The nature of informational continuity of care in general practice

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ABSTRACT

Background
The availability of patient information to practitioners forms the basis of informational continuity of care. Changes in family practice that now encourage multiphysician clinics have meant that informational continuity of care has become crucial because it is likely that a patient will not continuously see the same doctor. Therefore a review of the nature of informational continuity is useful.

Aim
To answer the question 'How is informational continuity developed in general practice?'.

Design of study
A rigorous systematic review of relevant electronic databases.

Method
Databases were searched for articles answering the research question. Articles focused on family medicine and informational continuity of care were included. Data from reviewed articles were independently extracted and reviewed by two researchers. Conceptual and evidence-based articles were included.

Results
Initially, 193 articles were obtained from all five bibliographic databases; 57 were retained following title and abstract review. Of these, 34 articles were included in the final systematic review. Results show that informational continuity of care is developed using paper/electronic records and remembered information collectively, through a series of doctor–patient consultations over time. Obstacles to its development are practitioners not recording patient information and patients not disclosing important details.

Conclusion
These findings have implications for newer styles of primary care that may have a negative impact in the successful management of chronic illnesses in particular.

Keywords
continuity of care; information management; medical records; primary health care.

INTRODUCTION

Continuity of care is seen as an indicator of 'general practice quality' by the professional bodies of general practice in countries such as the UK, Canada, the US, and Australia.[1-4] The term continuity of care covers many different aspects of continuity, specifically informational, longitudinal, and relational/interpersonal aspects.[5,6] Informational continuity is understood to be the availability of patient information to providers throughout a healthcare system.[7,8]

With recent changes in family practice in some countries that now encourage large multiphysician group clinics and increased around-the-clock access to care, developing informational continuity of care has become crucial because in such care contexts it is likely that a patient will not continuously see the same doctor. Because of this, it is useful to review what we know about the nature of informational continuity of care within general practice, in order to inform decisions regarding service restructuring and the development of future primary care services. This paper reports the findings of a systematic review answering the question: 'How is informational continuity developed in family practice?'.

METHOD

The systematic review search strategy consisted of

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thoroughly searching the following electronic databases: MEDLINE (OVID) (1966 – week 1, May, 2006), CINAHL (OVID) (1982 – week 1, May, 2006), EMBASE (1980 – week 1, May, 2006) and PSYCHINFO (1806 – week 1, May, 2006), and Web of Science (1900 – week 1, May, 2006). Databases were searched using keywords that were agreed upon by the investigators after first being independently identified (Table 1). The databases selected for the search were also agreed upon by the investigators. Articles in English deemed relevant to the search were retrieved. Reference lists of reviewed articles were manually examined for further studies.

Titles obtained from the initial searches were independently reviewed by both investigators. Articles focusing on issues outside of general practice or other aspects of continuity of care were immediately excluded. After independently selecting titles for inclusion, the investigators met to determine which articles were to have abstract review. Following abstract review, a further meeting was held to determine inclusion for full article review. Articles selected for full review were read by both investigators and data extracted independently using the same extraction form.

Because of the nature of this review and the types of articles that were identified, the focus was on systematically reviewing the content of articles selected for full review rather than the study or protocol design. Numerous meetings were held during the full review stage to confirm both extracted information and also inclusion in or exclusion from the review. During this stage, the merits and qualities of articles over which there was disagreement were

How this fits in

Informational continuity of care is developed using paper/electronic records and remembered information collectively, through a series of doctor–patient consultations over time. Obstacles to its development are practitioners not recording patient information and patients not disclosing important details. These findings have implications for newer styles of primary care which may negatively impact the successful management of chronic illnesses in particular.

discussed until both reviewers were in agreement. Following this, all extracted information recorded on the data-extraction forms were recorded on an electronic spreadsheet.
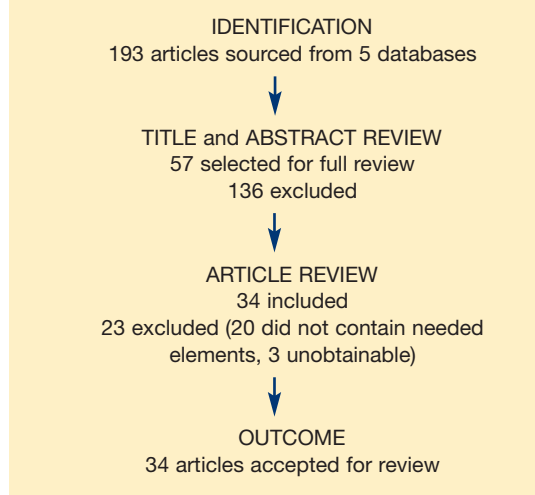
RESULTS

Initially, 193 articles were obtained from all five bibliographic databases; 57 were retained following title and abstract review (Box 1). Of these, 34 articles were included in the final systematic review. Twenty articles read in full were excluded because they did not contain the elements required for inclusion once the full paper was examined, and three articles were unobtainable. The κ score for agreement by reviewers at the title/abstract stage was 0.673 (standard error [SE] 0.17, $P = 0.004$).

Of the 34 included articles, three reported on mixed-method studies,[9–11] eight on qualitative studies,[12–19] 10 on quantitative studies,[20–29] and the remaining 13 were commentary or review articles.[30–42] Since there was little published literature on informational continuity of care, the researchers were compelled to include conceptual pieces (for

Table 1. Search strategy employed.

Subject terms	MeSH terms
Family practice	Family Practice/ or family medicine.mp. or general practice.mp. or primary care.mp. or Primary Health Care/ or general practitioner.mp. or Physicians, Family/ or Primary Health Care/ or Family Practice/or family practitioner.mp. or primary care physician.mp. or family physician.mp. or family doctor.mp. or Primary Health Care/ or primary care clinician.mp. or Community Health Centers/ or health care clinic.mp. or primary health care clinic.mp. or primary health care$.mp. or family clinic.mp
Informational continuity of care	Continuity of Patient Care/ or informational continuity of care.mp. or Physician–Patient Relations/or medical records.mp. or Medical Records/ or Medical Records Systems, Computerized/ or written medical records.mp. or electronic medical records.mp. or Mental Recall/ or Memory/ or remembered information.mp. or knowledge.mp. or Knowledge/ or Knowledge Bases/ or notes.mp. or casenotes.mp. or Medical History Taking/ or medical history.mp. or patient history.mp. or past medical history.mp. or Physician–Patient Relations/ or Communication/ or communication of information.mp. or patient charts.mp. or Medical Records Systems, Computerized/ or patient records.mp. or patient medical history.mp. or doctor–patient communication.mp. or doctor–patient interaction.mp. or professional knowledge.mp. or physician- patient relations.mp. or Physician–Patient Relations/ or Health Knowledge, Attitudes, Practice/ or lay knowledge.mp.
Establishment and maintenance	Establish$ Maint$ Develop$
Dimensions	Dimension$ Aspect$ Level$

Box 1. Results of search strategy.

IDENTIFICATION
193 articles sourced from 5 databases

↓

TITLE and ABSTRACT REVIEW
57 selected for full review
136 excluded

↓

ARTICLE REVIEW
34 included
23 excluded (20 did not contain needed
elements, 3 unobtainable)

↓

OUTCOME
34 articles accepted for review

example, commentaries and review articles) in this review. These pieces were often written by leaders in the field of continuity; the researchers therefore felt justified in including information extracted from these articles in the review. The work for 15 articles was undertaken in the UK, 12 in the US, three in Canada, and one each in Malaysia, Australia, Norway, and the Netherlands. The reviewed articles are summarised in Table 2.

The systematic review revealed important but scattered details about the development and use of informational continuity of care within family practice. These are presented next under the themes that arose from the article review.

Nature of the continuous record
In primary care, the medical record forms the basis upon which informational continuity of care is built. This record is constructed using 'mature information' (that is historical medical information as opposed to current information only),[41] and established throughout multiple consultations over time with the patient and his or her family.[28,30,41] Information can be stored in paper records, electronically, or in practitioners' memories. Computerised (for example, electronic medical records [EMRs]) and paper records store different types of information.[20] Informational continuity may be better when doctors have to 'hand over' records to other care providers, otherwise they may rely on memory alone.[41] While GPs are traditionally medical information coordinators, nurses or receptionists are also involved in developing informational continuity of care because of their roles in record keeping.[16]

Importance of the doctor's memory
Although GPs frequently use recorded information,

they also use remembered information to produce better health outcomes for the patient,[25] and enhance the effectiveness of their care.[29,31] They draw specifically on their own stored knowledge of patients' medical histories and social/lifestyle circumstances.[30] Importantly, the duration and depth of the doctor–patient relationship shapes information transfer and record keeping, taking at least a few years to establish a good knowledge base.[14] Such a knowledge base, and the use of remembered information, is particularly important at extremes of life, including in the palliative care context.[32] Having informational continuity of care is also useful when treating patients experiencing mental illness,[31] and psychological disorders.[21] Here, lack of specific knowledge has been regarded as a hindrance to patient management.[21] Another general hindrance is that doctors typically ask long-term patients for details of their medical histories and social/lifestyle circumstances only on rare occasions,[9] which leaves them without such details to store as remembered information.

Patient input into recorded information
The duration and depth of the doctor–patient relationship shapes information transfer and record keeping, taking at least a few years to establish a good knowledge base.[14] Patient input into record keeping is normal. Actually, 30% of patients enjoy discussing what is to be entered into their records.[17] Such input may also be given in written form. New patients, for example, may complete their own medical history form for inclusion in their record.[9] During periods when the formal record cannot be accessed (for example, during file transfer between clinics), a patient's own notes may be particularly welcomed.[42] However, patients often select information about what they believe is important to be recorded, typically prioritising biomedical factors over socio-contextual or personal ones.[18,34] It is not clear, in general, how well a patient's own augmentative notes will be received by his/her doctor.[16,30,32]

DISCUSSION
This systematic review reveals that informational continuity of care can be best developed using paper and electronic records and remembered information Although GPs have input, patients and practice staff also contribute to its development. Patients may want to have more of a say in what information gets recorded, but there is little opportunity for this unless asked for specifically by a practitioner — something that may jeopardise developing informational continuity of care. Other obstacles to developing continuity of care identified by the review include:

Table 2. Reviewed articles (opinion-based conceptual articles (for example, essays, commentaries, reviews, editorials) are indicated by italics.

Author(s), year published	Study design	Main points for informational continuity
Aaronson *et al*, 2001[12]	Qualitative survey of 219 family medicine residency directors	41% of respondents said EMRs negatively affected interactions with patients. Historical patient information is used for health maintenance/laboratory flags/problem medication/patient lists.
Bertakis and Callahan, 1992[9]	Cross-sectional observations of doctor–patient interactions in a university family practice; 47 interactions with established patients, 36 with new patients; interactions analysed	Doctors typically ask information of established patients using valiated Davis Observation Code only when it is relevant to a new medical problem. There is less discussion of patients' family information in established patient visits.
Burt *et al*, 2004[13]	Qualitative retrospective audit of GP communications from 13 460 patient consultations in palliative care situations	Updating patient information is central to the doctor's role. A lack of informational continuity negatively impacts on palliative care specifically.
Desguin et al, *1994[30]*	*Conceptual*	*Families should keep information on prescriptions and health conditions. Nurses can assist with updating medical records. Medical records are important to illness management. Recording social/familial information in EMRs is important.*
Errington, 1974[31]	*Conceptual*	*Knowing a patient's peers or social group helps with understanding his/her health problems. Repeated patient visits build a cumulative picture of patients' psycho-social context for future medical care. Having access to information from previous GPs is vital to making primary care effective.*
Freeman, 1984[32]	*Conceptual*	*Informational continuity is better when doctors 'hand over' records. Relying on memory alone for patient information may not be a good strategy. Rather, memory is an aid for consistency along with medical record. There is no consistency in how much information recorded in a patient's record.*
Freeman et al, *2003[33]*	*Conceptual*	*Having informational continuity can overcome the negative outcomes of lacking interpersonal continuity of care. Sometimes doctor and patient want a fresh start with regard to informational continuity (that is, a new record). Some GPs may deliberately not record contextual information so that s/he becomes the sole keeper of this information. Continuity is still maintained, with that practitioner only.*
Freer, 1980[34]	*Conceptual*	*Patient health diaries used in research have been found to be more efficient than retrospective health interviews. It may be possible to use health diaries clinically, but the methods for doing this remain unclear.*
Guthrie and Wyke, 2000[35]	*Conceptual*	*Continuity is enhanced by the use of EMRs. Chronically ill patients typically spend ten minutes explaining their health history to new GPs. Personal continuity is defined as the ongoing doctor–patient relationship and it ensures care takes account of a patient's personal/social context.*
Hamilton *et al*, 2003[20]	Cross-sectional retrospective case-control with cancer patients from 21 general practices	Computerised and paper records record different types of patient information. For example, some computer systems have little 'free space' for contextual material. Accurate records are especially needed in case of patient complaints or legal action. Information and patient follow-ups can be lost if there is no personal continuity. A hybrid system of paper records and computer records is more comprehensive (computer records have more telephone conversations recorded, paper charts have more home visits and symptoms recorded).
Hegan, 2003[36]	*Conceptual*	*Medical records are important as they ensure past consultations can be communicated. They should allow the person reading to re-construct the event. Effective communication with colleagues is needed for continuity of care between practitioners.*
Hennen, 1975[37]	*Conceptual*	*Continuity of information is vital in cementing the interprofessional relationships in the office (as different professionals see patients). The medical record is the key to this.*
Hjortdahl *et al*, 1992[14]	Qualitative survey of 133 GPs	Prior knowledge of a patient (for example, about medical history, personality, social network) affects decision making. GPs are information coordinators. The duration and depth of doctor–patient relationship shapes accumulated knowledge; it takes at least a few years (1–5 years) to establish a good knowledge base.

Table 2 continued. Reviewed articles (opinion-based conceptual articles (for example, essays, commentaries, reviews, editorials) are indicated by italics.

Hjortdahl, 1992[21]	Survey of 133 GPs after doctor–patient interaction	A doctor's prior knowledge of patient assists with decision making. For example, prior knowledge is 'helpful' in 44% of cases, 'useful' in 66% of cases, and a 'great help' in 30%. In 8% of cases a lack of knowledge was deemed a 'hindrance'.
Hjortdahl, 2001[38]	*Conceptual*	*Continuity builds relationships between doctor and patient. The patient needs to trust the doctor in order to establish continuity. Continuity may be used to develop a doctor's clinical knowledge/skills. Informational continuity is unlikely to replace interpersonal continuity of care. Doctors possess integrated knowledge gathered over time.*
Kearley *et al*, 2001[22]	Qualitative interviews and cross-sectional survey of 996 patients and 284 doctors in 18 practices	Informational continuity cannot replace interpersonal continuity in the delivery of quality of care.
Kibbe et al, *2004[39]*	*Conceptual*	*A patient's memory is sometimes needed when reassembling information missing from the recorded record. Patients can relay EMRs between physicians. Continuous connectivity between patients, families, and doctors is an element of continuity. A portable, patient-held record (on smart-card or USB) can be a source of empowerment.*
Kravitz *et al*, 1993[23]	Cross-sectional survey (database data) of 1751 patients	Patients may not remember accurately what they have been told by doctors. For example, >90% of respondents remembered to take medications. Fewer remembered being told about diet and lifestyle advice. Therefore, patients' memories may be selective.
Lester *et al*, 2003[24]	Cluster randomised controlled trial of 201 patients	The patient-held record is valued as a communication tool, particularly by patients with chronic stable schizophrenia. Patient-held records did not improve outcomes for patients with schizophrenia, although caseworkers/GPs found them useful.
Liaw *et al*, 1992[15]	Two focus groups held with 21 randomly selected patients from family practice and walk-in clinics	Sharing information assists in establishing interpersonal continuity. Though personal qualities and competence of a doctor are important, patients felt it did not matter who the doctor was as long as medical records were available to ensure consistency. Ten patients wanted to see a regular GP who knows their personal/medical histories.
Litaker *et al*, 2005[25]	Survey of retrospective cohort of a specific patient group of 3718 patients	Informational continuity provides a knowledge base accessible to all clinicians, ideally through a single electronic record accessible to all healthcare providers.
Mandl et al, *2001[40]*	*Conceptual*	*Feelings of privacy and control will enhance a patient's sharing of information during an appointment.*
Moore and Busing, 1993[6]	Qualitative survey of 13 family medicine residency programme directors	A nurse/receptionist who coordinates information/appointments is to be the most important person in establishing continuity from the patient's view. Computer records summarise patient history/previous care.
Parchman *et al*, 2002[26]	Time series (cross-sectional prospective cohort) of 256 patients	With increasing continuity, trust in doctors increases and patients are more likely to divulge information regarding the social context relevant to health. Patient recall varies according to the outcomes of the previous consultation. For example, certain recommendations made by the doctor are more or less likely to be remembered. This could influence whether or not patients give correct information to their doctors.
Risdale and Hudd, 1994[17]	Qualitative interviews with 39 patients	Computers are an efficient tool for quickly accessing information and for cross-referencing. Information is accessed in computerised records faster than in hand-held ones.
Risdale and Hudd, 1997[18]	Qualitative interviews with 30 patients from a specific clinic	Patients have views about what information they see as needed for the EMRs. Lifestyle information and biological risk factors are appropriate. Personal comments and serious illness are not, unless discussed in advance (mental illness is also a concern). Doctors need to develop ways patients can evaluate and access their information.
Rogers and Curtis, 1980[41]	*Conceptual*	*Mature knowledge pertains to information built up about the patient and his/her family. Telecommunications should be recorded on a patient's record. The patient is more likely to disclose personal information when s/he has an established record with the doctor. The patient's willingness to provide important contextual and health information is implicit with the goal of creating continuity of care.*

Table 2 continued. Reviewed articles (opinion-based conceptual articles (for example, essays, commentaries, reviews, editorials) are indicated by italics.

Rowan *et al*, 2002[27]	Cross-sectional survey of 134 family medicine preceptors	Coordinated medical records are important and enhance physicians' abilities to recognise information about patients' problems/therapies; problem lists, medical lists and computers help this. Looking at the correlation with longitudinality of relationships, coordinated medical records overall scored R2 0.0639, compared with, R2 0.1168 (regular medical records). GPs may need computer training to enhance informational continuity of care.
Schers *et al*, 2003[28]	Cross-sectional postal survey of 873 family practice patients	Use of the computer as an information storage system may lead to more people having access to the information than the patient wants. Because of this, patients may withhold information or not disclose as much. Patients agreed that most aspects of their health histories were important for their personal GP to know, and should be accessible to the on-call GP. Older patients were more comfortable with multiple points of access to medical records. Doubts about the confidentiality of the practice may lead the patient to confide in their GP less. Access to private information should be given by patients to certain staff members. The doctor is not the only person seeing records; because of this, there may be no control over confidentiality in larger practices.
Starfield *et al*, 1976[29]	Random chart pulls of 200 patients	Recording certain types of information enhances the effectiveness of care. Medical records are superior to doctors' recollections.
Starfield *et al*, 1979[10]	Observations of doctor–patient interactions and chart pulls of 104 patients with return visits scheduled	Physicians routinely do not record certain types of information. Quality of the medical record is linked to the quality of care. Doctors are likely to recall important issues recorded on the health record.
The Bolton Research Group, 2000[19]	Qualitative survey of 756 patients in 10 group practice clinics	Confidentiality allows patients to share information with doctors. Patients believed that GPs should act as gatekeepers of the medical record.
Thompson, 1989[42]	*Conceptual*	*Patients should have their own summary of their chart to use when travelling, when switching doctors, and when seeking acute care. The doctor should establish a patient-based record, so that when admission/ intervention is needed, all the information will be there. Sometimes 6 months can elapse between the new GP getting records in a transfer situation.*
Toms, 1977[11]	Multi-qualitative method and cross-sectional case study of 30 families who had lost their family doctors	It may fall to the patient to ensure getting records transferred and thus ultimately getting continuity. There is no 'usual practice' of transferral of practice — each doctor is left to decide how this should be done.

practitioners not recording information shared by patients in the form of notes or information transmitted verbally; patients not disclosing important details, due to lack of knowledge about what practitioners perceive as important; and practitioners not asking about patients' lifestyles often enough. There may be reasons as to why these events are not occurring as frequently as they should, such as time pressures encountered by practitioners, the complexity of cases, and clinic procedure issues.

Patients' lifestyle and psychosocial information, though important for many reasons, is difficult to systematically store in the permanent record and may be more easily held as remembered information. If this is the case, then more suitable venues for storing this information should be developed that are easy to access and update. Education could assist patients with determining what lifestyle and psychosocial information to share with practitioners, including that which is specific to particular health conditions. Practitioners having greater ease of access to this information, including by request and also that which is offered up-front by patients, could assist in the improvement of informational continuity of care.

Despite the increasing desire to shift to computerised medical information storage via the EMR in many health systems, the impact of this on informational continuity of care has yet to be fully explored. Although computerised records are clearly helpful in situations where there are many care providers, as has been pointed out above, such records may not be able to capture all the nuances of hand-held and remembered information in an easily retrievable way. Furthermore, the authors' own research with chronically ill patients and their caregivers has revealed that the use of computers during consultations for purposes such as accessing EMRs could negatively affect both the conversational

flow and, ultimately, information sharing.[43] Specifically, recording information on computers during consultations was thought to lead to more-impersonal interactions. This clearly has negative implications for the development of informational continuity of care. Given the lack of consideration paid to this issue in the reviewed articles, this is an important area for further exploration.

Given that the population of the Western world is aging,[44] that we are burdened by more chronic and psychosocial disease,[44,45] and the knowledge that informational continuity of care is particularly important in psychosocial, complex, and palliative care situations, newer clinic arrangements not attentive to the development of such continuity could be problematic. In clinics where patients are seen by different practitioners who do not have access to long-term remembered information, the provision of quality care to these populations, and others, may be challenged. Although attempts are being made to improve access to primary care,[46] mandating that patients see multiple providers may be hindering the delivery of quality care. However, this has not been extensively researched. Future research should therefore look at the quality of informational continuity in various care settings from both providers' and patients' perspectives, in different models of healthcare delivery.

Ultimately, the doctor–patient relationship still remains the main vehicle that facilitates information transfer and the development of informational continuity of care in general practice. New models of care that facilitate and not hinder its development within general practice must be encouraged and developed.

Ethical approval
McMaster University Health Sciences Research Ethics Board Approval (06–173)

Competing interests
The authors have stated that there are none.

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