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General practitioner–specialist relationships in shared care systems: insights from a review of the literature

In general practice, patients stay and diseases come and go. In hospitals, diseases stay and patients come and go.

Heath (1995: 373)

This article analyses interactions between general practitioners and specialists within shared care systems. The professional interactions among doctors who treat patients jointly are crucial in the operation of efficient and effective healthcare systems. Smooth relationships result in higher quality patient care and lower total cost. This article discusses the choice of specialist by general practitioners and elaborates on three aspects of the ensuing professional interaction: collaboration in the interest of the patient, educational interaction, and communication. This article argues that the professional interactions between general practitioners and specialists have smoothed over the last few decades, despite major differences in roles and core values—several new collaborative care projects have been launched, and efforts have been made to improve the outcome of educational interactions and decrease the gap in communication. In recent years, social network analysis has been applied to assess both formal and informal relationships between general practitioners and specialists. This article discusses in detail networks constructed on the basis of shared patients, and presents the number of specialists with whom general practitioners have to interact and elaborates on cost implications. To optimise healthcare in terms of both spending and utilisation, the literature suggests that healthcare managers need to encourage general practitioners to refer patients only to those specialists with whom they can communicate efficiently.

General practitioners (GPs) are the gatekeepers to secondary healthcare. Their interactions with specialists (SPs) have important implications for any healthcare system where GPs are the first point of contact for patients—and of access to relatively scarce and expensive specialist services (Westerman et al. 1990).[2] Based

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[2] The term *general practitioner* (GP) is synonymous with family doctor, family medical practitioner, generalist medical practitioner, and primary care doctor—GPs provide continuing and comprehensive medical care to individuals, families, and communities (WHO 2010). In contrast, the term *specialist* (SP) refers to a medical practitioner who

on semi-structured interviews, Marshall (1998a) argued that many GPs have a respectful and supportive attitude toward SPs, important in shared care schemes—GP respect for SPs generates trust in SP advice among patients and improves the outcome of patient–doctor interaction.

Interactions among patients, GPs, and SPs are central to the efficient and effective operation of shared care systems. Good, smooth relationships entail efficient collaboration and communication, and result in improved outcome from both patient and doctor perspectives. This was shown by Hoskins et al. (1993), McGhee et al. (1994), and Booth et al. (1996), for example, and by Ezekowitz et al. (2005), who found that heart-failure patients received significantly better care when undergoing treatment involving GPs working collaboratively with SPs.

At the same time, good, smooth relationships promote appropriate, effective use of resources and result in lower cost of care. Wagner (2000) reported that smooth collaboration between GPs and SPs improves patient care efficiency and contributes to decreasing costs, particularly in cases of chronic illness. Both Barnett et al. (2012a) and Pollack et al. (2013) found evidence that patients treated by sets of doctors who share high numbers of patients—that is, GPs and SPs who are strongly linked and most probably communicate efficiently among them—tend to have lower cost of care and healthcare utilisation. Thus, a collaborative relationship is not only in the patient's best interest, but also in the interest of the whole society. In addition, if GPs match patient characteristics with the personality of the SP, than the communication between patient and SP is also smooth and most probably improves the outcome of the interaction. However, this would involve GPs interacting professionally with many SPs, leading to lower system efficiency and higher cost of care and likelihood of hospitalisation.

This article is based on an analysis of the relevant literature and aims to support the ongoing empirical research into patient-sharing networks by addressing ten research questions. (1) How many SPs provide care for a GP's patients? (2) Is the patient-sharing network dense or rather fragmented? (3) What determines a GP's patient split among SPs? (4) Does an SP provide care for the majority of a GP's patients? (5) What determines the number of SPs who provide care for a GP's patients? (6) What are the socio-demographic and network topological characteristics of popular SPs? (7) Do doctors with similar doctor and patient-panel characteristics share more patients? (8) Does homophily[3] hold for the GP–SP relationship? (9) Is the number of SPs who provide care for a GP's patients similar across specialities? Equally, is a GP's patient split among SPs similar

focuses on certain disease categories, types of patients, or methods of treatment (WHO 2010). The term *doctor* describes any medical practitioner who holds a professional medical degree.

[3] In social networks, people's tendency to associate with similar people.

across specialities? (10) What are the cost implications of the patient-sharing network structure?

This article is structured into six sections. Following this introduction, the second section analyses shared care systems and the particular case of Hungary. The third section discusses the choice of SPs by GPs. SP characteristics obviously affect the smoothness of GP–SP professional interactions and the outcome of the service provided. The fourth section presents the literature on GP–SP professional interaction. The aim is to understand the relationships between these two main branches of the medical profession through what GPs and SPs think of each other, how they behave towards each other, how they communicate between them, and what the main differences and problems between them are. This is important because of its notable effect on the quality and cost of healthcare. The fifth section reviews studies mapping formal and / or informal relationships between GPs and SPs through social network analysis (SNA)—these studies use survey information for traditional social networks and administrative data for patient-sharing networks. The sixth section brings together the conclusions of this extensive literature review.

Shared care

Governments place increasing emphasis on primary and secondary care integration to achieve better and smoother patient care, better collaboration among healthcare professionals, and an effective balance between community and hospital care. In countries with well-developed social security systems, the ultimate aim of primary and secondary care integration is healthcare budget reduction. Shared care of chronic diseases is viewed as one way of achieving this aim, and GPs are asked to prescribe specialist medication for patients with chronic diseases such as diabetes, emphysema, or asthma. However, shared care is not just about prescribing specialist medication. Hickman, Drummond, and Grimshaw (1994: 118) defined shared care as ‘the joint participation of hospital consultants and general practitioners in the planned delivery of care for patients with a chronic condition, informed by an enhanced information exchange over and above routine discharge and referral letters’.

GPs’ main roles in shared care systems are as first points of contact for patients and as gatekeepers for secondary healthcare services. GPs control patient access to specialist care and refer patients when necessary. When SPs initiate certain therapies, GPs have to prescribe that medication for a time, usually for one year, significantly decreasing SPs’ workload and increasing their own. To obtain prescribed medication, patients have to visit their GPs monthly, allowing GPs to filter out—and refer back to SPs—patients whose health status worsens under treatment. At the same time, SPs hold the exclusive right to start therapies with

specialist medication. Usually of high cost, specialist medication—such as insulin and oral anti-diabetic medication, for example—requires complex prescribing and therapeutic monitoring arrangements not normally undertaken in general practices.

If functioning adequately, shared care systems have many advantages.

1. For patients, these translate in greater accessibility of doctors and better continuity of care (McGhee 1994). By contacting GPs instead of SPs for specialist medication prescriptions, patients save time—not least their own, since general practices are usually accessible, both from location and appointment points of view. Patients appreciate increased contact with GPs, since GPs can provide comprehensive, preventive, and coordinated care (Starfield 1992). As a result, patients find continuity and quality of care better in integrated systems than in conventional systems (Damme et al. 1994)—satisfaction with integrated care leads to patients' wish to continue to experience it (Damme et al. 1994; Diabetes Integrated Care Evaluation Team 1994).
2. For GPs, these translate in fewer misses of follow-ups and regular and more efficient communication with SPs.
3. For SPs, these translate in increased satisfaction, most probably due to decreases in workloads (Horne et al. 2001).

GPs' involvement in shared care was due primarily to pressure on hospital expenditure and resulted in important cost shifting and cost reduction (Jones et al. 1982; McGhee et al. 1994; Horne et al. 2001). For example, shared care for thyroid disease is cost effective because it reduces patient–SP contact while maintaining the review standard (Jones et al. 1982). For another example, shared care for hypertension is cost effective because the total cost is 57.3 per cent of the outpatient clinic cost and 93.6 per cent of the nurse practitioner clinic (McGhee et al. 1994). At the same time, Norris et al. (2002) argued that improvements in care for patients with diabetes result in cost savings for healthcare organisations. However, evaluating shared care effectiveness may be difficult, due to tradeoffs between treatment effectiveness and cost efficiency (Simon et al. 2001; Smith et al. 2007). For example, stepped collaborative care programmes for depressed primary care patients lead to substantial increases in treatment efficiency and moderate increases in cost efficiency (Simon et al. 2001), a result consistent with five other randomised trials of the field.

However, shared care systems have drawbacks as well advantages.

1. For patients, these translate in regular visits to GPs who—in contrast to SPs—are not experts in the fields.
2. For SPs, these translate in decreased control over patients' health status.
3. For GPs, these drawbacks are at their highest. GPs are dissatisfied with specialist medication prescribing (Horne et al. 2001), feeling unable to assume clinical responsibility for areas outside their therapeutic experience and reporting high uncertainty levels. GPs also complain about insufficient involvement in SP

management of patient care, organising shared care in practice being sometimes difficult. Although they have little input in treatment decisions, GPs have to prescribe specialist medication and accept clinical responsibility (Sibbald et al. 1992; Horne et al. 2001). While they are sometimes involved in monitoring, GPs are never involved in altering medication dosage (Horne et al. 2001). Nevertheless, because they think it facilitates patient access to specialist medication, GPs are willing to prescribe it.
Effective medical leadership results in effective shared care systems capable of sorting out such inherent drawbacks (Kvamme, Olesen, and Samuelsson 2001).

In Hungary, GPs refer patients—including those in shared care—to healthcare providers designated by the National Health Insurance Fund (NHIF) as nearest to either patient or GP. However, at patient request, GPs can refer patients to any outpatient services in Hungary—provided that patients make such requests on referral. In turn, requested outpatient services can only refuse such patients if their treatment endangers the treatment of patients within their own area. Moreover, at patient request, GPs can refer patients in integrated care to any SPs in Hungary—free of charge, if the SPs belong to the NHIF-designated healthcare providers, or for an extra fee, if they do not. In practice, this extra fee is rarely charged.

Choosing SPs in shared care systems

SP characteristics evidently influence smoothness in professional relationships, as well as the outcomes of interaction. Several recent studies into choice of healthcare providers at the point of referral have suggested unambiguously that patient choice relies primarily on personal past experience and GP advice (Robertson and Dixon 2009; Victoor et al. 2012). For example, Robertson and Dixon (2009) found on a sample of 2,181 British patients that 41 per cent drew on personal past experience and 36 per cent on GP advice—in 18 per cent of cases, patients followed advice from family and friends. This section summarises the literature on patient choice relative to decision maker. Where GPs make the choice on patients' behalf, it explores the role of GPs in suggesting particular SPs—why and how does a GP advise? on what information does a GP advise? Where patients make the choice on their own behalf, it discusses briefly the factors that determine patient choice.

GPs as decision makers

GPs play an important role in patient choice (Rosen, Curry, and Florin 2005; Robertson and Dixon 2009)—the empirical evidence suggests that either patients rely on GPs for advice or GPs decide on patients' behalf (Magee, Davies, and

Coulter 2003; Kraetschmer et al. 2004; Fotaki et al. 2008, Victoor et al. 2012). Unless patients express a preference, most GPs make choices on patients' behalf (Rosen, Florin, and Hutt 2007), suggesting particular SPs. Alternatively, GPs provide information that may help patients choose from a limited number of SPs.

Patients faced with serious healthcare decisions rely on GP advice and do not value making decisions on their own (Barnett, Odgen, and Daniells 2008)—they appear less likely to exercise choice when they are in a state of uncertainty, vulnerability, or distress (Fotaki et al. 2008). Patients rely on GPs for information and advice for various reasons (Dixon et al. 2010). First, making bad choices has serious consequences for patients. Second, patients often find it difficult to ascertain health service quality. Third, health service information is often too technical for patients—GPs may help patients to interpret it.

Patients tend to involve GPs in decisions about where to receive treatment (Forrest et al. 2002; Schwarz, Woloshin, and Birkmeyer 2005). For example, of 510 patients, over 70 per cent relied on GPs for choosing where to undergo major surgery; of these, 31 per cent let GPs choose on their behalf and 41 opted for joint decision making (Schwartz, Woloshin, and Birkmeyer 2005). For another example, of 34,519 patient visits occurring during 15 consecutive business days in 141 GP offices in 87 general practices, GPs made 2,534 new referrals in 1,771 practice days, recommending specific SPs to patients in 86.2 per cent of the referrals (Forrest et al. 2002). More recently, Beckert, Christensen, and Collyer (2012) also found empirical evidence of GP influence over patient choice—the higher a GP's frequency of past-referral to a particular hospital, the higher the probability that any of that GP's patients will choose the same hospital.

Numerous studies have attempted to determine the factors influencing GPs' choice of SPs on behalf of patients.

SP medical skill is the most important factor according to empirical evidence (Javalgi et al. 1993; Kinchen et al. 2004; Barnett et al. 2012b). At the time, Kinchen et al.'s (2004) cross-sectional survey of GPs was the first national study—their stratified sample consisted of 615 GPs. Of these, 88 per cent considered the SP medical skill of major importance. Several years earlier, Javalgi et al. (1993) found that 90 per cent of 610 GPs considered the SP medical skill of importance. More recently, Barnett et al. (2012b) reported that doctors had uniformly chosen clinical expertise above all other options during the pilot study.

Patient experience of and satisfaction with SP is the second most important factor, according to the literature, and encompasses many aspects of patient care—for example, good patient–SP rapport, quality of patient management, patient results, and healthcare services tailored to the needs of the patient. Of the studied GPs, 84.2 per cent considered this factor important (Kinchen et al. 2004)—GPs cited the reason 'my patients have good experience with this physician' most

(Barnett et al. 2012b). Ludke (1982) and Javalgi et al. (1993) advanced similar arguments.

GP's personal knowledge of SP was found the most important factor in Forrest et al.'s (2002) carefully designed nationwide study—and important by Ludke (1982), Kennedy and McConnell (1993), Mahon et al. (1993), and Piterman and Koritsas (2005). In line with Barnett et al. (2012b), Kennedy and McConnell (1993) argued that GPs are likely to know the local SPs best—GPs cited the reason 'works in my hospital or practice' most.

Quality of SP communication with GP is also a strong factor (Ludke 1982; Forrest et al. 2002; Kinchen et al. 2004; Piterman and Koritsas 2005; Barnett et al. 2012b)—in Barnett et al.'s (2012b) categorisation of reasons for choice of referral, this factor was the most important.

Patient access to SP is also a factor (Javalgi et al. 1993; Mahon et al. 1993; Forrest et al. 2002; Piterman and Koritsas 2005; Barnett et al. 2012b) and encompasses aspects such as patient proximity to and accessibility of the SP's office and SP appointment availability. Although easy patient access to SP reduces the burden for patients, this factor is quite marginal by comparison with others—this may reflect GPs' ability to consider clinical needs and inability to consider other needs important to patients (Barnett et al. 2012b).

Patient request of SP is a factor in some—but by no means all—cases (Ludke 1982; Javalgi et al. 1993; Mahon et al. 1993; Forrest et al. 2002; Piterman and Koritsas 2005). GPs need to exercise caution, when patients rely—as they often do—on their own past experience or on advice from family and friends.

Other—rather marginal—factors include hospital admissions (Piterman and Koritsas 2005), health insurance and health plan requirements (Forrest et al. 2002; Kinchen et al. 2004; Piterman and Koritsas 2005), SP efforts to return patients to GPs for care (Kinchen et al. 2004), and sharing the same medical record system (Barnett et al. 2012b).

Patients as decision makers

Around 20–30 per cent of patients choose SPs without recourse to GP advice (Forrest et al. 2002; Schwartz, Woloshin, and Birkmeyer 2005). The literature on determinants of patient choice is widespread—for example, Victoor et al. (2012) analysed patient choice of healthcare providers based on 118 studies published after 1995—although the literature discusses mainly determinants for selection of GPs, determinants for selection of SPs should be similar.

Humaneness. Wensing et al.'s (1998) systematic review of 57 studies concluded that the aspect most important for patients is humaneness—generally, patients prefer friendly doctors who listen to patients and with whom patients have good relationships. This conclusion was corroborated by Mavis et al. (2005)—who

reported that interpersonal communication is the most important factor when patients select doctors, whether GPs or SPs—and by Bernard, J. C. Sadikman, and C. L. Sadikman (2006). In addition, Robertson, Dixon, and Le Grand (2008) argued that variables relating to patient–doctor relationships have stronger explanatory power than all the other aspects of the patient experience.

Competence and accuracy. Patients prefer qualified and experienced doctors, particularly when doctors' specialisations / interests match patient care needs (Victoor et al. 2012)—Wensing et al. (1998) concluded that competence and accuracy are the second most important aspect for patients. This conclusion was corroborated by Mavis et al. (2005), but contested by Bornstein, Marcus, and Cassidy (2000), who found that professionally relevant factors—such as board certification and specialisation, for example—are of greatest perceived importance.

This controversy in the literature suggests that patients value both doctors' interpersonal skills and doctors' technical capabilities. The importance patients attach to these factors depends on the type of illness, patients' socio-demographic characteristics, and patients' knowledge, attitudes, and beliefs[4] (Victoor et al. 2012). However, studies published after Wensing et al. (1998) suggested that patients value doctors' technical capabilities slightly more than they do doctors' interpersonal skills (R. Arora, Singer, and A. Arora 2004; Fung et al. 2005). R. Arora, Singer, and A. Arora (2004) found that doctors' technical capabilities influence patients' attitude to visits, as well as their intention to recommend doctors, whereas doctors' interpersonal skills and office staff-related variables do not influence patients' attitude to visits. If patients have to choose a doctor based on one single merit, then they choose 'the one with the best outcomes, even if people skills were not that great' (Donald Fisher, Chief Executive Officer of the American Medical Group Association, quoted in Rice 1996: 56). With the help of computerised report cards, Fung et al. (2005) 'forced' survey participants into tradeoffs between doctors' interpersonal skills and their technical capabilities. When faced with complex tradeoffs, nearly two-thirds chose the doctor who excelled in technical capabilities, whereas only 33 per cent chose the doctor who excelled in interpersonal skills.

Several other factors influence patients' choice of doctors, with lesser degrees of importance. *Patient involvement in decision making* is the third most important such factor according to Wensing et al. (1998). Organisational aspects such as *availability* (which translates into waiting time and flexibility) and *accessibility* (both geographical and financial) are also important to patients (Wensing et al.

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[4] Generic terminology that may refer—for example—to patients' (1) medical knowledge; (2) attitudes towards healthcare-acquired infections and doctors' gender and professional juniority; and (3) healthcare beliefs, determined mostly by culture, religion, or personality.

1998; Bornstein, Marcus, and Cassidy 2000; Bernard, J. C. Sadikman, and C. L. Sadikman 2006; Victoor et al. 2012)—R. Arora, Singer, and A. Arora (2004) argued that health is always important, while convenience is only important in low-involvement situations. *Time devoted to care* and *continuity of care* (Wensing et al. 1998; Safran et al. 2001) and doctors' *socio-demographic characteristics* (such as age and gender, for example) also influence patient choice. Finally, a large number of studies reported *recommendations from family and friends* as also important to patients (Bornstein, Marcus, and Cassidy 2000; Schwartz, Woloshin, and Birkmeyer 2005), while others reported *outcome indicators* (such as mortality or pressure sore rates, for example) (Victoor et al. 2012).

Professional interactions between GPs and SPs

In recent years, several factors have contributed to changes in the professional interactions between GPs and SPs. SPs are undoubtedly less autonomous and less powerful within hospital environments than they have been in the past, due to increased management control (Browse 1996). Also, the quality of training has improved, in general practices, as have practice premises and the services and skills available in primary healthcare. The key role of GPs as patient advocates has been enshrined in legislation in many countries (Secretary of State for Health 1989; WHO 2010), and GPs' influence as purchasers of hospital services has resulted in professional power shift (Klein 1995).

The roles of GPs and SPs differ—and so do their perspectives (Kvamme, Olesen, and Samuelsson 2001). The differences in perspectives, cultures, and working conditions in the medical profession reflect the wide range of medical, psychological, and social problems of the patients. While patients need a variety of expertise and technical competence, working within one medical reality may diminish understanding of—and even respect for—the concerns of others. However, little effort has been devoted to bridging professional groups and enabling them to understand their roles in conjunction with those of others within the same healthcare system (Olesen 1998). Some researchers even argued that the two branches of the profession have such different core values that lack of understanding is inevitable (Whitfield 1980; Whitfield and Bradley 1989; Wood 1993).

Professional interactions between GPs and SPs impact significantly the quality and efficiency of patient care and receive notable interest in the literature—this section summarises key findings with respect to collaboration, teaching and learning, and communication.

Collaboration

In shared care, collaboration—working together to accomplish a certain task—results in both effective and efficient healthcare. Efficient collaboration is important—GPs and SPs have to improve patient care efficiency by contributing to reducing costs (Wagner 2000; Ezekowitz et al. 2005; S. L. M. Rubak, Mainz, and J. Rubak 2005; Pollack et al. 2013).

However, there needs to be a clearly defined dividing line between primary and secondary care, in general, and GPs and SPs, in particular. Kvamme, Olesen, and Samuelsson (2001) argued that this distribution of tasks does not imply that SPs have to deal with all the technical problems and GPs with all the other problems. GPs work within an expanded biological, psychological, and social model—while much of their work integrates relevant aspects of patient reactions, coping strategies, empowerment strategies, and social contexts, parts of their work are simply technical.

Knowing what the two main branches of the medical profession think of each other is indispensable to building up a collaborative system. Over forty years back, Horder (1977) summarised the traditional perceptions and found that GPs were jealous of the status, facilities, and income of SPs, as well as resentful of lack of special training, while SPs were dismissive of GPs' preoccupation with 'minor' problems—mostly psychological or social—and with distinguishing minor problems from major ones so that they can refer the latter to SPs. While this description may be exaggerated, detailed studies of the profession in the 1960s and 1970s also highlighted major communication problems between GPs and SPs (Stevens 1966; Honigsbaum 1979).

However, more recent studies tell a rather different story. There is a high level of mutual respect and cooperation between GPs and SPs, as well as a strong desire to build personal professional relationships over long periods of time (Marshall 1999). In general, both GPs and SPs work hard at solving—and even altogether avoiding—potential conflicts. Marshall (1999) argued that professional relationships between GPs and SPs are even better than both literature and anecdotal stories suggest. A significant proportion of SPs understand that GPs are more than just filters for hospital services and regard GPs as colleagues who do not necessarily follow their advice—moreover, SPs are ready to learn from and within general practices (Marshall 1999). However, there are areas of significant disagreement between GPs and SPs—such as over financial parity and direct access to special investigations, for example.

Several collaborative care projects have been launched—however, most of them have failed, for the following reasons (Berendsen et al. 2006):

1. SPs do not regard GPs as equal in professional expertise.

2. SPs seem to satisfy their collaborative needs through informal networks with incidental professional contact, and develop relationships with GPs on a more personal level first.
3. Teaching GPs and regulating patient flow are SPs' main motivation for collaboration.
4. In the majority of cases, lack of time, lack of financial compensation, and lack of collegial support.
5. Restrictive guidelines and time-consuming project complexity.

Similarly to Berendsen et al. (2006), Kasje et al. (2004) found that GPs are more ready to cooperate—and more supportive of developing joint treatment guidelines than SPs, who think them superfluous. In contrast, GPs think that joint guidelines and treatments facilitate smoother relationships between SPs and GPs.

In sum, developing new models for collaboration has to take into account the interests and needs of the professionals. For SPs, improving referral quality and regulating patient flow are primary aims for collaborative care, according to Berendsen et al. (2006)—for GPs, learning from SPs is a primary aim Thus, investing time and money on improving collaboration between GPs and SPs is well founded, and collaboration may improve through teaching and learning.

Teaching and learning

The literature on teaching and learning in shared care systems is widespread and focuses on areas such as reasons for education (Young 1967; Allery, Owen, and Robling 1997; Kvamme, Olesen, and Samuelsson 2001), effectiveness of continuing medical education programmes in changing doctor behaviour (Stein 1981; Haynes et al. 1984; Beaudry 1989; McLaughlin and Donaldson 1991; Davis et al. 1992, 1995), and SPs and GPs teaching and learning from each other (Marshall 1998b; Berendsen et al. 2006). This section of the article focuses exclusively on the latter.

The importance of effective health education and educational interaction was highlighted by Folsom as early as 1963—imposing time lags between disclosure and utilisation of new public health knowledge, he argued, deprives patients of the benefits of medical research. Thus, the new knowledge should be spread as fast as possible among professionals, and education should play an important role in this process. Kvamme, Olesen, and Samuelsson (2001) too argued that bringing GPs and SPs together and developing personal and group relations through education is a powerful instrument of change.

Education narrows the knowledge gap between GPs and SPs and is important in shared care systems. GPs and SPs have different, but complementary, knowledge and skills—and potentially much to learn from each other (Westerman et al. 1990; Marshall 1998b). Marshall (1998b) reported that medical professionals are willing

to learn from one another—so far, the literature has identified three models of educational interaction: traditional didactic lectures given by SPs to GPs, interactive clinically based teaching, and informal interaction based on referrals (Marshall 1998b). However, many GPs are dissatisfied—they dislike didactic lectures (Long and Atkins 1974), want supplementary feedback from SPs on the quality and appropriateness of their referrals, and complain that the content of SP teaching is often irrelevant (Westerman et al. 1990; Newton, Eccles, and Hutchinson 1992; Newton et al. 1994).

In shared care systems, several barriers prevent effective educational interaction between GPs and SPs. Beliefs are one of the most important—most SPs believe that there is not much SPs can learn from GPs (Marshall 1998b), but that GPs can learn something from SPs (Berendsen et al. 2006). Marshall (1998b) attempted to identify the main barriers between GPs and SPs and suggest ways to overcome them. He found that there was a mismatch between what SPs delivered educationally and what GPs wanted—information directly applicable to their clinical work and two-way learning opportunities centring on referrals. However, in fairness to SPs, GPs were not articulating their learning needs clearly (Marshall 1998b). Thus, prior to educational interaction, GPs and SPs have to ascertain their respective needs and wants. SPs preferred to concentrate on new developments in their area—most responded willingly to teaching requests and seemed motivated by a deep sense of professional duty, including the improvement of referral quality. However, GPs were complaining about SPs' teaching skills and communication abilities—criticisms accepted by SPs and explained through lack of educational training. In addition, SPs and GPs seemed locked in a traditional teacher–pupil hierarchy, questioned by few GPs and even fewer SPs, although some GPs thought they could indeed teach SPs—for example, communication methods. The literature has uncovered few examples of successful joint initiatives to encourage two-way education between GPs and SPs (Drury 1976; Pop and Winkens 1989).

Other important barriers include disparity between what GPs want to learn from SPs and what GPs think they are taught by SPs, lack of mutual trust and respect, desire to protect each other from litigation, and low priority attached to education, due to large workloads (Marshall 1998b).

To overcome these barriers, Marshall (1998b) suggested three solutions:

1. Two-way educational needs require to be actively promoted—GPs need to articulate clearly what they want to learn from SPs and SPs need to develop adequate educational expertise.
2. SPs need to acquire work experience in general practices—this is in line with Kvamme, Olesen, and Samuelsson's (2001) recommendation that all postgraduate programmes should include time in both general and specialist practices.
3. Communication and information transfer needs to be enhanced through additional methods—such as television links, electronic communication, and the

Internet, for example, since both GPs and SPs think that time will always be a barrier to effective educational interaction. However, such communication networks dehumanise interaction with colleagues.

Communication

The quality of the communication between GPs and SPs affects both patient care and participant satisfaction with the caring process (Mages and Mendelsohn 1979; Maher 1982; Rosser and Maguire 1982; Nylenna 1985; Cuisinier et al. 1986; Sangster, Gerace, and Hoddinott 1987). Moreover, interactive communication between GPs and SPs improves the effectiveness of GP–SP collaboration (Foy et al. 2010). This section of the article reviews the advantages and disadvantages of various communication channels (such as referral letters and communication by telephone or email, for example); stresses the importance of trust between GPs and SPs; and lists some solutions for the communication gap between GPs and SPs.

The literature on communication between GPs and SPs is widespread, with most studies focusing on *referral letters* and replies to referral letters as important vehicles for conveying patient information and creating and sustaining professional relationships. These studies suggest that the content of this correspondence needs to be improved (Dowie 1983; Wood 1993; Newton et al. 1994).

SPs complain that referral letters contain inadequate information at times (Pullen and Yellowlees 1985). However, GPs are not experts in particular fields, and do not want to presume diagnosis (Dowie 1987). At the same time, GPs criticise SPs often, claiming that SPs do not actually read their referral letters (Doleman 1988; Bremer 1989), fail to understand the problems of the patient (Grace and Armstrong 1986, 1987; Carroll 1988), and disregard important psycho-social patient information (Grace and Armstrong 1987). GPs also criticise SPs for delays in communication (Mageean 1986; Harding 1987; Sandler and Mitchell 1987; Penny 1988) and quality of information (Harding 1987; Muzzin 1992; Wood 1993)—SPs' replies provide clinical and administrative information, thus accomplishing their basic objective, but do not usually address socio-psychological aspects (Newton et al. 1994) and non-clinical matters that affect around one-fifth of referrals. This view was confirmed by Westerman et al. (1990), who found that lack of clear information on patient medical problem, diagnosis, and management renders one-sixth of SP replies unsatisfactory.

Bado and Williams (1984) arrived at similar conclusions by analysing communication between SPs and GPs involved in shared care for patients receiving chemotherapy and affected not only by tumour, but also by emotional and psychological problems (Nerenz, Leventhal, and Love 1982). To support such patients, GPs needed detailed patient information from SPs, as well as detailed patient-related information—what patients and their families make of the treatment

is almost as important as the treatment itself (Long and Atkins 1974; de Aleron, Glanville, and Hodsen 1980). However, the SP replies lacked information in two areas considered essential by most GPs—what the future prognosis is and how much patients know about their diagnosis (Bado and Williams 1984). Other relevant information—such as drug regimens, results of investigations carried out in hospitals, explanations of symptoms, and details of follow-up plans—is also often missing from SPs' replies (Harding 1987).

GPs also complain about SPs cross-referring patients within the hospital—without back-referring them to GPs (Covell 1988)—and about SPs not keeping GPs informed and not returning patients to their care once a specific problem has been identified (Doleman 1987).

Some studies focused on *telephone* communication in everyday practice (Muzzin 1992; Hollins, Veitch, and Hays 2001)—important primarily in organising referrals (Hollins, Veitch, and Hays 2001). GPs call the SPs they know and appear to have fairly well-established networks of such SPs. Empirical evidence shows that networks play an important role in communication, and contribute to effective delivery of healthcare services, efficiency in daily job activities, and overall professional morale, development, and job satisfaction (Hollins, Veitch, and Hays 2001; Joyce, Veitch, and Crossland 2003; Hoelscher, Hoffman, and Dawley 2005; Fields et al. 2008). (The fifth section discusses healthcare network characteristics and consequences in detail.)

In an extensive literature review, Kripalani et al. (2007) advocated for adequate use of *information technology* to improve delivery and quality of discharge summaries—in support, he cited the works of Janik et al. (1978), Llewelyn et al. (1988), Smith and Holzman (1989), Lissauer et al. (1991), Branger et al. (1992), Archbold et al. (1998), and van Walraven et al. (1999). Information technology allows fast and structured retrieval of information on diagnoses, medications, and test results. Such information may also include specific instructions tailored to pending test results, as well as other follow-up needs. Electronic medical records ensure integrity of and speed in the data capture process, and could be configured to deliver information to designated GPs through facsimile or email—alternatively, GPs could be allowed direct access to information (Sujansky 1998; Bates and Gawande 2003; Weiner et al. 2003; Delpierre et al. 2004; Hersch 2004; Weiner et al. 2005; Chaudhry et al. 2006). However, there are numerous practical concerns related to the use of information technology—of security, confidentiality, cost, and complexity, for example. Therefore, in addition to computer-based solutions, other measures proved effective in improving information transfer—for example, giving a copy of the most pertinent data to patients increases the likelihood of information being available to GPs at the first follow-up visit (Dover and Low-Beer 1984; Sandler and Mitchell 1987; Kendrick and Hindmarsh 1989; Curran, Gilmore, and Beringer 1992).

Several researchers found that *trust* is an important element in communication, since it increases the reliability of information—mutual respect is crucial for successful communication (Grant 1982; Grant and Dixon 1987). Muzzin (1992) reported that communication was satisfactory when doctors could establish a relationship of mutual respect over several years—interviewees expressed some nostalgia for the days long past when the satisfaction of long-standing personal communication was routinely based on mutual respect earned through knowledge of one another's medical abilities. Schaffer and Holloman (1985) described referral processes where SPs were selected from close circles of colleagues with whom GPs felt comfortable and were respected peers—GPs and SPs shared similar backgrounds, interests, and, perhaps, education or post-doctoral training.

Table 1: GP-extrinsic and GP-intrinsic barriers to effective communication between GPs and SPs

GP-extrinsic barriers	**GP-intrinsic barriers**
- due to lack of information on SP specialties, GPs do not choose the right SPs	- GPs adopt a passive approach and do not ask for the information they really need
- several SPs may be in charge of the follow-up care of a patient	- GPs have low self-esteem and self-image and lack self-confidence
- although written referrals are common, GPs prefer personal communication	- due to insufficient knowledge of both treatment and prognosis, GPs lack confidence in follow-up care
- by delaying referrals, GPs introduce communication gaps	- GPs do not overwrite SP-suggested follow-up care due to fear of losing SP support
- GPs lack SP information on discharge and follow-up plans	- GPs practice patient-centred rather than disease-centred follow-up care and do not refer patients back to SPs, when they observe new, uncertain symptoms of the disease

Source: Based on Wood (1993).

The most important *communication shortcoming* of shared care systems was identified by Horne et al. (2001), who found that decisions to share care are often not agreed between GPs and SPs. SPs telling patients that GPs will prescribe the

medication—without informing the GPs—is one obvious illustration of this problem. The authors argued in favour of enhancing communication and information exchange between GPs and SPs in shared care systems. In shared care systems functioning adequately, SPs may follow two distinct communication strategies—'tell' or 'sell'. The former involves SPs telling GPs what to do, while the latter involves SPs asking GPs first whether they agree upon the shared care.

Although limited to communication between GPs and cancer SPs, Wood's (1993) analysis of GP-extrinsic and GP-intrinsic barriers seems to hold, over time as well as for other shared care systems (see Table 1, p. 93).

Muzzin (1992) identified a very interesting reason behind the shortcomings in communication between GPs and SPs, a reason automatically embedded in the system—the patients themselves. SPs prefer the information they receive from patients to that they receive from GPs, although it is difficult to include very technical details or rely on confused patients and patients with complex histories.

Among various *solutions for the communication gap* between GPs and SPs, Westerman et al.'s (1990)—for example—advises clear guidelines to control the content of referral and discharge letters and to manage the whole process of communication among doctors. Communication and mutual understanding may be helped by introducing other forms of contact—joint GP–SP domiciliary visits or SP sessions in health centres (Long and Atkins 1974; Harding 1987). Wood's (1993) solutions for the GP-extrinsic barriers to communication between GPs and SPs were to establish a contact person (either a nurse or a social worker) to help the GP or create a hotline for ready access to current knowledge of care and follow-up for the sickness. For patients with a complicated health status, follow-up plans and guidelines need to be developed and discussed with GPs. Also, it may be useful to create a directory of SPs and their areas of expertise. Wood's (1993) solution for the GP-intrinsic barriers was for GPs to adopt a more assertive approach with SPs and seek more personal contact with them. Face-to-face meetings in informal discussion groups and seminars may help GPs become better acquainted with SPs, share concerns, and access practical information on patient care.

Network of GPs and SPs

SNA can be used in a healthcare setting to examine structural relationships and influences and the way information travels and innovative medical ideas, tools, and practices spread. In the recent past, considerable theoretical and empirical work has been carried out on healthcare networks (Chambers et al. 2012; Cunningham et al. 2012). These studies cover professional interactions among a wide range of participants—senior nurses, medical leaders, influential players in health policy, and opinion leaders within particular specialties (West et al. 1999; Kravitz et al.

2003; Lewis 2006; Chambers et al. 2012; Cunningham et al. 2012). However, studies mapping relationships between GPs and SPs by applying SNA methods are scant—this section of the article reviews this literature. First, it reviews studies where networks of GPs and SPs were constructed on the basis of survey information. Second, it reviews studies from a new strand of literature, where networks are constructed on the basis of shared patients.

Relationships between GPs and SPs may be both formal and informal. GPs and SPs enter in informal relationships when they email, call, or curbside each other with specific clinical questions or cases—GPs may seek information or advice on patient care from SPs prior to referring patients (Keating, Zaslavsky, and Ayanian 1998). Such informal relationships have long been an important feature of medical practice. When GPs refer patients to SPs, GPs and SPs enter in formal relationships and subsequent requests for information are formalised (Barnett et al. 2011). In GP–SP networks, the edges can reflect both formal and informal relationships.

Lou et al. (2011) conducted in rheumatology one of the few survey-based studies of GP–SP networks. They found that 62 per cent of a very small sample of 84 GPs equated rheumatology care partnership with having at least one rheumatologist to whom GPs tended to refer patients. In the network of GPs and rheumatology SPs, the majority of GPs tended to have strong links with a small number of SPs and rated aspects such as adequate communication and information exchanges, low waiting times for new patients, clear and appropriate balance of responsibilities, and patient feedback and preferences as important.

In a survey-based study, Wensing et al. (2011) analysed doctors involved in the treatment of patients with Parkinson's disease. They used ParkinsonNet, a database which lists health professionals with relevant expertise, to ask volunteer participants to complete a structured questionnaire and report on their professional contacts with others in the network. The authors found that doctors were most connected within their geographical areas. Individual network aspects—such as density, two degrees of separation, degree, closeness, and betweenness centrality, for example—showed large variations. Nevertheless, the authors found empirical evidence for two associations—both a higher caseload and an affiliation with a hospital were associated with stronger connectedness to other health professionals. More precisely, health professionals who treated more than ten patients with Parkinson's disease had higher centrality and thus larger influence on the network. Also, most probably, health professionals affiliated with a hospital play a central role in the treatment of Parkinson's disease due to cross-referring patients to other professionals.

Recently, the availability of administrative data by health insurance funds has enabled researchers to construct and analyse patient-sharing networks of doctors where links between two doctors exist if they care for at least one patient

together—the weight of the link reflects the number of shared patients. Doctors may share patients for a number of reasons—referral, patient self-selection, administrative rule, or even chance (Barnett et al. 2011). Most probably, doctors who coordinate patient care have to communicate regularly and effectively with many other doctors with whom they share responsibility for at least some of their patients (Pham et al. 2009).

The presence of shared patients in fee-for-service claims data represents an important source of information on doctor relationships and enables large-scale studies using SNA tools. Barnett et al. (2011) listed several advantages of administrative data over survey data in the identification of connections within entire networks of doctors. First, networks of thousands of doctors can be identified and mapped at relatively low cost based on the identification of all pairs of doctors who share patients. Second, researchers can generate networks weighted by strength of relationship in a way that would be almost impossible with survey data. Third, administrative data is less prone to missing data—in patient-sharing networks, all doctors who file claims are in the network, not just those who respond to surveys, and all ties can be captured, not just those that can be extracted from responses to surveys.

Pham et al. (2009) carried out the first ever study on a patient-sharing network extracted from claims data—2,248 GPs who treated almost 577 thousand patients—and found that a typical GP had to coordinate with 229 other doctors working in 117 practices. The median number of peers involved was still substantial (86 doctors in 36 practices) when only patients with four or more chronic conditions (31 per cent) were considered—as well as when only a subset of important services was considered. The authors reported that the number of peers was higher for GPs (1) in solo or two-person practices, (2) in urban areas, (3) in metropolitan areas with higher supply of SPs, (4) who treated patients with more chronic conditions, or (5) with lower percentage of revenue derived from Medicaid.

Two years later, Barnett et al. (2011) published the second-known article on patient sharing. To compare connections among doctors based on shared patients with professional relationships among doctors, the authors administered a web-based survey to the members of a large academic and community doctor organisation. Doctors were presented with individualised rosters of doctors with the majority of whom they shared patients. The probability of two doctors having a recognised professional relationship increased with the number of patients shared—for example, doctors sharing nine or more patients had an 82 per cent probability. The authors argued that the results were clinically intuitive and concluded that patient sharing measured using administrative data was a valid method for predicting the existence of relationships among doctors.

Parchman, Scoglio, and Schumm (2011) used data from the Veteran Health Affairs. Data on distinct individual providers was not available, but the authors constructed a patient-sharing network of 722 nodes representing types of providers in 41 health centres who shared 266,710 patients. With relatively high average node degree, strength, and betweenness compared to other types of provider, GPs were the most central to the network. The average GP node degree—that is, the number of other nodes to which GPs are connected by sharing a patient—was 173, 42 per cent higher than the average node degree for general surgeons. The authors concluded that GPs play an important role in connecting the network and potentially diffusing information via co-caring of patients. (However, in Wensing et al.'s (2011) survey-based subnetwork, GPs were less central than SPs, their lower centrality a straightforward consequence of incomplete network.)

Landon et al.'s (2012) large-scale network was composed of almost 70 thousand doctors practising in 51 hospital referral regions—a link between two doctors signified shared treatment of Medicare beneficiaries. The authors found substantial variation in network characteristics across hospital referral regions. In line with their gatekeeper and coordinating role, GPs were more central to the network than other doctors. Doctors with ties among them were far more likely to be based at the same hospital or, at the least, in closer geographical proximity. Also, doctors tended to share patients with doctors with similar doctor and patient characteristics in terms of race and illness.

In the state-of-the-art literature, two studies explored patient-sharing subnetworks. In breast cancer care at two neighbouring healthcare institutions, Palo Alto Medical Foundation and Stanford Hospital, Bridewell and Das (2011) were interested in organisational boundaries as possible determinants of doctors evident to patients. The authors found strong intra-organisational ties among surgeons, medical oncologists, and radiation therapists and poignantly weak inter-organisational ties—patients were likely to stay in the environment where they were first treated. In prostate cancer care in three US cities, Pollack et al. (2012) examined not the network structure per se, but whether doctors' social networks are associated with variations in treatment for patients with localised prostate cancer. The authors concluded that subgroups of urologists—defined by dense connections with one another via patient sharing—show wide treatment pattern variations.

Finally, two very recent studies analysed the cost of care based on patient-sharing data. Barnett et al. (2012a) assessed the effect of patient-sharing networks of doctors on cost variation and care intensity in US hospitals. The authors considered 61,461 doctors affiliated with 528 US hospitals and reported that a typical doctor was linked to 187 other doctors for every 100 shared Medicare patients. A higher number of connections per doctor was associated with higher spending and healthcare utilisation, even after adjusting for hospital characteristics,

suggesting poorer coordination of care. In a partly similar setting, Pollack et al. (2013) tested 9,596 patients with congestive heart failure and 52,688 patients with diabetes for evidence of frequent shared care resulting in low care cost. The authors found that patients treated by sets of doctors who shared high numbers of patients tended to have significantly lower cost of care. In particular, diabetes patients in the highest tertile of care density had the highest level of overlap among providers and, on average, cost USD 1,502 less than those in the lowest tertile. The annual rate of hospitalisation was also significantly lower for patients with high care density.

Conclusions

If functioning adequately, shared care systems have many advantages (Starfield 1992; Damme et al. 1994; Diabetes Integrated Care Evaluation Team 1994; McGhee et al. 1994). However, the good functioning of shared care systems depends critically on smooth GP–SP collaboration—without it, patients may not receive appropriate treatment. Smooth collaboration results in excellent clinical care and the most positive experience possible, as well as in low healthcare cost (Jones et al. 1982; McGhee et al. 1994; Horne et al. 2001; Norris et al. 2002).

SP characteristics obviously influence the success of professional interactions between GPs and SPs. Empirical evidence suggests that, in the majority of cases, patients rely on GPs for advice—alternatively, GPs decide on their behalf (Forrest et al. 2002; Magee, Davies, and Coulter 2003; Kraetschmer et al. 2004; Schwarz, Woloshin, and Birkmeyer 2005; Fotaki et al. 2008; Victoor et al. 2012). However, in around 20–30 per cent of cases, patients choose SPs without GP involvement (Forrest et al. 2002; Schwarz, Woloshin, and Birkmeyer 2005). In both instances, GPs have to collaborate with SPs efficiently to achieve the best healthcare outcome both for patients and the system.

In most cases, patients shuffling between GPs and SPs do not receive the best possible treatment (Levin 2010). If dysfunctional, the entire referral process needs to be analysed and redesigned in five stages to ensure successful collaboration and maximum treatment efficiency. In shared care systems, as in conventional care systems, these five stages include the profound definition of relationships and roles played during treatment, the development of communication plans, the scheduling of regular communications among doctors, the communication of post-treatment results, and the assessment of post-treatment results (Levin 2010).

With regard to communication channels, some doctors prefer the immediacy of emails or the security of sites designed to handle confidential information—others may prefer the formality of letters. However, telephone calls may be more useful in conveying complex information more clearly or discussing urgent situations.

Although empirical evidence suggests that these communication channels are not without deficiencies (Dowie 1983; Bado and Williams 1984; Harding 1987; Muzzin 1992; Wood 1993; Newton et al. 1994; Hollins, Veitch, and Hays 2001; Kripalani et al. 2007), regular communication via preferred channels facilitates teamwork, enhances decision making, and builds trust among parties. Institutional contexts may both help and hinder efficient communication between GPs and SPs—however, to be efficient, doctors need to seek actively those communication channels that suit them and their patients best. To this end, they may choose any form of communication they wish—be it via telephone, facsimile, electronic surfaces, written referrals, or even the patients themselves.

SPs are strongly advised to give formal dosage instructions both to patients and GPs and secure GP agreement prior to prescribing specialist medications to patients (Horne et al. 2001). In addition, SPs need to make both patients and GPs aware of potential side effects and necessary remedial measures. To ensure patient understanding, secure patient trust and compliance, and facilitate optimal outcomes, treatment plans need to be reviewed with patients by both SPs and GPs (Grant 1982; Muzzin 1992). In cases of re-referral, GPs need to inform SPs of the challenges they have faced and use such situations as learning opportunities.

If doctors work together constructively, patient care is optimal, patient experience is universally positive, and doctors build positive reputations and attract more patients. In addition, recent SNA literature has shown that smooth collaboration between GPs and SPs leads to sharing more patients and collaborating not just more effectively, but also more efficiently (Barnett et al. 2012a; Pollack et al. 2013).

References

Allery, L. A., Owen, P. A., and Robling, M. R. (1997). 'Why General Practitioners and Consultants Change Their Clinical Practice: A Critical Incident Study', in *British Medical Journal*, 314/7084: 870–4.

Archbold, R. A., Laji, K., Suliman, A., Ranjadayalan, K., Hemingway, H., and Timmis, A. D. (1998). 'Evaluation of a Computer Generated Discharge Summary for Patients with Acute Coronary Syndromes', in *British Journal of General Practice*, 48/429: 1163–4.

Arora, R., Singer, J., and Arora, A. (2004). 'Influence of Key Variables on the Patients' Choice of a Physician', in *Quality Management in Health Care*, 13/3: 166–73.

Bado, W. and Williams, C. J. (1984). 'Usefulness of Letters from Hospital to General Practitioners', in *British Medical Journal*, 288/6433: 1813–14.

Barnett, J., Odgen, J., and Daniells, E. (2008). 'The Value of Choice: A Qualitative Study', in *British Journal of General Practice*, 58/554: 609–13.

Barnett, M. L., Landon, B. E., O'Malley, A. J., Keating, N. L., and Christakis, N. A. (2011). 'Mapping Physician Networks with Self-reported and Administrative Data, in *Health Services Research*, 46/5: 1592–609.

Barnett, M. L., Christakis, N. A., O'Malley, J., Onnela, J. P., Keating, N. L., and Landon, B. E. (2012a). 'Physician Patient-sharing Networks and the Cost and Intensity of Care in US Hospitals', in *Medical Care*, 50/2: 152–60.

Barnett, M. L., Keating, N. L., Christakis, N. A., O'Malley, A. J., and Landon, B. E. (2012b). 'Reasons for Choice of Referral Physician among Primary Care and Specialist Physicians', in *Journal of General Internal Medicine*, 27/5: 506–12.

Bates, D. W. and Gawande, A. A. (2003). 'Improving Safety with Information Technology', in *New England Journal of Medicine*, 348/26: 2526–34.

Beaudry, J. S. (1989). 'The Effectiveness of Continuing Medical Education: A Quantitative Synthesis', in *Journal of Continuing Education in the Health Professions*, 9/4: 285–307.

Beckert, W., Christensen, M., and Collyer, K. (2012). 'Choice of NHS-funded Hospital Services in England', in *The Economic Journal*, 122/560: 400–17.

Berendsen, A. J., Benneker, W., Schulikng, J., Rijkers-Koorn, N., Slaets, J. P. J., and Meyboom-de Jong, B. (2006). 'Collaboration with General Practitioners: Preferences of Medical Specialists—A Qualitative Study', in *BMC Health Services Research*, 6/1: Article 155.

Bernard, M. E., Sadikman, J. C., and Sadikman, C. L. (2006). 'Factors Influencing Patients' Choice of Primary Medical Doctors', in *Minnesota Medicine*, 89/1: 46–50.

Booth, C. M., Chaudry, A. A., Smith, K., and Griffiths, K. (1996). 'The Benefits of a Shared-care Prostate Clinic' in *British Journal of Urology*, 77/6: 830–5.

Bornstein, B. H., Marcus, D., and Cassidy, W. (2000). 'Choosing a Doctor: An Exploratory Study of Factors Influencing Patients' Choice of a Primary Care Doctor', in *Journal of Evaluation of Clinical Practice*, 6/3: 255–62.

Branger, P. J., van der Wouden J. C., Schudel, B. R., Verboog, E., Duisterhout, J. S., van der Lei, J., and van Bemmel, J. H. (1992). 'Electronic Communication between Providers of Primary and Secondary Care', in *British Medical Journal*, 305/6861: 1068–70.

Bremer, G. J. (1989). 'Een onderzoek van verwijsbrieven' ('A Survey of Referral Letters'), in *Huisarts en Wetenschap* (*General Practitioner and Science*), 32: 100–1.

Bridewell, W. and Das, A. K. (2011). 'Social Network Analysis of Physician Interactions: The Effect of Institutional Boundaries on Breast Cancer Care', in *Proceedings of the 2011 American Medical Informatics Association (AMIA)*

Annual Symposium, 152–60. Washington, DC: American Medical Informatics Association (AMIA).

Browse, N. (1996). 'Clinicians Must Lead', in *British Medical Journal*, 313/7067: 1268.

Carroll, J. (1988). 'Working with the Hospital Doctor', in *Practitioner*, 232/14545 (Part 2): 1034–6.

Chambers, D., Wilson, P., Thompson, C., and Harden, M. (2012). 'Social Network Analysis in Healthcare Settings: A Systematic Scoping Review', in *PLOS ONE*, 7/8: Article e41911.

Chaudhry, B., Wang, J., Wu, S., Maglione, M., Mojica, W., Roth, E., Morton, S. C., and Shekelle, P. G. (2006). 'Systematic Review: Impact of Health Information Technology on Quality, Efficiency, and Costs of Medical Care', in *Annals of Internal Medicine*, 144/10: 742–52.

Covell, D. G. (1988). 'The Good Old Days', in *New England Journal of Medicine*, 319/17: 1158–9.

Cuisinier, M. C. J., van Eijk, J. T., Jonkers, R., and Dokkertt, J. (1986). 'Psychosocial Care and Education of the Cancer Patient: Strengthening the Physician's Role', in *Patient Education and Counseling*, 8/1: 5–16.

Cunningham, F. C., Ranmuthugala, G., Plumb, J., Georgiou, A., Westbrook, J. I., and Braithwaite, J. (2012). 'Health Professional Networks as a Vector for Improving Healthcare Quality and Safety: A Systematic Review', in *British Medical Journal Quality and Safety*, 213/3: 239–49.

Curran, P., Gilmore, D. H., and Beringer, T. R. (1992). 'Communication of Discharge Information for Elderly Patients in Hospital', in *Ulster Medical Journal*, 61/1: 56–8.

Damme, R., Drummond, N., Beattie, J., and Douglas, G. (1994). 'Integrated Care for Patients with Asthma: Views of General Practitioners', in *British Journal of General Practice*, 44/378: 9–13.

Davis, D. A., Thomson, M. A., Oxman, A. D., and Haynes, R. B. (1992). 'Evidence for the Effectiveness of CME: A Review of 50 Randomised Controlled Trials', in *Journal of the American Medical Association* (JAMA), 268/9: 1111–17.

Davis, D. A., Thomson, M. A., Oxman, A. D., and Haynes, R. B. (1995). 'Changing Physician Performance: A Systematic Review of the Effect of Continuing Medical Education Strategies', in *Journal of the American Medical Association* (JAMA), 274/9: 700–5.

de Aleron, R., Glanville, H., and Hodsen, J. M. (1980). 'The Value of the Specialist Report', in *British Medical Journal*, 2/5213: 1663–4.

Delpierre, C., Cuzin, L., Fillaux, J., Alvarez, M., Massip, P., and Lang, T. (2004). 'A Systematic Review of Computer-based Patient Record Systems and Quality of Care: More Randomized Clinical Trials or a Broader Approach?', in *International Journal for Quality in Health Care*, 16/5: 407–16.

Diabetes Integrated Care Evaluation Team (1994). 'Integrated Care for Diabetes: Clinical, Psychosocial, and Economic Evaluation', in *British Medical Journal*, 308/6938: 1208–12.

Dixon, A., Robertson, R., Appleby, J., Burge, P., Delvin, N., and Magee, H. (2010). *Patient Choice*. London: King's Fund.

Doleman F. (1987): 'Improving Communication between General Practitioners and Specialists', in *Family Practice*, 4/3: 176–82.

Dover, S. B. and Low-Beer, T. S. (1984). 'The Initial Hospital Discharge Note: Send Out with the Patient or Post?', in *Health Trends*, 16/2: 48.

Dowie, R. (1983). *General Practitioners and Consultants: A study of Outpatient Referrals*. London: King Edward's Hospital Fund for London.

Drury, M. (1976). 'General Practice Teaching—within Hospital', in *Medical Education*, 10/4: 309–12.

Ezekowitz, J. A., van Walraven, C., McAlister, F. A., Armstrong, P. W., and Kaul, P. (2005). 'Impact of Specialist Follow-up in Outpatients with Congestive Heart Failure', in *Canadian Medical Association Journal*, 172/2: 189–94.

Fields, K., Van De Keere, L., Hanlon, N., and Halseth, G. (2008). *The Experiences of Occupational Therapists Practicing in Rural and Remote Communities in Northern British Columbia*. Prince George, BC: Community Development Institute, University of Northern British Columbia.

Folsom M. B. (1963). 'Today's Health Needs and Tomorrow's Services', in *American Journal of Public Health*, 53/6: 863–71.

Forrest, C. B., Nutting, P. A., Starfield, B., and von Schrader, S. (2002). 'Family Physicians' Referral Decisions: Results from the ASPN Referral Study', in *The Journal of Family Practice*, 51/3: 215–22.

Fotaki, M., Roland, M., Boyd, A., McDonald, R., Scheaff, R., and Smith, L. (2008). 'What Benefits Will Choice Bring to Patients? Literature Review and Assessment of Implications', in *Journal of Health Services Research & Policy*, 13/3: 178–84.

Foy, R., Hempel, S., Rubenstein, L., Suttorp, M., Seelig, M., Shanman, R., and Shekelle, P. G. (2010). 'Meta-analysis: Effect of Interactive Communication between Collaborating Primary Care Physicians and Specialists', in *Annals of Internal Medicine*, 152/4: 247–58.

Fung, C. H., Elliott, M. N., Hays, R. D., Kahn, K. L., Kanouse, D. E., McGlynn, E. A., Spranca, M. D., and Shekelle, P. G. (2005). 'Patients' Preferences for Technical versus Interpersonal Quality when Selecting a Primary Care Physician', in *Health Services Research*, 40/4: 957–77.

Grace, J. F. and Armstrong, D. (1986). 'Reasons for Referral to Hospital: Extent of Agreement between the Perceptions of Patients, General Practitioners and Consultants', in *Family Practice*, 3/3: 143–7.

Grace, J. F. and Armstrong, D. (1987). 'Referral to Hospital: Perceptions of Patients, General Practitioners and Consultants about Necessity and Suitability of Referral', in *Family Practice*, 4/3: 170–5.

Grant, I. N. (1982). 'Consultation Practice: Competition or Collaboration?', in *Canadian Family Physician*, 28/7: 1279–82.

Grant, I. N. and Dixon, A. S. (1987). '"Thank You for Seeing this Patient": Studying the Quality of Communication between Physicians', in *Canadian Family Physician*, 33/3: 605–11.

Harding, J. (1987). 'Study of Discharge Communication from Hospital Doctors to an Inner London General Practice', in *Journal of the Royal College of General Practice*, 37/304: 494–5.

Haynes, R. B., Davis, D. A., McKibbon, A., and Tugwell P. (1984). 'A Critical Appraisal of the Efficacy of Continuing Medical Education', in *Journal of the American Medical Association* (JAMA), 251/1: 61–4.

Heath, I. (1995). 'Commentary: The Perils of Checklist Medicine', in *British Medical Journal*, 311/7001: 373.

Hersh, W. (2004). 'Health Care Information Technology: Progress and Barriers', in *Journal of the American Medical Association* (JAMA), 292/18: 2273–4.

Hickman, M., Drummond, N., and Grimshaw, J. (1994). 'The Operation of Shared Care for Chronic Disease', in *Heath Bull*, 52/2: 118–26.

Hoelscher, M. L., Hoffman, J. J., and Dawley, D. (2005). 'Toward a Social Capital Theory of Competitive Advantage in Medical Groups', in *Health Care Management Review*, 30/2: 103–9.

Hollins, J., Veitch, C., and Hays, R. (2001). 'Interpractitioner Communication: Telephone Consultations between Rural General Practitioners and Specialists', in *Australian Journal of Rural Health*, 8/4: 227–31.

Honigsbaum, F. (1979). *The Division in British Medicine: A History of the Separation of General Practice from Hospital Care 1911–1968*. London: Kogan Page.

Horder, J. P. (1977). 'Physicians and Family Doctors: A New Relationship', in *Journal of the Royal College of General Practice*, 27/180: 391–7.

Horne, R., Mailey, E., Frost, S., and Lea, R. (2001). 'Shared Care: A Qualitative Study of GPs' and Hospital Doctors' Views on Prescribing Specialist Medicines', in *British Journal of General Practice*, 51/464: 187–93.

Hoskins, P. L., Fowler, P. M., Constantino, M., Forrest, J., Yue, D. K. and Turtle, J. R. (1993). 'Sharing the Care of Diabetic Patients between Hospital and General Practitioners: Does It Work?', in *Diabetic Medicine*, 10/1: 81–6.

Janik, D. S., Swarner, O. W., Henriksen, K. M., and Wyman, M. L. (1978). 'A Computerized Single Entry System for Recording and Reporting Data on High-risk Newborn Infants', in *Journal of Pediatrics*, 93/3: 519–23.

Javalgi, R., Joseph, W. B., Gombeski Jr., W. R., and Lester, J. A. (1993). 'How Physicians Make Referrals', in *Journal of Health Care Marketing*, 13/2: 6–17.

Jones, S. J., Hedley, A. J., Curtis, B., Allison, S. P., Woolfson, A. M. J., Steel, R., Bewsher, P. D., and Weir, R. D. (1982). 'Do We Need Thyroid Follow-up Registers? A Cost-effectiveness Study', in *Lancet*, 319/8283: 1229–33.

Joyce, C., Veitch, C., and Crossland, L., (2003). 'Professional and Social Support Networks of Rural GPs', in *Australian Journal of Rural Health*, 11/1: 7–14.

Kasje, W. N., Denig, P., de Graeff, P. A., and Haaijer-Ruskamp, F. M. (2004). 'Physicians' Views on Joint Treatment Guidelines for Primary and Secondary Care', in *International Journal for Quality in Health Care*, 16/3: 229–36.

Keating, N. L, Zaslavsky, A. M., and Ayanian, J. Z. (1998). 'Physicians' Experiences and Beliefs Regarding Informal Consultation', in *Journal of the American Medical Association* (JAMA), 280/10: 900–4.

Kendrick, A. R. and Hindmarsh, D. J. (1989). 'Which Type of Hospital Discharge Report Reaches General Practitioners Most Quickly?', in *British Medical Journal*, 298/6670: 362–3.

Kennedy, F. and McConnell, B. (1993). 'General Practitioner Referral Patterns', in *Journal of Public Health Medicine*, 15/1: 83–7.

Kinchen, K., Cooper, L., Levine, D., Wang, N., and Powe, N. (2004). 'Referral of Patients to Specialists: Factors Affecting Choice of Specialist by Primary Care Physicians', in *Annals of Family Medicine*, 2/3: 245–52.

Klein, R. (1995). *The New Politics of the NHS*. London and New York: Longman.

Kraetschmer, N., Sharpe, N., Urowitz, S., and Deber, R. B. (2004). 'How Does Trust Affect Patient Preferences for Participation in Shared Decision-making?', in *Health Expectations*, 7/4: 271–3.

Kravitz, R. L., Krackhardt, D., Melnikow, J., Franz, C. E., Gilbert, W. M., Zach, A., Paterniti, D. A., and Romano, P. S. (2003). 'Networked for Change? Identifying Obstetric Opinion Leaders and Assessing Their Opinions on Caesarean Delivery', in *Social Science & Medicine*, 57/12: 2423–34.

Kripalani, S., LeFevre, F., Phillips, C. O., Williams, M. V., Basaviah, P., and Baker, D. W. (2007). 'Deficits in Communication and Information Transfer between Hospital-based Primary Care Physicians', in *Journal of the American Medical Association* (JAMA), 297/8: 831–41.

Kvamme, O. J., Olesen, F., and Samuelsson, M. (2001). 'Improving the Interface between Primary and Secondary Care: A Statement from the European Working Party on Quality in Family Practice (EQuiP)', in *Quality in Health Care*, 10/1: 33–9.

Landon, B. E., Keating, N. L., Barnett, M. L., Onnela, J. P., Paul, S., O'Malley, A. J., Keegan, T., and Christakis, N. A. (2012). 'Variation in Patient-sharing

Networks of Physicians across the United States', in *Journal of the American Medical Association* (JAMA), 308/3: 265–73.

Levin, R. P. (2010). 'Secrets to Effective GP/Specialist Relationships: Following These Five Steps Can Foster a Spirit of Cooperation and Boost Collaboration', in *Inside Dentistry*, 6/6: 32–4.

Lewis, J. M. (2006): 'Being Around and Knowing the Players: Networks of Influence in Health Policy', in *Social Science & Medicine*, 62/9: 2125–36.

Lissauer, T., Paterson, C., Simons, A., and Beard, R. (1991). 'Evaluation of Computer Generated Neonatal Discharge Summaries', in *Archives of Disease in Childhood*, 66/4: 433–6.

Llewelyn, D. E., Ewins, D. L., Horn, J., Evans, T. G., and McGregor, A. M. (1988). 'Computerised Updating of Clinical Summaries: New Opportunities for Clinical Practice and Research?', in *British Medical Journal*, 297/6662: 1504–6.

Long, A. and Atkins, J. B. (1974). 'Communication between GPs and Consultants', in *British Medical Journal*, 4/5942: 456–9.

Lou, B., De Civita, M., Feldman, D. E., Bissonauth, A., and Bernatsky, S. (2011). 'Care Partnerships between Family Physicians and Rheumatologists', in *The Journal of Rheumatology*, 38/9: 1981–5.

Ludke, R. L. (1982). 'An Examination of Factors that Influence Patient Referral Decisions', in *Medical Care*, 20/8: 782–96.

Magee, H., Davies, L. J., and Coulter, A. (2003). 'Public Views on Healthcare Performance Indicators and Patient Choice', in *Journal of the Royal Society of Medicine*, 96/7: 338–42.

Mageean, R. J. (1986). 'Study of Discharge Communications from Hospital', in *British Medical Journal*, 293/6557: 1283–4.

Mages, N. L. and Mendelsohn, G. A. (1979). 'Effects of Cancer on Patients' Lives: A Personological Approach', in Stone, G. C., Cohen, F., and Adler, N. E. (eds), *Health Psychology: A Handbook*, 255–84. San Francisco, CA: Jossey-Bass Publishers.

Maher, E. L. (1982). 'Anomic Aspects of Recovery from Cancer', in *Social Science & Medicine*, 16/8: 907–12.

Mahon, A., Whitehouse, C., Wilkin, D., and Nocon, A. (1993). 'Factors that Influence General Practitioners' Choice of Hospital when Referring Patients for Elective Surgery', in *British Journal of General Practice*, 43/372: 272–6.

Marshall, N. M. (1998a). 'How Well Do GPs and Hospital Consultants Work Together? A Qualitative Study of Cooperation and Conflict within the Medical Profession', in *British Journal of General Practice*, 48/432: 1379–82.

Marshall, N. M. (1998b). 'Qualitative Study of Educational Interaction between General Practitioners and Specialists', in *British Medical Journal*, 316/7129: 442–5.

Marshall, N. M. (1999). 'How Well Do GPs and Hospital Consultants Work Together? A Survey of the Professional Relationship', in *Family Practice*, 16/1: 33–8.

Mavis, B., Vasilenko, P., Schnuth, R., Marshall, J., and Jeffs, M. C. (2005). 'Female Patients' Preferences Related to Interpersonal Communications, Clinical Competence, and Gender When Selecting a Physician', in *Academic Medicine*, 80/12: 1159–65.

McGhee, S. M., McInnes, G. T., Hedley, A. J., Murray, T. S., and Reid, J. L. (1994): 'Coordinating and Standardizing Long-term Care: Evaluation of the West of Scotland Shared-care Scheme for Hypertension', in *British Journal of General Practice*, 41/387: 441–5.

McLaughlin, P. J. and Donaldson, J. F. (1991). 'Evaluation of Continuing Medical Education Programmes: A Selected Literature 1984–1988', in *Journal of Continuing Education in the Health Professions*, 11/1: 65–84.

Muzzin, L. J. (1992). 'Understanding the Process of Medical Referral', in *Canadian Family Physician*, 38/2: 301–7.

Nerenz, D. R., Leventhal, H., and Love, R. R. (1982). 'Factors Contributing to Emotional Distress during Cancer Chemotherapy', in *Cancer*, 50/5: 1020–7.

Newton, J., Eccles, M., and Hutchinson, A. (1992). 'A Communication between General Practitioners and Consultants: What Should Their Letters Contain?', in *British Medical Journal*, 304/6830: 821–4.

Newton, J., Hutchinson, A., Hayes, V., McColl, E., Mackee, I., and Holland, C. (1994). 'Do Clinicians Tell Each Other Enough? An Analysis of Referral Communication in Two Specialities', in *Family Practice*, 11/1: 15–20.

Norris, S. L., Nichols, P. J., Caspersen, C. J., Glasgow, R. E., Engelgau, M. M., Jack, L., Isham, G., Snyder, S. R., Carande-Kulis, V. G., Garfield, S., Briss, P., and McCulloch, D. (2002). 'The Effectiveness of Disease and Case Management for People with Diabetes: A Systematic Review', in *American Journal of Preventive Medicine*, 22/4 (Supplement 1): 15–38.

Nylenna, M. (1985). 'The General Practitioner and Information to Cancer Patients', in *Scandinavian Journal of Primary Health Care*, 3/1: 35–8.

Olesen, F. (1998). 'General Practitioners as Advisors and Coordinators in Hospitals', in *Quality in Health Care*, 7/1: 42–7.

Parchman, M. L., Scoglio, C. M., and Schumm, P. (2011): 'Understanding the Implementation of Evidence-based Care: A Structural Network Approach', in *Implementation Science*, 6/14: 1–10.

Penny, T. M. (1988). 'Delayed Communication between Hospitals and General Practitioners', in *British Medical Journal*, 297/6640: 28–9.

Pham, H. H., O'Malley, A. S., Bach, P. B., Saiontz-Martinez, C., and Schrag, D. (2009). 'Primary Care Physicians' Links to Other Physicians through Medicare

Patients: The Scope of Care Coordination', in *Annals of Internal Medicine*, 150/4: 236–42.

Piterman, L. and Koritsas, S. (2005). 'Part II: General Practitioner–Specialist Referral Process', in *Internal Medicine Journal*, 35/7: 430–4.

Pollack, C. E., Weissman, G., Bekelman, J., Liao, K., and Armstrong, K. (2012). 'Physician Social Networks and Variation in Prostate Cancer Treatment in Three Cities, in *Health Services Research*, 47/1.2: 380–403.

Pollack, C. E., Weissman, G. E., Lemke, K. W., Hussey, P. S., and Weiner J. P. (2013). 'Patient Sharing among Physicians and Costs of Care: A Network Analytic Approach to Care Coordination Using Claims Data', in *Journal of General Internal Medicine*, 28/3: 456–65.

Pop, P. and Winkens, R. A. G. (1989). 'A Diagnostic Centre for General Practitioners: Results of Individual Feedback on Diagnostic Actions', in *Journal of the Royal College of General Practice*, 39/329: 507–8.

Pullen, I. M. and Yellowlees, A. J. (1985). 'Is Communication Improving between General Practitioners and Psychiatrics?', in *British Medical Journal*, 290/6461: 31–3.

Rice, B. (1996). 'Are Patient-satisfaction Surveys Fair to Doctors?', in *Medical Economics*, 73/23: 55–6, 59–60.

Robertson, R. and Dixon, A. (2009). *Choice at the Point of Referral: Early Results of a Patient Survey*. London: King's Fund.

Robertson, R., Dixon, A., and Le Grand, J. (2008). 'Patient Choice in General Practice: The Implications of Patient Satisfaction Surveys', in *Journal of Health Services Research Policy*, 13/2: 67–72.

Rosen, R., Curry, N., and Florin, D. (2005). *Public Views on Choices in Health and Health Care: A Qualitative Study*. London: King's Fund.

Rosen, R., Florin, D., and Hutt, R. (2007). *An Anatomy of GP Referral Decisions: A Qualitative Study of GPs' Views on Their Role in Supporting Patient Choice*. London: The King's Fund.

Rosser, J. E. and Maguire, P. (1982). 'Dilemmas in General Practice: The Care of the Cancer Patient', in *Social Science & Medicine*, 16/3: 315–22.

Rubak, S. L. M., Mainz, L., and Rubak, J. (2005). 'Shared Care: An Integrated Inter-sector Patient Course Collaboration: The Modern Health System Collaborate', in Tersa, M., *Trends in Asthma Research*, 165–75. Hauppauge, NY: Nova Science Publisher.

Safran, D. G., Montgomery, J. E., Chang, H., Murphy, J., and Rogers, W. H. (2001). 'Switching Doctors: Predictors of Voluntary Disenrollment from a Primary Physician's Practice', in *Journal of Family Practice*, 50/2: 130–6.

Sandler, D. A. and Mitchell, J. R. A. (1987). 'Interim Discharge Summaries: How Are They Best Delivered to GPs?', in *British Medical Journal*, 295/6612: 1523–4.

Sangster, J. F., Gerace, T. M., and Hoddinott, S. N. (1987). 'Family Physicians' Perspective of Patient Care at the London Regional Cancer Clinic', in *Canadian Family Physician*, 33/1: 71–4.

Schaffer, W. A. and Holloman, F. C. (1985). 'Consultation and Referral between Physicians in New Medical Practice Environments', in *Annals of Internal Medicine*, 103/4: 600–5.

Schwartz, L. M., Woloshin, S., and Birkmeyer, J. D. (2005). 'How Do Elderly Patients Decide to Go for Major Surgery? Telephone Interview Survey', in *British Medical Journal*, 331/7520/821: 1–7.

Secretary of State for Health (1989). *Working for patients. Command 555*. London: HMSO (Her Majesty's Stationery Office).

Sibbald, B., Wilkie, P., Raferty, J., Anderson, S., and Freeling, P. (1992). 'Prescribing at the Hospital–General Practice Interface II: Impact of Hospital Outpatient Dispensing Policies in England on General Practitioners and Hospital Consultants', in *British Medical Journal*, 304/6818: 31–4.

Simon, G. E., Katon, W. J., Von Korff, M., Unützer, J., Lin, E. H., Walker, E. A., Bush, T., Rutter, C., and Ludman, E. (2001). 'Cost-effectiveness of a Collaborative Care Program for Primary Care Patients with Persistent Depression', in *American Journal of Psychiatry*, 158/10: 1638–44.

Smith, R. P. and Holzman, G. B. (1989). 'The Application of a Computer Data Base System to the Generation of Hospital Discharge Summaries', in *Obstetrics & Gynecology*, 73/5: 803–7.

Smith, S. M., Allwright, S., and O'Dowd, T. (2007). 'Effectiveness of Shared Care across the Interface between Primary and Specialty Care in Chronic Disease Management', in *Cochrane Database of Systematic Reviews*, 3: CD004910.

Starfield, B. (1992). *Primary Care: Concept, Evaluation, and Policy*. New York: Oxford University Press.

Stein, L. S. (1981). 'The Effectiveness of Continuing Medical Education: Eight Research Reports', in *Journal of Medical Education*, 56/2: 103–10.

Stevens, R. (1966). *Medical Practice in Modern England*. New Haven and London: Yale University Press.

Sujansky, W. V. (1998). 'The Benefits and Challenges of an Electronic Medical Record: Much More than a "Word Processed" Patient Chart', in *Western Journal of Medicine*, 169/3: 176–83.

van Walraven, C., Laupacis, A., Seth, R., and Wells, G. (1999). 'Dictated versus Database-generated Discharge Summaries: A Randomized Clinical Trial', in *Canadian Medical Association Journal*, 160/3: 319–26.

Victoor**,** A., Delnoij, D. M. J., Friele, R. D., and Rademakers, J. J. D. J. M. (2012). **'**Determinants of Patient Choice of Healthcare Providers: A Scoping Review', in *BMC Health Services Research*, 12/272: 1–16.

Wagner, E. H. (2000). 'The Role of Patient Care Teams in Chronic Disease Management', in *British Medical Journal*, 320/7234: 569–72.

Weiner, M., Callahan, C. M., Tierney, W. M., Overhage, J. M., Mamlin, B., Dexter, P. R., and McDonald, C. J. (2003). 'Using Information Technology to Improve the Health Care of Older Adults', in *Annals of Internal Medicine*, 139/5 (Part 2): 430–6.

Weiner, S. J., Barnet, B., Cheng, T. L., and Daaleman, T. P. (2005). 'Processes for Effective Communication in Primary Care', in *Annals of Internal Medicine*, 142/8: 709–14.

Wensing, M., Jung, H. P., Mianz, J., Olesen, F., and Grol, R. (1998). 'A Systematic Review of the Literature on Patient Priorities for General Practice Care: Part 1: Description of the Research Domain', in *Social Science & Medicine*, 47/10: 1573–88.

Wensing, M., van der Eijk, M., Koetsenruijter, J., Bloem, B. R., Munneke, M., and Faber, M. (2011). 'Connectedness of Healthcare Professionals Involved in the Treatment of Patients with Parkinson's Disease: A Social Network Study', in *Implementation Science*, 6/67: 1–8.

West, E., Barron, D. N., Dowsett, J., and Newton, J. H. (1999). 'Hierarchies and Cliques in the Social Networks of Health Care Professionals: Implications for the Design of Dissemination Strategies', in *Social Science & Medicine*, 48/5: 633–46.

Westerman, R. F., Hull, F. M., Beztemer, P. D., and Gort, G. (1990). 'A Study of Communication between General Practitioners and Specialists', in *British Journal of General Practice*, 40/340: 445–9.

Whitfield, M. J. (1980). 'What Do Consultants Think of General Practice?', in *Journal of the Royal College of General Practice*, 30/213: 228–9.

Whitfield, M. J. and Bradley, M. C. (1989). 'GPs and Consultants: Is There Agreement on Patient Management?', in *Bristol Medico-Chirurgical Journal*, 104/3: 75–8.

WHO (World Health Organization) (2010). *Classifying Health Workers: Mapping Occupation to the International Standard Classification*. Geneva: WHO (World Health Organization).

Wood, M. L. (1993). 'Communication between Cancer Specialists and Family Doctors', in *Canadian Family Physician*, 39/1: 49–57.

Young, M. A. (1967). 'Review of Research and Studies Related to Health Education Practice (1961–1966)', in *Health Education Monograph*, 25/7. New York: Society of Public Health Educators.

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