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Abstract

Purpose – The purpose of this paper of inter-professional networks is to analyze the evolution of relationships between professional groups enacting new forms of collaboration to address clinical imperatives.

Design/methodology/approach – This paper uses a case study based on semi-structured interviews with physicians and nurses, document analysis and informal discussions.

Findings – This study documents how two inter-professional networks were developed through professional agency. The findings show that the means by which networks are developed influence the form of collaboration therein. One of the networks developed from day-to-day, immediately relevant, exchange, for patient care. The other one developed from more formal and infrequent research and training exchanges that were seen as less decisive in facilitating patient care. The latter resulted in a loosely knit network based on a small number of ad hoc referrals while the other resulted in a tightly knit network based on frequent referrals and advice seeking.

Practical implications – Developing inter-professional networks likely require a sustained phase of interpersonal contacts characterized by persuasion, knowledge sharing, skill demonstration and trust building from less powerful professional groups to obtain buy-in from more powerful professional groups. The nature of the collaboration in any resulting network depends largely on the nature of these initial contacts.

Originality/value – The literature on inter-professional healthcare networks focusses on mandated networks such as NHS managed care networks. There is a lack of research on inter-professional networks that emerged from the bottom up at the initiative of healthcare professionals in response to clinical imperatives. This study looks at some forms of collaboration that these "grass-root" initiatives engender and how they are consolidated.

Keywords Health care, Roles, Professional boundaries, Power relations, Clinical collaboration, Inter-professional networks

Paper type Research paper

Introduction

The prevalence of multi-morbidity and the fragmentation of healthcare are associated with challenges for managing cost, safety and quality of care. New forms of collaboration across professional boundaries are becoming necessary to care effectively

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for patient with complex conditions such as those involving multi-morbidity. For this, networks can help develop collaborative ties between different groups of professionals. Networks are characterized by repeated, enduring exchange relationships between its members (Podolny and Page, 1998; Cunningham *et al.*, 2012). As opposed to markets or hierarchies, they often depend on cooperative social connections based on trust, interdependence and reciprocity (Powell, 1990; Aveling *et al.*, 2012). Networks help to create horizontal links between participants and to overcome organizational and professional boundaries. They can facilitate the coordination of resources (Cropper *et al.*, 2002), harnessing collective action, disseminating knowledge and promoting learning (Aveling *et al.*, 2012). The terms networks, communities and collaboration are often used interchangeably in the healthcare literature (Aveling *et al.*, 2012; Cunningham *et al.*, 2012). In this study, we use the term inter-professional network to refer specifically to a form of collaboration in their practice between individuals from different professional groups to address a clinical imperative. To improve healthcare delivery, considerable resources are invested to develop inter-professional networks. However, these investments are often ineffective because the networks either fail to emerge or are short-lived. Forming and sustaining inter-professional networks is a challenge in healthcare (Bate, 2000; Southon *et al.*, 2005; Cunningham *et al.*, 2012; Currie *et al.*, 2012). This relates in part to occupational boundaries that insulate professional groups from each other (Abbott, 1988; Bate, 2000; Ferlie *et al.*, 2005; Chreim *et al.*, 2012).

The focus of the literature on inter-professional healthcare networks has been on studying networks that are mandated or managed from the top down such as managed care networks from NHS and QI collaboratives (Goodwin *et al.*, 2004; Addicott and Ferlie, 2007). There is a scarce amount of research on inter-professional networks that emerged from the bottom up at the initiative of healthcare professionals in response to clinical imperatives. Through a case study, this study identifies mechanisms underlying the formation and consolidation of this type of "grassroots" inter-professional networks. This type of inter-professional networks has received relatively little research attention. The studies on managed/mandated networks mostly deals with professionals resisting the imposition of networks across professional boundaries. In contrast, there is a relatively small amount of literature on social networks that have developed over time to link different professional groups who can work together to improve patient care. This paper adds to this literature by identifying and contrasting two cases of network development and consolidation efforts in cancer care. Instead of a focus on professionals' response to mandates or top down interventions for inter-professional networks, this paper focusses on professionals' initiatives in inducing new modes of collaboration to meet challenges in the production of care.

We studied the development of networks between professional groups involved in caring for older cancer patients: cancer specialists, geriatricians and nurse navigators. Older cancer patients sometimes present complex clinical pictures (comorbidity, polypharmacy, functional status and geriatric syndromes such frailty and dementia). They make up a highly heterogeneous population, often in need of a personalized approach to care. In addition to cancer specialists, other professionals such as geriatricians and nurses sometimes have to be involved to identify the health issues of these patients and undertake interventions adapted to their functional status, comorbidity, cognitive, psychological (depression), nutritional, medication and social support. Geriatricians can facilitate the assessment of vulnerable older patients and

improve treatment outcomes through a comprehensive assessment of a patient's condition and interventions to help address co-morbidities such as geriatric syndromes (Extermann, 2010). Nurse navigators are also involved by a growing number of cancer treatment centers to improve services provided to older patients. They provide care planning, patient/family education, referrals, coordination of resources and support systems and monitoring of services at different points along the care trajectory (Jennings-Sanders and Anderson, 2003; Economou *et al.*, 2012). Together, cancer specialists, geriatricians and nurse navigators can each play a role in facilitating cancer care adapted to vulnerable older patients. Because of their complementarities, they have an opportunity to form inter-professional networks. Working together, they can help to better evaluate, treat, follow up and rehabilitate these patients (Extermann *et al.*, 2011). The development of a network between these professionals in a large hospital provided us an interesting case for studying inter-professional networks. In the remainder of this paper, we present the method used in this study followed by the findings. The paper ends with a discussion.

Inter-professional networks in healthcare

Inter-professional networks have been studied in the context of healthcare organizations. They include referral, advice and program networks. Referral networks involve independent practitioners referring patients to colleagues with the appropriate expertise. Program networks involve groups of healthcare professionals who share responsibilities, refer patients to each other, jointly manage care and collaborate over complicated cases such as in cancer care). Advice networks involve healthcare professionals who exchange advice (Southon *et al.*, 2005). The literature documents abundantly that the relations between different professional groups typically stand in the way of building networks. Healthcare organizations often consist of silos of professional turfs (Abbott, 1988) that inhibit inter-professional interaction and collaboration (Currie *et al.*, 2012; Locket *et al.*, 2012). Status gaps such as between nurses and doctors and the tendency of professionals to build advice and communication ties with members of their own groups are the main inhibitors (Abbott, 1988; Aveling *et al.*, 2012; Tasselli, 2014). Any effort to facilitate inter-professional networks usually meets significant challenges. For example, Bate (2000) analyzed the transformation of a hospital from a rigid hierarchy based structure into a new more flexible and collaborative arrangement between different groups. He notes that the transformation required a culture change that cannot be imposed from the top down but rather involves interactive boundary work from the parties concerned. He explained that:

> Allegiances to one's profession were far too strong ever to conceive of a single dominant hospital culture; it was not therefore a question of doing away with the different tribes but of finding sensible and realistic ways of linking them together and improving communication and knowledge exchange (Bate, 2000, p. 503).

There is scare literature on means that bring about inter-professional networks from the bottom up in healthcare. The available literature shows that they are developed and sustained through the day-to-day social interactions to provide a clinical service. A few studies illustrate how social interactions and organizational arrangements influence the development and the sustaining of these inter-professional networks. For example, an ethnography in an intensive care unit found that rituals such as nursing reports and physician rounds facilitated nurse-physician interactions and more involvement of nurses

in patient care decision making (Chase, 1995). Other studies show that some organizational contexts may also contribute to informal mechanisms of inter-professional networking. For example, multidisciplinary training programs that facilitate inter-professional interactions (Boyer *et al.*, 2010; Mascia *et al.*, 2011) and the presence of opinion leaders (Creswick and Westbrook, 2007) were found to help create strong network ties across professional boundaries. This papers contributes to this small but growing body of literature documenting day-to-day social interactions that overcome professional boundaries and professionals' initiatives in building inter-professional networks.

Method

This paper is based on a case study. A case study enables a researcher to draw from multiple sources of information and to develop a rich understanding of the phenomenon under study (Yin, 1994). This research approach is best suited considering our aim to study the development of a web of relationships between several professional groups over a period of time. The available data were collected using semi-structured interviews, document analysis and informal discussions. The interviewees were healthcare professionals who were selected according to their involvement in treating older cancer patient and their availability. They were a purposeful sample of twenty two physicians, and nurses: four surgeons, two radiation oncologists, two medical oncologists, one hematologist, one gynecology oncologist, four geriatricians and nine nurse navigators. The physicians were interviewed individually while interviews with nurses sometimes included up to two nurses. From the literature on inter-professional relations in healthcare, we identified key concepts to guide our interviews. The concepts were professional boundaries, healthcare delivery for co-morbid conditions, inter-professional collaboration and the role of personal and organizational resources in facilitating collaboration. These concepts anchored the interviews. In the following order, the interviews inquired about the challenges of caring for older cancer patients, the evolution of care delivery at the cancer treatment center since 2006, the nature of the relationship between professionals and the ways/factors by which it evolved over time. The interview guide was tailored for each of the three groups of professionals interviewed. That is, there was a distinct interview guide for cancer specialists, geriatricians and nurses. The cancer specialists were asked about how they care for their older cancer patients. They were also asked about the nature and evolution of relationships with other practitioners who are involved with their patients. Geriatricians were asked about their initial involvement in cancer care for older patients. They were also asked about the nature and evolution of their relationships with cancer specialists and its evolution. Nurses were also asked about their role in the care of older cancer patients, and the nature and evolution of their relationships with other practitioners who are involved in the cancer care. The wording of the interview guide was formulated through several iterations based on discussions involving the entire research team. This process helped to have interview questions adapted to our research objectives and ensure that questions' wording was neutral and not value-laden. The interviews proceeded by asking interviewees general questions at the beginning. When needed, more specific questions were asked to probe additional details.

Data analysis

We used analytic induction (Patton, 2002). This method allows researchers to be guided by key concepts identified prior to collecting data and analyzing it. It also allows new

insights to emerge over the course of the data collection and analysis. In other words, in analytic induction, "researchers develop hypotheses, sometimes rough and general approximations, prior to entry into the field or, in cases where data already are collected, prior to data analysis. These hypotheses can be based on hunches, assumptions, careful examination of research and theory, or combinations. Hypotheses are revised to fit emerging interpretations of the data over the course of data collection and analysis" (Gilgun, 1995, pp. 268-269). We deemed this method most adequate for this study because we had a priori concepts to help guide our research and a new context from which new insights could be gained. The interview transcripts were coded with open coding to identify the different themes (Miles *et al.*, 2013) across the interviews. Sub-codes were added as the coding progressed and as we saw the need for finer distinctions between concepts. Codes with the same content and meaning were then grouped into categories (axial coding) (Miles *et al.*, 2013). This allowed us to identify various factors and mechanisms involved in inter-professional networks' formation and consolidation (or lack thereof). Through selective coding (Miles *et al.*, 2013), patterns were analyzed. This involved coding the transcripts based on patterns identified through analyzing results of the open coding. Finally, we grouped these new codes into a smaller number of categories to develop an overarching understanding of the formation and consolidation process of the inter-professional networks studied.

Findings

The cancer treatment center of the hospital that we studied conducts more than 50,000 visits per year and received several thousand new patients in 2011, for example. Shortly after it became a comprehensive cancer center where all the cancer care services where collocated, a geriatric oncology clinic was created in the same building and was staffed by geriatricians with a mandate to help cancer treatment teams with handling their older patients. This clinic was meant to develop geriatricians' collaboration with cancer specialists. Cancer specialists referred about 500 patients to geriatricians through the clinic since its creation. Patients of the clinic are on average 80 years old, have an "active" cancer diagnosis and a suspected vulnerability to adverse effects of cancer treatment that geriatrician can help address. In addition to the new relationships geriatricians were working to build with cancer specialists, new nursing roles were introduced in cancer care. Around the time of its opening, the comprehensive cancer treatment center recruited nurse navigators for each of its tumor treatment units. These nurses also worked to build ties with cancer specialists and develop a collaboration with them.

Overall, these changes in the hospital gave way to different variants of inter-professional networks. Cancer specialists and geriatricians went from a situation in which each group had nearly no exchange to a situation in which geriatricians were sought by certain cancer specialists to help care for their patients. Likewise nurse navigators went from being new players with little legitimacy in cancer care to being relied on by cancer specialists for much of care continuity and psychosocial support to patients. Two noteworthy networks emerged in this context: geriatrician-cancer specialist network and nurse navigator-cancer specialist network. Neither of the two networks had a formal and structured collaboration framework. They lacked an authority to coordinate among the different groups of professionals and provide leadership. There was no formal framework guiding cancer treatment teams in identifying patients whose evaluation required geriatrics or nursing expertise.

There was no consensus between the professionals about priorities, no systematic protocols and no clear roles in dealing with conditions requiring collaboration. Boundaries were blurred and negotiated around disparate interpretation of which of the three groups are to be in charge of certain assessments, psychosocial support and managing frailty for older patients. Despite these common characteristics, the two networks represented significantly different forms of collaboration. This study identifies mechanisms that helped form the two networks and how they shaped the resulting forms of collaboration.

One of the networks developed into a small loosely knit group tied by occasional referrals while the other grew into a tightly knit group tied by frequent referrals and advice seeking. As for the former, geriatricians initiated research and training relationships with cancer specialists, which facilitated ties that moderately changed the collaboration between the two groups. This evolution was reflected by a relatively small number of recurrent referrals from a few cancer specialists to geriatricians and a sensible increase of the number of referring cancer specialists. As for the other network, nurse navigators undertook day-to-day tactful initiatives to show how they can help improve cancer care. It resulted in a significant shift in the way cancer specialists related to them. Indeed, the nurse navigators were relied on considerably and their advice was increasingly applied in the care delivery. To induce collaboration with cancer specialists, the two groups relied on two different types of "light touch," non-directive approaches: a more academic one (research, presentations, etc.) and a more political one (persuasion, trust building, etc.). The nurses were more successful in their efforts, which shows that the more political approach was more effective. Next, we discuss these observations in more details for each network.

The geriatrician-cancer specialist network

This network was initiated from geriatricians engaging cancer specialists through training and research activities. The research activities were possible because of the leadership of director of geriatric medicine and a funding that he obtained for a large project about frailty and its consequences on health and cancer treatment. The project was an occasion for a surge of academic attention to the relationships between cancer and aging. It launched several studies on frailty and cancer, which provided the occasion for the first conversations between cancer specialists and geriatricians. The efforts to convince cancer specialists to join these studies resulted in enrolling a few cancer specialists. Around the same time, geriatricians took another initiative to be involved in cancer treatment and exchange with cancer specialists. They set up a geriatric oncology fellowship, which involved mostly geriatricians training through rounds at the different cancer treatment units. It was attended by a handful of geriatricians and facilitated the interactions between the two groups of professionals. Finally, geriatricians set up the geriatric oncology clinic to formally offer services for cancer patients. The research and training activities significantly contributed to attract referrals to the clinic and helped initiate changes to the way these two groups of professionals relate to each other.

They created a space for information sharing and helped relationships to develop between the two groups. A radiation oncologist who frequently refer patients to geriatricians suggested that both the research and training activities that introduced him to the services that geriatricians offered. First, this began with a geriatrician who provided him with synopsis of the studies on cancer and aging to invite him to join the

studies. It continued with interactions through rotations afforded by the geriatric oncology fellowship:

> Well a few years ago we had a fellow […] who was doing a fellowship in geriatric oncology here. […] She spent time here. She gave us like a synopsis of her project and then after that, Dr [X] rotated with me and then Dr [Y] […]. [Hence] I was made aware specifically of the geriatric oncology programs.

Likewise, the nurse navigator from the geriatric oncology clinic explained that a geriatrician's interactions with gynecological cancer specialists through the geriatric oncology fellowship help build ties between geriatricians and these cancer specialists:

> A big part of the gyne[cology]-onc[ology] relationship [with our clinic] comes [from ties built through one of our geriatricians] because I think she spent a good amount of time with the gyne-onc team [for her fellowship].

In the same vein, a research fellow who helped geriatricians conduct the research studies on aging and cancer explained that the cancer specialists who showed interest in the studies ultimately were open to referring their patients to geriatricians:

> [As for the cancer specialists whom we approached for research collaboration], I think some were more open to it than others. […] After interacting with us for the research project] there is probably certain physicians who refer always and other physicians you never receive a referral from because they don't seem to think that it has a benefit for the patient.

Out of all the cancer treatment teams, the gynecology oncology cancer treatment unit showed the most interest in working with geriatricians. The unit was in process of implementing a new treatment procedure for its older patients. Working with geriatricians was a perfect opportunity to help evaluate this procedure. As a geriatrician explained, the relationships with this team closely matched the network that they sought to build with cancer specialists:

> So we're working on a few small research projects with gynecology oncology. So I think it's a win-win for both teams where we collaborate clinically and, and we can be productive in research. Because for them too, it's a lot of. Looking at older cancer patients in general is, in many of the different tumour sites, it's uncharted territory. You know it's still [new], there's not much publication out there. Robotic surgery for older ladies with endometrial cancer, this is relatively new. We're one of the few hospitals or centers across the country who do robotic surgery apparently. I don't know anything about surgery, but when you look for publications in the gynecology oncology literature, there's not much about older women undergoing robotic surgery. So, so for us to, for them to have data about you know pre-op data, about full CGA and then post-op data, and it's one of the studies that's going to be published, we're are going to be submitting, this is novel you know this is new in the literature. So I think it's great, it benefits the patients [and] it's productivity in research for both disciplines.

Not all cancer specialists were as responsive as the gynecology oncologists. In fact, some of them were not. One of geriatricians who led many of the research and training initiatives explained that there was little interest from cancer specialists in initiatives that were meant to bring them together to eventually better work together on issues at the intersection of their respective disciplines:

> [Our efforts were led by] a small but relatively dynamic group. [There was] not much, not much implications except moral support from oncology. Not much. So for example we would organize a special round with a visiting speaker from Toronto. We have grand medical round

> on this. No one from oncology shows up. We've been asking for [help with patient] recruitment among oncologists interested in [research about] older persons. There's hasn't been much concrete support. There's been moral support but not much concrete support.

Taken together, geriatricians' efforts to build a network with cancer specialists treating older patients provided opportunities for boundary spanning and social connections. For the geriatricians who initiated the network, the strategy was to create an interest in learning and sharing knowledge on topics at the intersection of oncology and geriatrics. This in turn was meant to encourage the two groups to work together. The learning and the ties were to build a network that would result in research outputs and referrals from cancer specialists to geriatricians. However, the network hardly met these expectations. Geriatricians explained that these unmet expectations are largely due to their lack of legitimacy from the perspectives of cancer specialists. One of them explained that having a champion who is a cancer specialist would help in this regard:

> We have this you know big challenge to get the oncologists on board. So we don't have an oncologist that's part of our team. You know as physicians [pushing for a network between geriatricians and cancer specialists], we're all geriatrics from the geriatric division. We're actively looking for a medical, certified medical oncologist to officially be part of the team so we can you know promote this collaboration and, and get oncology on board.

Another geriatrician echoed this view that champion from oncology was needed to develop ties with cancer specialists:

> It would take recruiting an academic oncologist with a strong interest in geriatric oncology or what I call oncology in older persons. Which is becoming as a field, becoming extremely important, academically and clinically field across- not in Canada very much- but in Europe, in France. In France the meetings on oncology in older persons attracted five hundred physicians, geriatrician oncologists. Here if I do a meeting like that in Canada, I would get about ten people. So it, it takes somebody from the oncology side. If it comes from our side it's from the geriatric side. It's not in oncology side [that we] have commitment.

At the beginning of their initiative to build a network with cancer specialists, geriatricians had relative success in facilitating interactions that promoted their services. Over time, the research initiatives receded as the initial research projects remained embryonic and inconclusive. Likewise, the training program hardly attracted any fellows after its first few years. In a nutshell, the initial period of geriatricians vigorously engaging cancer specialists in knowledge sharing and tie building slowly faded to give way to occasional referrals from cancer specialists who have come to appreciate the work of geriatricians. When this study was coming to an end, the network was being slowly revived with the help of nurse navigators who encouraged cancer specialists to refer to geriatricians and an increasing number of surgeons who rely on geriatric assessments for their decision-making.

Nurse navigator – cancer specialist network

As in the case of the abovementioned network, the initiative of this network did not come from cancer specialists. For each cancer treatment unit, the ties that the nurse navigators built with cancer specialists (each unit had at least four specialists) were at their initiative. Unlike geriatricians who relied on relatively formal interactions around research and training opportunities, nurse navigators relied on an informal and tactful approach involving frequent spontaneous interactions to build and consolidate the network. Their main strategy was show that they can help and be trusted in dealing

with psychosocial care. It involved consistently seizing opportunities to offer their services to cancer specialists and to work to slowly gain their trust. A colorectal cancer nurse explained that when she first started in her role, she engaged in a long process of conditioning cancer specialists to rely on her for some of the care of their patients. It took many informal services to build trust and a constant re-affirmation of what she could bring to improve patient outcomes. Likewise, a radiation oncology nurse navigator explained that her role and views started to become valued after she demonstrated that she could help improve psychosocial care and patient outcomes. She related the following:

> We're kind of a medium size team. There's like 6 radiation oncologists. I think there's a lot of respect because they really are able to recognize you know that we do our best nursing. They recognize the impact on the patients. They're very supportive of you know us advancing knowledge or you know if I come with an article and say, "Look you know I saw this in skin care and we're not doing evidence based practice, could we try this?" They're very open in hearing suggestions or changes or working together as a team. They'll say, "Let's try this and we'll see how it goes."

Another nurse navigator whom cancer specialists relied on considerably to help care for their vulnerable patients suggested that her skills in helping these patients improved her legitimacy among cancer specialists and was reflected their practice. She explained that she played a key role in improving the delivery of psychosocial care:

> [I coach and assist the cancer specialists a lot] especially in the way they talk and what they think about with cancer patients. I see that they're changing, I see where the doctors take more time and explain to them, to make sure they get the questions answered […] And also being aware of, of the needs of patients after treatment: fatigue, return to work, pain management. Knowing that they aren't the experts in managing cancer pain and accepting to collaborate with the pain, palliative service [I encourage them] to have those doctors work with the patients. That's a change, they've, we've introduced that since I came in.

The nurse navigators often had to resort to diplomacy to change some of the practices of the cancer specialists. As illustrated by the following quote, they adapted their way of offering advices to particularity of each cancer specialist:

> You have to learn how you're going to approach different people. You know if I use the same approach across the 6 radiation oncologists, it wouldn't necessarily work. So you tailor based on you knowing who they are and having worked here for quite a bit of time. […] Some doctors take our advice and others are challenged. Not everybody likes being challenged so it's sometimes a technique, like I said you have to, know how are you going to work about it or how are you going to try to bring it back to the patient: "it"s not necessarily, it's not you or your practice I'm questioning, it's what we're doing for the patient". So you have to, it's the communication, it's the language you use sometimes in trying to improve and move things along.

In the various cancer treatment units, the nurse navigators and cancer specialists had developed a relationship of trust, which consolidated the relationship between the two professions. In this regard, one nurse stated that trust was the driver of their collaboration with cancer specialists:

> There's trust, for example when a patient call complaining of a side effect let's say from surgery, like the doctors like they do trust us because of this working collaboration that we have. They will say well you know what, go ahead, yes it's fine to [consult] the nurse first and according to her finding she could report to me and from there I can continue. […] So they do

> trust our judgment, they do trust like, so it's more, like yeah there's a collaborative trust working between us. And, you know once they get to know you, […] they would want that the patient be assessed first by us.

Interestingly, nurse navigators' influence included facilitating referrals from cancer specialists to geriatricians. They were helping this other network grow as geriatricians struggled to attract more referrals from cancer specialists. A geriatrician explained that nurses help influence many decisions to refer patients to them:

> Sometimes a lot of those referrals come via the nurses, it's the nurses, I mean ultimately the doctor has to write the consult. […] But sometimes the consults are initiated by the nurse who will tell the physician, "You know I think this patient should be seen at geriatric oncology." And the physician will sign the consult. So I think the nurses play a key role because they're really more one-on-one with the patient they're, you know at a more, closer level, where they have, more interactions with the patients. So they will, they are able to detect you know problems or potential problems and, and refer the patients.

In summary, the nurse navigators managed to gradually establish a network in which cancer specialists not only referred patients to them or work directly with them but also took advice from them for improving care. Theirs was a gradual process of trust building and small wins in changing cancer specialists' approach to psychosocial care and the role nurse navigators can play in it. The nurse-cancer specialist network resulted from day-to-day immediately relevant and useful exchange. In contrast, geriatricians' attempts to engage these specialists in forming an inter-professional network relied on more formal exchanges that were less frequent and less decisive in facilitating patient care from the cancer specialists' perspective. It resulted in participation with differing level of interest and commitment from cancer specialists. All in all, there was no significant breakthrough in changing cancer specialists' practices in relation to geriatricians beyond a relatively small number of ad hoc referrals from cancer specialists to geriatricians (Figure 1).

Overall, we found that the influence of professional status was important in the development of networks. For both networks, their development involved other professional groups trying to create opportunities to connect with cancer specialists. All the clinicians saw some potential for a network to improve clinical care and service delivery. However, there was an asymmetry in commitment: the cancer specialists were more inclined toward keeping the status quo. In this context, we observed that in the absence of support from powerful actors (e.g. dominant professional groups, government that can impose mandates), the formation of a network had to involve a sustained phase of intense interpersonal contacts characterized by persuasion, knowledge sharing, skill demonstration and trust building from the less dominant group.

Discussion

This study of inter-professional networks analyzes the evolution of relationships between professional groups enacting new forms of collaboration to address clinical imperatives. It uses the case of the organization of care for older cancer patients to understand mechanisms underlying the formation and consolidation of these networks. Older cancer patients generally have many co-morbidities, precarious social situation and health deficits (Extermann, 2010). Caring for them can mobilize inter-professional networks to a great extent (Nies, 2004). The two networks that we studied depended entirely on professionals' initiative to work together to address problems occurring at

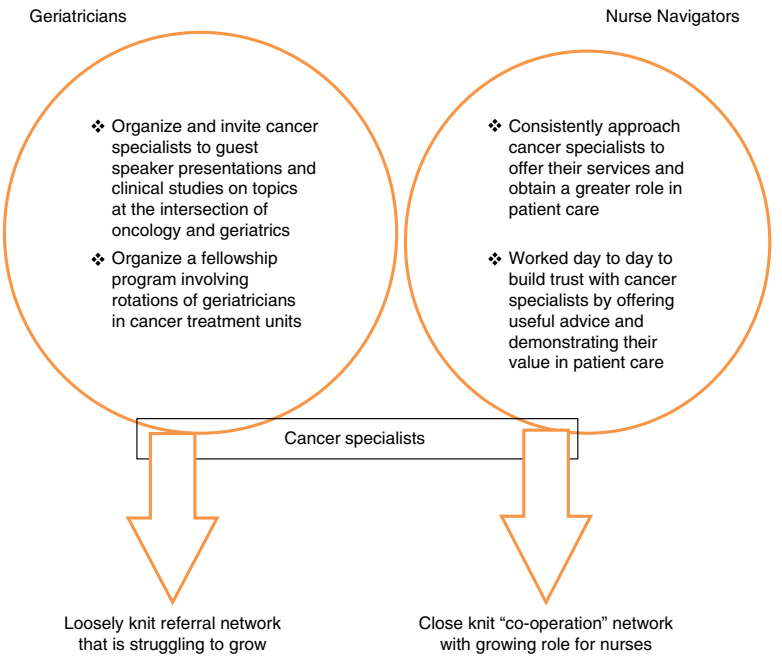

Figure 1.
Two different approaches to network development

the interface of their respective disciplines. They translate into qualitatively different forms of collaboration but they both rely on spontaneous and unstructured exchanges. They are neither mandated nor facilitated from the top down nor managed. Also, they do not follow any formal protocols. This type of inter-professional networks has received relatively little research attention compared to the large body of literature that discusses networks that are mandated or managed from the top down such as managed networks from NHS and QI collaboratives (Goodwin *et al.*, 2004; Addicott and Ferlie, 2007). Instead of a focus on professionals' response to mandates or top down interventions for inter-professional networks, ours is a focus on professionals' initiatives in developing inter-professional networks. The literature on inter-professional networks mostly deals with professionals resisting the imposition of networks across professional boundaries (e.g. resistance to NHS managed networks). Our study contributes to a small amount of empirical literature on "grassroots" networks that have developed over time to link different professional groups who can work together to improve patient care. It brings a focus on the essential day-to-day role that professionals play in shifting the organization of professional work toward network-based forms. Both networks studied were developed through micro actions that influenced work interactions and practices. They resulted from professional agency by way of professionals' participation in research, positive work interactions, day-to-day actions to influence habits and opinions.

Our findings show that the means by which networks are developed influence the form of collaboration that they result in. Formal means that failed to build trust and to provide frequent interactions and immediately relevant input to patient care led to a loosely knit network based on a relatively small number of ad hoc referrals from cancer specialists to geriatricians. In contrast, trust building, frequent interactions and clearly

relevant help and advice led the way to a relatively tightly knit network based on more frequent referrals and advice seeking from cancer specialists to nurse navigators. Our findings is in line with previous research that highlight the importance of trust and relationship building in network formation and consolidation (Goodwin *et al.*, 2004; Aveling *et al.*, 2012). As in previous research, they underscore the importance of persuasion and ongoing discussion in this regard and the role of competing priorities in undermining collaboration (Goodwin *et al.*, 2004; Aveling *et al.*, 2012). Our findings confirm the importance of interaction and communication including informal socializing in network development (Aveling *et al.*, 2012; Hewitt *et al.*, 2015). Another important findings of this study, which is supported by previous research is the influence of professional hierarchy in social and clinical processes in healthcare institutions (e.g. Addicott and Ferlie, 2007; Currie *et al.*, 2008; Aveling *et al.*, 2012). Less powerful groups of clinicians (e.g. nurses, geriatricians) have to exert a lot of efforts to engage more powerful groups. They are generally credited with little legitimacy by more powerful counterparts and have to work hard to overcome their marginalization even when collaboration is evidently necessary for better clinical outcomes.

Also, our analysis suggests that knowledge sharing had an important influence on inter-professional network development. Physicians contribute to occupational boundaries that insulate them from other professional groups and hamper collaboration (Ferlie *et al.*, 2005; Chreim *et al.*, 2012). In this study, knowledge sharing was the way to build legitimacy for the less powerful professional groups and dilute occupational boundaries. As we noted earlier, the nurse navigators tried to engage cancer specialists in jointly finding and implementing solutions to improve psychosocial care. The nurses experienced a number of small success in this endeavor. For example, they provided insight on helping patient with head and neck cancer with body image and on improving skin care for radio-oncology patients. This knowledge sharing enhanced their ties with cancer specialists and contributed to enhance the legitimacy of their role. The geriatrician-initiated research and training activities also facilitated knowledge sharing and set the stage for the two professions to work together. It did not lead to significant practice change beyond some referrals from cancer specialists. Nonetheless, the initial interactions between the two groups were characterized by many initiatives for learning and knowledge sharing, which sowed seeds for helping them to get to know each other.

Lastly, this study illustrates some of the advantages of networks in healthcare. We observed that the two inter-professional networks set the stage for a rather responsive organizational form for caring for older patients. Looking globally at the web of relationships involved in caring for older cancer patients, the two networks are part of an organizational form that is akin to a "hub and spoke" model of care. This model provides for the transfer of patient care and treatment from central players, which are the cancer specialists to peripheral players, which includes geriatricians and nurse navigators – at the discretion of cancer specialists. That is, the surgeons, medical oncologists and radiation oncologists of the various cancer treatment units (e.g. lung, colorectal and breast) each have the opportunity to send patients to other professionals (geriatricians, nurse navigators and also palliative care physicians and allied health professionals such as physio-therapists) to address specific care needs. Although the referral process is not optimal because of a lack of objective protocols, it allows a rapid mobilization – in an ad hoc way – of resources for diagnosis, treatment and follow up. This hub and spoke models relies on largely informal information channels and allows faster information flows and better responsiveness to patient needs than would be

possible through most types of hierarchies and markets. This is important when dealing with complex case requiring that different resources/expertise are mobilized quickly. This study illustrates the development of such responsive organization through the formation of two of its constituent networks.

Healthcare professionals mediate any development of inter-professional networks to improve care outcomes. Previous research suggests that imposing or mandating inter-professional networks in healthcare hardly lead to the intended forms of collaboration (Goodwin *et al.*, 2004; Currie *et al.*, 2009). Developing an inter-professional network requires that the priorities/interest of the network is in line with those of the professional groups expected to participate (especially the powerful groups) (Goodwin *et al.*, 2004; Currie *et al.*, 2009). Additional research is needed to identify initiatives that professionals undertake to help realize this alignment. Our study contributes to address this need as it documents the role of knowledge sharing and day-to-day persuasion efforts in developing inter-professional networks.

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