.html> (accessed 20 December 2020).
- Condon, L. (2019). "How patient stories can improve health services around the world", *Health Expectations: An international journal of public participation in Health care and health policy*, Vol. 22, No. 5, pp. 837.
- Considine, J. Berry, D. Sprogis, S. Newnham, E. Fox, K. Darzins, P. Rawson, H and Street, M. (2019). "Understanding the patient experience of early unplanned hospital readmission following acute care discharge: a qualitative descriptive study", *BMJ Open*, e034728. doi:10.1136/bmjopen-2019-034728
- Coulter, A. and Ellins, J. (2006), *Patient focused interventions: a review of the evidence*, The Health Foundation, London.
- Creswell, J. (2007), *Qualitative Inquiry & Research Design choosing among five approaches* (2nd Ed.), Sage Publications Ltd, London.
- Currie, G., Burgess, N. and Hayton, J. (2015), "HR practices and knowledge brokering by hybrid middle managers in hospital settings: the influence of professional hierarchy", *Human Resource Management*, Vol. 54, No. 4, pp. 793-812.
- Currie, G. and White, L. (2012), "Inter-professional barriers and knowledge brokering in an organisational context: the case of healthcare", *Organisation Studies*, Vol. 33, No. 10, pp. 1333-1361.
- Davenport, T. and Prusak, L. (1998), *Working knowledge*, Harvard Business School Press, Boston.
- De-Graft Aikins, A. (2003), "Living with diabetes in rural and urban Ghana: A critical social psychological examination of illness action and scope for intervention", *Journal of Health Psychology* Vol. 8, No. 5, pp. 557-572.
- Eriksson, N.. (2017). "Hospital Management from a High Reliability Organizational Change Perspective: A Swedish Case on Lean and Six Sigma." *International Journal of Public Sector Management*, Vol.30, No1, pp 67-84.
- Evans, S. Douglas, I. Rawlins, M. Wexler, N. Tabrizi, S. and Smeeth, L. (2013). "Prevalence of adult Huntington's disease in the UK based on diagnoses recorded in general practice records", *Journal of Neurology, Neurosurgery & Psychiatry*, Vol, 84, No. 10, pp. 1156-1160.
- Fernandes, A., Spring, M. and Tarafdar, M. (2018), "Coordination in temporary organizations". *International Journal of Operations & Production Management*, Vol. 38, pp+.1340-1367.
- Fernandez-Mateo, I. (2007), "Who pays the prices of brokerage? Transferring constraint through price setting in the staffing sector," *American Sociological Review*, Vol. 72, No. 2, pp. 291-317.
- Gibbs, G. (2018). *Analyzing Qualitative Data*, Sage Publications Ltd., London.
- Gibbs, L. Kealy, M. Willis, K. Green, J. Welch, N. and Daly, J. (2007). "What have sampling and data collection got to do with good qualitative research?" *Australian and New Zealand Journal of Public Health*, Vol. 31, No. 6, pp. 540-544.
- Griffiths, C. Foster, G. Ramsay, J. Eldridge, S. and Taylor, S. (2007). "How effective are expert patient (lay led) education programmes for chronic disease?" *BMJ*, Vol. 334, pp. 1254-1256.
- Hargadon, A. and Sutton, R. (1997), "Technology brokering and innovation in a product development firm", *Administrative Science Quarterly*, Vol. 42, pp. 716-749.
- Heng, H. and M. Loosemore, (2013), "Structural holes in hospital organisations: Facilities managers as

- 1
2
3
4 intrapreneurial brokers in the tertiary health sector”. *Engineering, construction and architectural*
5 *management*, Vol. 20, No. 5, pp. 474-487.
- 6
7 Hinds, P. (1999), “The curse of expertise: The effects of expertise and de-biasing methods on predictions
8 of novice performance,” *Journal of Experimental Psychology*, Vol. 5, pp. 205-221.
- 9
10 Kaplan, S., Milde, J. and Cowan, R.S., (2017), “Symbiotic practices in boundary spanning: Bridging the
11 cognitive and political divides in interdisciplinary research,” *Academy of Management Journal*, Vol,
12 60, No. 4, pp.1387-1414.
- 13
14 Kaehne, A. Beacham, A. and Feather, J. (2018), “Co-production in integrated health and social care
15 programmes: a pragmatic model”, *Journal of Integrated Care*, Vol.26, No. 1, pp. 87-96.
- 16
17 Karlun, A. Sanne, J. Aase, K. Anderson, J. Fernandes, A. Fulop, N. Hoglund, P. Andersson-Gare, B.,
18 (2020). “Knowledge management infrastructure to support quality improvement: A qualitative study
19 of maternity services in four European hospitals”, *Health Policy*, Vol. 124, pp. 205-215.
- 20
21 Kellogg, K. Orlikowski, J and Yates, J. (2006), “Life in the trading zone: Structuring coordination across
22 boundaries in postbureaucratic organisations”, *Organisation Science*, Vol. 17, No. 1, pp 22-44.
- 23
24 Kellogg, K. (2014), “Brokerage professions and implementing reform in an age of experts, *American*
25 *Sociological Review*, Vol. 79 No. 5, pp. 912-941.
- 26
27 King, N. (1998), *Template Analysis* in G. Symon, & Cassell, C. (Eds.) *Qualitative Methods and Analysis*
28 *in Organisational Research*, Sage Publications Ltd., London.
- 29
30 King, N., (2004), *Using templates in the thematic analysis of text*, in C. Cassell, & G. Symon, (Eds.),
31 *Essential Guide to Qualitative Methods in Organisational Research*, Sage Publications Ltd., London.
- 32
33 Levitt, B. and March, J. (1988), *Organisational learning*, In Scott, W. and Blake, J. (eds) *Annual Review*
34 *of Sociology*, Annual Reviews, Palo, Alto. CA, pp 219-340.
- 35
36 Levy, O., Lee, H.J., Jonsen, K. and M.A. Peiperl, (2019), Transcultural brokerage: The role of
37 cosmopolitans in bridging structural and cultural holes, *Journal of Management*, Vol. 45, No. 2,
38 pp.417-450.
- 39
40 Lindsay, C.F., Kumar, M. and Juleff, L. (2020). “Operationalising Lean in Healthcare: The Impact of
41 Professionalism.” *Production Planning and Control* Vol. 31, No. 8, pp.29-43.
- 42
43 Liverati, E.G. (2017), “Separating, replacing, intersecting: The influence of context on the construction of
44 the medical-nursing boundary,” *Social Science & Medicine*, Vol. 172, pp.135-143.
- 45
46 Martins, L. and Kambil, A. (1999), “Looking back and thinking ahead: Effects of prior success on
47 managers’ interpretations of new information technologies”. *Academy of Management Journal*, Vol.
48 42, pp. 652-661.
- 49
50 May, N. (1995). “Qualitative research: Rigour and qualitative research”, *BMJ*, Vol. 311, p. 109.
- 51
52 Monge, P. and N. Contactor (2003), *Theories of communication networks*, Oxford University Press,
53 Oxford, UK.
- 54
55 Moolenaar, N.M. and Slegers, P.J. (2015), “The networked principal: Examining principals’ social
56 relationships and transformational leadership in school and district networks.” *Journal of Educational*
57 *Administration*, Vol. 53, No. 1, pp. 8-39.
- 58
59 NHS 10-year plan (2019), *The NHS 10-year plan: how should the extra funding be spent?* Department of
60 Health, London, UK.

- Ocloo, J. and Matthews, R. (2016), "From tokenism to empowerment: progressing patient and public involvement in healthcare improvement", *BMJ Quality and Safety*, Vol. 2, pp.626-632.
- Ocloo, J. Garfield, S. Franklin, B.D. and Dawson, S. (2021). "Exploring the theory, barriers and enablers for patient and public involvement across health, social care and patient safety: a systematic review of reviews", *Health Research Policy and Systems*, Vol. 19, No. 8. <https://doi.org/10.1186/s12961-020-00644-3>
- Perrow, C. (1994), "Accidents in high risk systems", *Technical Studies*, Vol. 1, pp. 1-38.
- Platt, J. Raj, M. and Kardia, S. (2019), "The public's trust and information brokers in healthcare, public health and research", *Journal of Health Organisation and Management*, Vol. 33, No. 7/8, pp. 929-848.
- Pols, J. (2014), "Knowing patients: Turning patient knowledge into science". *Science Technology & Human Values*, Vol. 39, No. 1, pp. 73-97.
- Quartz-Topp, J. Sanne, J and Postges, H. (2019). "Hybrid practices as a means to implement quality improvement: A comparative qualitative study in a Dutch and Swedish hospital", *Health Care Management Review*, Vol. 43, No. 2, pp 148-156.
- Richardson, S, and Asthana, S. (2006), "Inter-agency information sharing in Health and Social Care Services: The role of professional culture", *British Journal of Social Work*, Vol. 36, pp. 657-669.
- Shannon, C. and Weaver, W. (1949), *The mathematical theory of communications*, University of Illinois Press, Urbana.
- Soda, G., Tortoriello, M. and Iorio, A. (2018), "Harvesting value from brokerage: Individual strategic orientation, structural holes, and performance," *Academy of Management Journal*, Vol. 61, No. 3, pp.896-918.
- Spyridonidis, D. and Currie, G. (2016), "The Translational Role of Hybrid Nurse Middle Managers in Implementing Clinical Guidelines: Effect of, and upon, Professional and Managerial Hierarchies," *British Journal of Management*, Vol. 27, pp. 760-777. doi:10.1111/1467-8551.12164.
- Stake, R. (2005), *Qualitative Case Studies*. In N. K. Denzin & Y. S. Lincoln (Eds.), *The Sage handbook of qualitative research* (pp. 443-466). Sage Publications Ltd, Thousand Oaks, CA.
- Sy Diop, K. and Liu, E. (2020), "Categorization of case in case study research method: new approach", *Knowledge and Performance Management*, Vol. 4 No. 1, pp. 1-14. doi:10.21511/kpm.04(1).2020.01
- The King's Fund (2018), "*A year of integrated care systems: reviewing the journey so far*", The King's Fund, London. Available at: <https://www.kingsfund.org.uk/sites/default/files/2018-09/Year-of-integrated-care-systems-reviewing-the-journey-so-far-report-summary.pdf> (accessed 20 December 2020).
- Tritter, J. (2009), "Revolution or evolution: The challenges of conceptualising patient and public involvement in a consumerist world", *Health Expect*, Vol. 12, pp. 275-287.
- Vargo, S.L. and Lusch, R.F. (2017), "Service-dominant logic 2025", *International Journal of Research in Marketing*, Vol. 34, No. 1, pp.46-67.
- Wait, S. and Nolte, E. (2006), "Public involvement policies in health: exploring their conceptual basis", *Health Economic Policy Law*, Vol. 1, pp. 149-162.
- Waring, J., Currie, G., Crompton, A. and Bishop, S. (2013), "An exploratory study of knowledge

1
2
3
4 brokering in hospital settings: Facilitating knowledge sharing and learning for patient safety?" *Social*
5 *Science & Medicine*, Vol. 98, pp. 79-86. doi.org/10.1016/j.socscimed.2013.08.037.

6
7 Wikner, J., Yang, B., Yang, Y. and Williams, S. (2017), "Decoupling thinking in service operations: a
8 case in healthcare delivery system design," *Production Planning & Control*, Vol. 28, pp. 387-397.
9 doi:10.1080/09537287.2017.1298869.

10
11 Williams, S.J. and Radnor, Z. (2021). Moving from service to sustainable services: a healthcare case
12 study, *International Journal of Productivity and Performance Management*, doi.org/10.1108/IJPPM-
13 12-2019-0583

14
15 Yin, R. (2014), *Case Study Research: Design and Method* (5th ed), Sage Publications Ltd., Thousand
16 Oaks, CA.
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
41
42
43
44
45
46
47
48
49
50
51
52
53
54
55
56
57
58
59
60

Table 1. Interview participants

Participants	HD care network	COPD care network
Healthcare practitioners	5	20
Patients	2	10
Care givers	6	2

Table 2. Inclusion and Exclusion criteria for the selection of research participants

Inclusion criteria	Exclusion criteria
Male or female	Participants who are unable to consent for themselves
18 years of age or older	
Able to consent for themselves	
Caregiver or receiver (including relatives/carer) for the selected conditions	
Health professional involved in providing care within the selected care networks	

Table 3 Semi-structured Interview guide – patients and care givers

Interview questions	Links to theory/framework
1. When were you first diagnosed with your condition?	Experience and knowledge of condition
2. Can you describe your journey since you were diagnosed?	Understanding the research setting Brokering and knowledge/information sharing
3. Can you describe a typical day?	Understanding the research setting Brokering and knowledge/information sharing
4. Now how about a day when you have to go to the clinic or hospital?	Brokering and knowledge/information sharing
5. As you think about the journey since the time you were diagnosed, what has gone well for you so far on this journey? Can you give some examples?	Identify areas of good practice including brokering and knowledge/information sharing
6. What has not gone so well for you so far on this pathway? Can you give some examples?	Identify areas for improvement including brokering and knowledge/information sharing
7. Let me try to focus this a bit more: for the things you do, are there things that could be clearer, easier, or could work better?	Identify areas for improvement including brokering and knowledge/information sharing
8. For the things the health professionals do, are there things that could be clearer, easier or could work better? Are there some things you	Identify areas for improvement including brokering and knowledge/information sharing

1 2 3 4 5	wish they knew more about that are important to you?	
6 7 8 9 10	9. For the concentrated work that you and your health professionals do together, are there things that could be clearer, easier, or that could work better?	Identify areas for improvement including brokering and knowledge/information sharing
11 12 13 14	10. Is there anything else that you would like to see improved?	Identify areas for improvement including brokering and knowledge/information sharing
15 16 17	11. What information have you received about the journey/your condition?	Brokering and knowledge/information sharing
18 19 20 21	12. In what ways was the information helpful to you? To those others in your family or the others who support you?	Brokering and knowledge/information sharing
22 23 24	13. Could the information be improved?	Identify areas for improvement including brokering and knowledge/information sharing
25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60	14. Would you like to add any additional points or stress anything in particular?	

Table 4 – Semi-structured Interview guide – Healthcare practitioners

Interview questions	Links to theory/framework
1. Can you tell me a bit about your background - what specialties have you worked in?	Understanding research setting Experience and knowledge of condition
2. How long have you worked in this hospital/clinic/team?	Experience and knowledge of condition
3. When did you start working in this speciality?	Experience and knowledge of condition
4. Can you describe the [condition] care pathway/network and how this works for you, your colleagues (other organisations involved in the pathway/network) and your patients?	Understanding research setting Brokering and knowledge/information sharing
5. How well does the 'care pathway/network' currently work? Please give examples	Identify areas for improvement including brokering and knowledge/information sharing
6. How does the pathway fit with other guidelines (e.g. NICE or lay associations)?	
7. What documents are included in the pathway/network?	Brokering and knowledge/information sharing
8. Is the pathway multi-disciplinary? If so, how which disciplines and specialists are involved?	Brokering and knowledge/information sharing
9. If you are unclear about the pathway or a patient on the pathway what would you do? Who would you ask?	Brokering and knowledge/information sharing
10. Is the pathway delivering the expected /desired outcomes?	Identify areas for improvement including brokering and knowledge/information sharing
11. How could the design of the care pathway be improved?	Identify areas for improvement including brokering and knowledge/information sharing
12. How do patients and care givers respond to the care pathway?	Patient involvement, brokering and knowledge/information sharing
13. Who is the key decision maker for the care pathway?	Brokering and knowledge/information sharing
14. How involved are patients and their care givers in the care?	Patient involvement, brokering and knowledge/information sharing
15. How do you evaluate how well the pathway is working and whether it is delivering the care you expect?	Identify areas for improvement including brokering and knowledge/information sharing
16. How and why would you improve the pathway? Who would you involve? What approaches would you use?	Identify areas for improvement including brokering and knowledge/information sharing
17. Would you like to add any additional points or stress anything in particular?	

Table 5. Boundary management brokering capability of actors in two healthcare networks

Key themes/ Boundary Issues	COPD care network	HD care network	Boundary management	Brokering practices
Patient information accuracy and availability	If outside of GP opening times, then patient information less likely to be available. Some details may be available if attending local A&E department and/or chest outpatient clinics.	Unlikely data will be available to hospital staff unless previous admission. Majority of care provided in the community – poor integration of information with the acute (hospital) sector.	Syntactic (COPD) – need to increase capacity to process information Semantic (HD) – no common/standard approach available	Transferring information (COPD) Translating information (HD)
Knowledge of patient's condition	If frequent visitors to hospital clinics/ wards and GP surgeries – knowledge of patient conditions likely to be known by various health care teams. However, information may not be integrated across the various organisations/services. COPD is the second highest reason for unplanned admissions – increasing occurrence.	Rare illness estimated to be 6000-8000 cases in UK. Knowledge held by patient, care giver or specialist community team (not present in all areas of UK). Less likely to be known in hospitals due to limited cases. Some professionals may not see a HD case during or post training.	Syntactic (COPD) Pragmatic and Semantic (HD)	Transferring information (COPD) Translating information (HD) when some knowledge existed with both actors OR Transforming when only one actor had knowledge.
Information sharing	May occur via in-reach or out-reach specialist nurses or relies on discharge letter or discharge care bundle which instructs GP or specialist nurses on follow up.	Through expert patient (care giver) or multi-disciplinary team if in place otherwise information sharing unlikely to occur which may lead to the patient being missed or misdiagnosed (unless other family members already known to have condition). Multi-disciplinary specialised HD team link with wider public services – no defined common practice to follow. To some extent	Syntactic (COPD) Pragmatic (HD)	Transferring information (COPD) Transforming information (HD). Relies on patients/caregivers gaining interest of care providers to help then assess the knowledge being presented.

		relies on the development of individual knowledge of local services and relationships with contacts within the network.		
--	--	-------------------------------------------------------------------------------------------------------------------------	--	--

Source: Authors

Table 6. Types of relational knowledge within two healthcare networks.

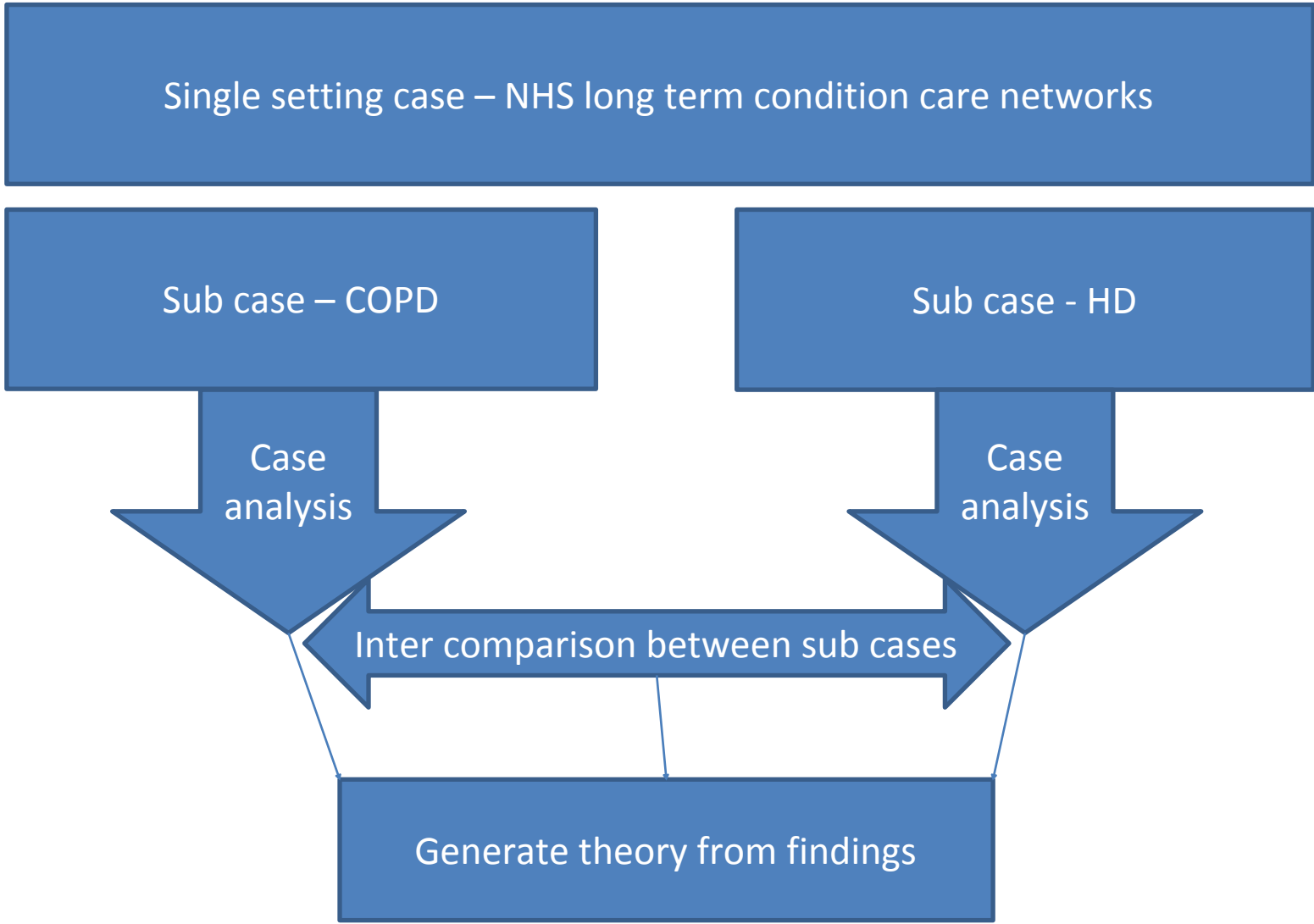
Types of relational knowledge	COPD network	HD network
Difference in knowledge	Knowledge difference less evident for COPD – but respiratory professionals will have more knowledge than general practitioners. Several of patient participants wanted to develop their knowledge of the condition for better self-management.	Due to rarity of HD knowledge difference often occurs between professionals and patients/care givers. HD specialists have more knowledge, whereas generalists likely to have less (or no) knowledge than patients/care givers
Dependence	Patients/care givers dependent on healthcare professionals for knowledge of condition. Often supplemented by other sources e.g. Internet	Initially patients/care givers dependent on specialist HD team – but as experience and understanding develops able to translate/transfer/transform knowledge this with non-specialist professionals.
Novelty	Due to the high occurrence levels of disease healthcare professionals (particularly respiratory specialist) frequently have the capacity and ability to share knowledge with other professionals across the COPD network and patients/care givers.	HD professionals and patients/caregivers have developed the capability to share knowledge with other actors across the HD network. However, the knowledge is sparse in the general community

Boundary Management

		Boundaries		
		Syntactic	Semantic	Pragmatic
Relational property of knowledge		Actors share common knowledge and lexicon	Actors negotiate and alter the knowledge interest from their domain	Actors develop common interests to provide a means of sharing and assessing knowledge
Broker capability		Information and knowledge transfer	Translating knowledge to create shared meaning	Transforming knowledge to create common interests and assess knowledge

Figure 1: Knowledge boundary management

Figure 2. Case study design



Adapted from Sy Diop and Liu (2020)

Figure 3. Actors involved in the two care networks

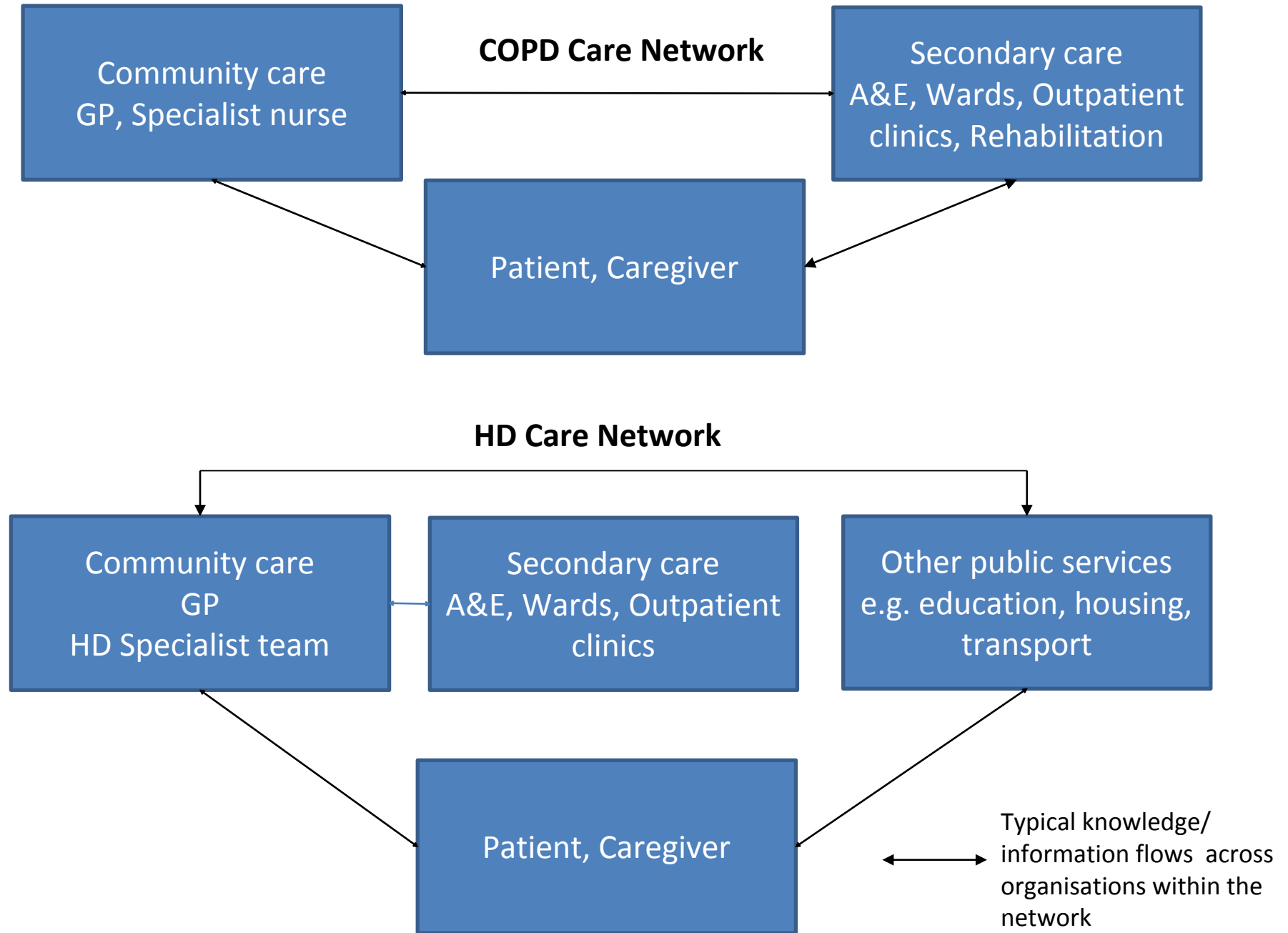
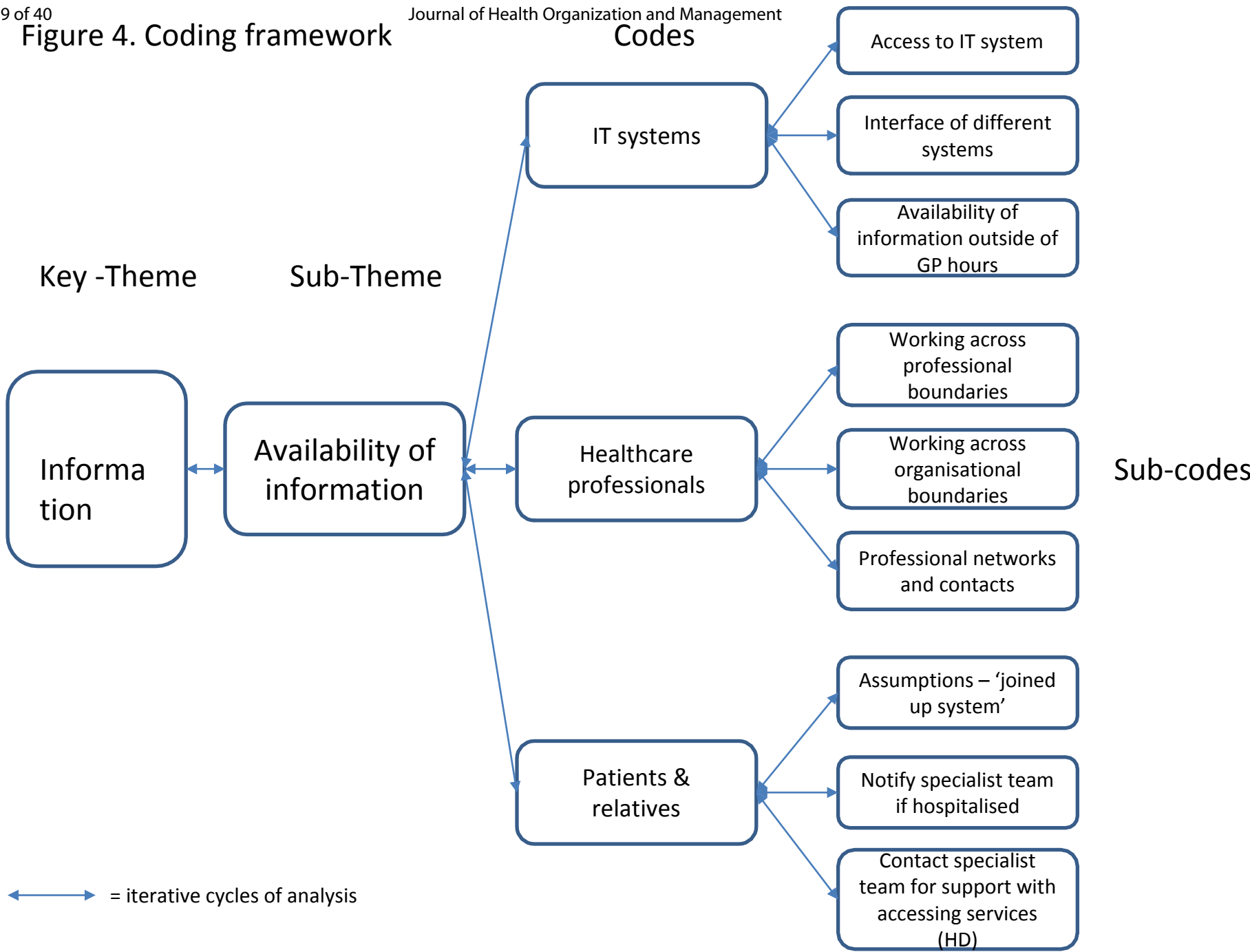


Figure 4. Coding framework



1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
41

Boundaries

Syntactic		Semantic		Pragmatic	
<p><u>Enablers</u></p> <ul style="list-style-type: none"> Establish common language and lexicons e.g. co-designed patient information 	<p><u>Disablers</u></p> <ul style="list-style-type: none"> Poorly integrated systems e.g. IT to support transfer of information. 	<p><u>Enablers</u></p> <ul style="list-style-type: none"> Specialists outreaching to other services Use of lexicons to translate information to other domains e.g. discharge letters 	<p><u>Disablers</u></p> <ul style="list-style-type: none"> Silo working Instability of services outside of the condition domain inhibiting the development of collaborative relations. 	<p><u>Enablers</u></p> <ul style="list-style-type: none"> Specialists outreaching to other services. Generalists identifying and outreaching to specialists. 	<p><u>Disablers</u></p> <ul style="list-style-type: none"> Resource constraints to establish collaborative relations outside of condition domain.
<p>Support for patients/ caregivers to act as brokers to present knowledge/ information – ability to be heard.</p> <ul style="list-style-type: none"> Willingness to receive and value information from all actors 	<ul style="list-style-type: none"> Not recognizing the value of the information and importance of knowledge transfer. Patients limited knowledge of own condition may struggle to transfer to a common lexicon e.g. terminology Freedom to transfer constrained by external factors. 	<ul style="list-style-type: none"> Willingness to receive and value information from all actors Formally recognizing and supporting the legitimate role and power of brokers operating at and across boundaries e.g. patient/ caregiver groups. 	<ul style="list-style-type: none"> Limited capacity and capability to translate knowledge to various actors e.g. Links between acute A&E teams and specialist teams in the community. Freedom to translate constrained by external factors 	<ul style="list-style-type: none"> Willingness to receive and value information from all actors. Collaborations across all actors to recognizing and develop the legitimate role and power of brokers operating at and across boundaries. E.g. Patient’s knowledge of condition. 	<ul style="list-style-type: none"> Limited capacity and capability to transform knowledge to various actors. E.g. A&E’s limited exposure to rare conditions such as HD. Freedom to transform constrained by external factors.

1
2
3
4
5
6
7
8
9
10
11
12 Relational property
13 of knowledge
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28 Broker Capability
29
30
31
32
33
34
35
36
37
38
39
40
41