Breaks in continuity of care and the rural senior transferred for medical care under regionalisation

H. Jay Biem, MD, MSc, FRCP(C), Division of General Internal Medicine & Institute for Agricultural, Rural and Environmental Health, University of Saskatchewan

H. Hadjistavropoulos, PhD, R Psych, Department of Psychology, University of Regina & Clinical Research and Development Program, Regina Health District

Debra Morgan, PhD, RN, Institute for Agricultural, Rural and Environmental Health, University of Saskatchewan

Henry B. Biem, MD, CCFP, Family Physician, Edmonton AB

Raymond W. Pong, PhD, Centre for Rural and Northern Health Research, Laurentian University, Sudbury, ON

Correspondence to: Dr. J. Biem, Department of Medicine, University of Saskatchewan, 103 Hospital Drive, Saskatoon SK S7N 0W8. Phone: 306-966-7951, Fax: 306-966-2383, E-mail: biem@skyway.usask.ca

Abstract

Continuity of care, defined as the patient experiencing coherent care over time and place, is challenged when a rural senior with multiple medical problems is transferred to a regional hospital for acute care. From an illustrative case of an older patient with pneumonia and atrial fibrillation, we catalogue potential breaks in continuity of care. Optimal continuity of care is characterised not only by regular contact with the providers who establish collaboration with patients and their caregivers, but also by communication, co-ordination, contingency, convenience, and consistency. Because it is not possible to have the same providers continuously available (relational continuity), for continuity of care, there is a need for integrative system approaches, such as: (1) policy and standards, disease management programs, integrated clinical pathways (management continuity), (2) electronic health information systems and telecommunications technology (communication continuity). The evaluation of these approaches requires measures that account for the multi-faceted nature of continuity of care.

Keywords

continuity of care, patient, rural, tertiary centre, quality of care, co-ordination, integrated care

Introduction

Continuity of care is essential for quality of care, but its importance may be unrecognised [1]. Continuity of care has been confusing because it means different things to different people. Traditionally, it has been defined by care by a family physician [2–4]; however, modern health care depends on a variety of service providers in different settings over time. Thus, continuity of care has been defined more broadly [5], and as has come to signify coherent health care with a seamless transition over time between various providers in different settings. Reid et al. [6] described three components of continuity of care: relational (ongoing patient-provider relationships), management (co-ordination of care), and informational (information transfer). Given the complexity of modern health care, it is not surprising that there are many potential breaks in continuity of care.

Assuring continuity of care for an older patient with both acute and chronic conditions is challenging, and especially so for rural patients [7]. About one third of Canadians live in rural areas as defined by the OECD (less than 150 inhabitants per square kilometre); in Saskatchewan the population is even more rural with about 60% of living in rural areas [8, 9]. The challenge of continuity of care for rural seniors may be increasing for several reasons. First, many diseases now have evidence-based therapies needing regular monitoring and careful follow-up [10]. Second, the rural population is ageing. There is an increasing ‘old age dependency ratio,’ i.e. the population age 65 years and older as a percent of the population age 15–64 [11]. Third, health care providers are unevenly distributed in rural areas [12]. Fourth, closure of rural hospitals, as a part of regionalisation in health care delivery, makes transfer to regional centres necessary [13]. Fifth, at acute care centres, there have been decreases in average
length of hospital stays and increases in average patient acuity [14].

Based on our experiences in caring for rural seniors, case conferences with a variety of health care groups, and review of relevant publications, we discuss a case scenario illustrating the multi-faceted nature of continuity of care. Using the ‘quality grand rounds’ format [15], we catalogue breaks in continuity of care. Such a catalogue may be useful for improving continuity of care [16]. The aim of this paper is to characterise continuity of care in order to measure and improve quality of care and health outcomes. (For our illustrative case, we developed a case scenario based on an actual case with some additional features taken from two others. Our catalogue of breaks in continuity of care was compiled from discussions with a variety of audiences: family medicine, internal medicine, neurology, cardiology, quality of care committee, and provincial collaborative group for integrated care pathways (health services researchers, administrators and multidisciplinary providers). All rounds were presented by HJB during a two-year period in 2001–2003. All rounds began with the case presentation during which attendees were asked: ‘What went wrong?’ and ‘What are potential solutions?’ Attendees responded orally and/or by hand-in notes.)

Case

A 75-year-old man with a history of type 2 diabetes, hypertension and osteoarthritis is transferred to a regional tertiary care centre with acute stroke. He has a right-sided hemiparesis and dysphasia. He has atrial fibrillation but was not on warfarin therapy. Review of his chart showed that he had atrial fibrillation when he was admitted with pneumonia the year before.

Quality of care is receiving widespread attention [17–19] and means getting the right effect (patient outcome and satisfaction) by providing the right service (process), at the right time and place (access), and for the right price (efficiency). Failure of our patient to receive warfarin anticoagulation reflects a quality of care problem; chronic warfarin therapy, maintaining the INR (international normalised ratio) between 2 and 3, reduces the risk of cardioembolic stroke from atrial fibrillation by two thirds [20]. This quality of care problem is common worldwide, in some series, less than half of eligible patients receive warfarin [21–26]. Barriers to anticoagulation have been classified according to the patient, provider and system [27]. Improving health care entails changing systems to meet the needs of patients not organisations [28].

On a Monday one year before, our patient presented to a rural health care centre with cough. He was on metformin for diabetes, enalapril for hypertension, and ibuprofen for osteoarthritis. On exam, he had breathlessness and fever. He had an irregular, fast pulse and chest crackles. The white cell count was elevated, the chest radiograph showed a right middle lobe pneumonia, and the electrocardiogram showed atrial fibrillation with fast ventricular response. He received oxygen, cefuroxime and digoxin. Because acute care beds had been closed at the local hospital, he was transferred to a regional care hospital three hours away.

Our patient required complex medical care. He had an acute severe illness (pneumonia) superimposed on pre-existent (diabetes, hypertension, osteoarthritis) and newly diagnosed (atrial fibrillation) chronic problems. This patient required several medications and regular follow-up. Under regionalisation, rural patients are being transferred to referral centres for acute care. Regional centres may have better patient outcomes [29–32], and cut health care delivery costs because of higher volumes.

While in the regional hospital, the patient was seen by a resident in the emergency room and by a senior medical student supervised by an attending internist on the wards. He was in an off-service bed for one day before being transferred to a medical ward. He improved but remained in atrial fibrillation. A pharmacist gave him information on warfarin for stroke prevention. He was told that if his INR was less than 2.0, the warfarin would not be effective and that if his INR was greater than 3.0, the warfarin could cause bleeding. His wife, who managed his medications, was too frail for travel to visit him. On Friday, the patient was feeling better and had an INR of 2.0. He was discharged home with a one-week course of oral cefuroxime. He was to remain on metformin, enalapril, digoxin, and warfarin. He was told to make an appointment the next day with a physician for INR testing.

Breaks in contact occur during patient transfer between providers and between settings, which can occur at patient admission [33], during hospitalisation (nursing shift change and inter-facility transfer [16]), or at discharge [34,35]. Such transitions at night-time and on weekends may increase mortality [36–38]. Hospital care involves a team of nurses and physicians supported by pharmacists, physiotherapists, occupational therapists, and home care nurses [39]. Increasingly, nurses no longer provide primary care for inpatients, but rather must dispense medications and look after only the sickest of patients. Because of nurse and bed shortages, managers call physicians to ‘encourage’ patient discharge. Providers may have limited time for patient education and arranging follow-up. Care for chronic illness usually relies on the patient...
and/or caregiver having sufficient education and training. In one study, one third of patients left hospital with an incomplete understanding of their medication [34]. For our patient, involvement of the caregiver was essential but did not occur because of distance to travel.

The weekend locum physician received a hand-written discharge letter listing the patient’s diagnosis and medications. The repeat INR was 2.8. The physician instructed the patient to stay on the same dose and see his family doctor on Monday for repeat INR testing.

Many rural seniors have limited local access to health care services [40]. Although patients are more satisfied by having their own physician [41], many patients see more than one family physician per year [42]. Although rural physician numbers have increased modestly in recent years [43], their distribution is still uneven [44]. Locum physicians are needed to provide relief on weekends. Timely and concise discharge communication needs to be available to local providers detailing the diagnosis, care plan and medications [45]. Failure to provide this can contribute to hospital re-admission [46]. Transcribed narrative discharge summaries may not arrive before the first follow-up visit [47]. Hand-written discharge letters may be illegible and provide insufficient information. In an Australian study, 87% of 203 recently hospitalised patients were considered by their follow-up physicians to have inadequate documentation of discharge medications [34]. For our patient, the locum physician would have also benefited from having INR values from the previous few days. Had he known that the INR was already increasing, he might have prescribed a lower warfarin dose.

At home, the patient took ibuprofen for hip osteoarthritis as well as some herbal pills. On Sunday evening, his wife worried about his bleeding after glucose finger-stick testing. She called the regional health care centre and spoke with the internist on-call, who did not have access to recent health records. He recommended the patient to see his family doctor for INR testing. On Monday, when the patient saw his regular family physician, the INR was 4.8. The patient was advised to take acetaminophen, instead of ibuprofen, and stop the herbal pills. He was to hold the warfarin and have his INR tested the next day. Because of arthritis, the patient found it difficult to travel to town for INR testing. His wife thought he was on too many medications. At his next clinic appointment, he refused further warfarin but did accept aspirin therapy.

Our patient was on a number of drugs that could interact with warfarin, which has a narrow therapeutic index and potentially life-threatening adverse effects. For example, antibiotics decrease the warfarin dose needed [48]. A variety of herbal products (e.g. ginkgo biloba, garlic, dong quai, danshen) affect the INR [49]. The home situation (home alone, family caregiver, supervised setting, or long-term institution) may affect continuity of care. Seniors with able caregivers may have better continuity of care [50]. Patient factors such as age, education, and functional capacity affect care [51]. Psychological factors (e.g. depression) may influence a patient’s ability to adhere to the care plan [52]. Lack of availability of a health care provider to answer questions and concerns after hours may affect continuity of care. When providers do not have background health information or treatment plan, they may not be able to give appropriate advice. In the end, our patient had a challenging home situation and was inconvenienced by travel for INR testing; his family physician was not convinced that warfarin therapy was worthwhile.

The seven c’s of continuity of care

For our patient, we believe continuity of care was a major issue. From discussions of this case during rounds, we compiled a list of potential breaks in continuity of care for our patient along with potential solutions. We categorised these in relation to the illness, the patient, the local provider, the regional care centre, and the health care system (Tables 1–5). What are the characteristics of optimal continuity of care? These can be summarised alliteratively by the seven c’s (Table 6).

Contact

Our patient had contact with many different providers over a one-week period. Irregular contact may make it difficult to build trust in patient-provider relationships. Strong relationships may improve adherence to treatment regimens [53]. Regular contact allows the provider to know the patient well and monitor patient progress [54]. Patients prefer to have their own personal physician [55]. Increasing attention is being paid to retention of health care providers in rural areas, but this has been a vexing problem [56]. Canada is opening its first rural medical school [57]. Rural nurse practitioners may play a role [58]. Tele-health may be a way of improving access for rural patients [59].

Collaboration

In collaborative management, patients and their caregivers become self-reliant by education [60] and maintain responsibility for health information and self-management. Our patient and his wife caregiver did not receive sufficient patient education. Decision-aids
Table 1. Illness factors challenging continuity of care

| Challenges to continuity | Case scenario | Potential solutions |
|--------------------------|--------------|---------------------|
| Chronic illness          | Atrial fibrillation, diabetes | Clinical practice guidelines |
| Complex management       | Failure to carry out an evidence-based treatment in which benefit outweighs risks | Patients and providers require access to information: patient counselling, educational material, pharmacist teaching or Internet resources |
| Complex regimen          | Polypharmacy | Use of once a day and combination preparations where possible |
|                         | Warfarin treatment, narrow therapeutic index, minor and major side effects | Pharmacist assistance |
| Side effects             | Minor bleeding with warfarin | Information about side effects and what to do if occur |
| Drug interactions        | Herbal and ibuprofen | Pharmacists, nurses, and physicians are aware of complete medication list |
|                         |                         | Automated drug interaction detection |
|                         |                         | Patient education regarding potential drug interactions including over-the-counter and herbals |
| Co-morbidity             | Co-existent hypertension, diabetes, osteo-arthritis | Allow for greater clinic contact time and remuneration for care of patient with multiple medical problems |

may allow patients to better participate in decision-making [61]. Patients need to learn about activity restrictions, dietary changes, warning symptoms, possible side effects, and time-lines for follow-up. They must make providers aware of their use of alternative treatments, such as herbal products, which may cause drug interactions.

**Communication**

Our patient experienced many transitions between providers and settings. In hospital, communication between providers (e.g. nursing station sign-over and multi-disciplinary rounds) is needed for continuity of care during transfer of responsibility in place and time. Now taken for granted, the health record was a major advance in continuity of care, documenting health information for providers over time. The record also transfers information between different providers. On hospital discharge, the discharge summary supports informational continuity. Some centres have developed automated discharge summaries [62]. Family physicians prefer standardised discharge summaries [63]. Fax [64] or telephone [65] communication may improve continuity of care at discharge. Electronic health records may eventually improve transfer of information between settings [66, 67] but have not yet reached widespread use for hospitalised patients [68].

**Co-ordination**

A large multidisciplinary team cared for our patient. Continuity of care is based on teamwork [69]. With the division of labour, comes the need to co-ordinate efforts. This co-ordination may be accomplished by documentation (care plans) and/or by dedicated personnel (e.g. discharge co-ordinators). Such personnel oversee the completeness and clarity of information and assess the consistency of the care plan.

**Contingency**

Our patient and his caregiver had concerns after discharge home. For continuity, patients need timely access providers for urgent questions, worsening symptoms or complications. After-hours care by pri-
Table 2. Patient factors challenging continuity of care

| Challenges to continuity | Case scenario                                                                 | Potential solutions |
|--------------------------|-----------------------------------------------------------------------------|---------------------|
| Poor comprehension       | Lack of understanding of multiple conditions requiring monitoring           | Standardised and clear patient education |
|                          |                                                                             | Caregiver education  |
|                          |                                                                             | Home care support   |
| Immobility               | Difficulty getting to lab                                                   | Home lab visits     |
|                          |                                                                             | Telephone or tele-health visits |
|                          |                                                                             | Self-monitoring with home INR testing |
| Fear                     | Fear of medication and polypharmacy                                        | Standardised and clear patient education |
| Lack of interest/attention/concern/motivation | Patient not committed to anticoagulation                          | Provide education and encouragement to make it easier for the patient and provider to do the right thing |
| Cognitive dysfunction – dementia or delirium | Acute illness with delirium may interfere with ability to understand or remember medication | Written information |
|                          |                                                                             | Education of caregivers and or community providers either in person or over phone |
| Lack of social support   | Wife not able to travel to regional care centre                             | Provide caregiver support |
|                          |                                                                             | Provide information regarding community resources |
|                          |                                                                             | Tele-health visit for wife to review medication information |

mary care providers may improve continuity [70]. Primary health care reform holds promise to give better round-the-clock access to multi-disciplinary providers, who are members of health care teams [71].

**Convenience**

Our patient had difficulty getting to the hospital for INR testing. The convenience of home INR testing [72, 73] may have helped our patient stay on the warfarin. Inconvenience related to parking, office waits, and, especially for rural patients, distance travel can decrease access to health care [70]. Continuity of care can make care more pleasant for patients because the system has ‘memory’ of the patient, so that patients need not keep repeating the same information to providers. Care can be individualised if patients’ values and preferences are known.

**Consistency**

Our patient’s local physician may have been ambivalent about warfarin therapy for his older patient. Consistency avoids conflicting advice from providers. Continuing medical education [74, 75] and guidelines [76] attempt to improve the consistency of care given by various providers. For example, although age and fall risk may cause physicians to hesitate about anticoagulation in seniors, this age group benefits substantially [77]. Bleeding risk is related more to the lack of control of the INR than it is to age [78].

Verification of patient and provider understanding of the recommended care plan can improve consistency. For example, prior to discharge, the tertiary care centre needs to ensure that both patients (and caregivers, if necessary) and the accepting physicians have an understanding of the condition and care plan. Both need to have an opportunity to ask questions. Checklists, protocols, and flow sheets may support the processes of care [79]. However, scarce resources, heavy workload and a lack of financial incentives for quality of care may impede such strategies [80].

**System approaches to improving continuity of care**

Because continuity of care is multi-faceted, improvement may be best accomplished by a combination of
Table 3. Local provider factors challenging continuity of care

| Challenges to continuity | Case scenario                                                                 | Potential solutions                                                                 |
|-------------------------|-------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|
| Closure of local hospitals | Family doctor not able to provide acute care or visit patient in hospital   | Co-ordinators required to ensure proper transfer of information to and from tertiary centres |
| Communication breakdown  | Confusion about whom to call in case concerns and complications.             | Develop standards or procedures for communication to and from tertiary centres        |
| Turnover of physicians and nurses in local Centres | Locum physicians                                                               | Communication of most responsible provider                                           |
| Lack of understanding of medication rationale | Lack of personnel or time for patient education                              | Access to electronic health records for medical history                              |
| Disagreement with treatment recommended by regional providers | Lack of familiarity with evidence for warfarin therapy | Provide guidelines on which treatment decisions are based in transfer documentation | Telephone contact for discussion between local providers and consultants |

several possible approaches [81, 82]. For example, for warfarin therapy in seniors, a randomised controlled trial showed that a multi-component intervention decreased the risk of major bleeding [83]. According to the WHO position paper, integrated care is the ‘concept bringing together inputs, delivery, management and organisation of services related to diagnosis, treatment, care, rehabilitation and health promotion. Integration is a means to improve the services in relation to access, quality, user satisfaction and efficiency’ [84]. Integrated health care seeks connectivity, alignment and collaboration between sectors [85], which increases continuity.

Guidelines, policy and standards may be used to standardise processes for communication, co-ordination and consistency of health care. For example, guidelines exist for anticoagulation [86]. Rural family physicians are favourably disposed to guidelines, but would like to participate in their development [87]. Guidelines are important but insufficient for changing practice behaviour [88]. Clinicians may be overwhelmed with guidelines, which are of varying quality [89]. Policies and standards can enforce guidelines about communication and co-ordination of care; however, they are insufficient alone when providers lack resources.

Disease management has programs with four features: integrated health care delivery across the continuum, comprehensive knowledge base for prevention, diagnosis, treatment and palliation, clinical and administrative information systems, and continuous quality improvement. Disease management programs use a variety of interventions to improve provider adherence to guidelines including patient education, provider education, provider feedback, reminders and incentives [90]. Such programs have dedicated personnel overseeing the co-ordination and consistency of care [91]. For our patient, anticoagulation clinics have been established with the goal of improving quality, safety and ease of warfarin anticoagulation [92, 93]. Some clinics are staffed by pharmacists [94, 95] and some by nurses using computerised decision support and point-of-care testing [96]. Some clinics use in-person visits and some, telephone management [97].

Clinical pathways offer a similar approach to improving continuity of care [98, 99]. Based on clinical practice guidelines, patient education material, or prediction rules, clinical pathways are time-task care plans that foster multidisciplinary communication and co-ordination across time and place. The strongest evidence for the effectiveness of clinical pathways comes from
Table 4. Regional centre factors challenging continuity of care

| Challenges to continuity                                      | Case scenario                                                                 | Potential solutions                                                                 |
|---------------------------------------------------------------|-------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Large team of house staff and attending at teaching hospital  | Different physicians admission and on discharge                               | Sign-over                                                                          |
| Failure to list medications/ failure to use medication aids   | Failure to get complete list of medications including herbals                   | Complete list of medications                                                         |
| Shortening hospital stay so there is limited time for discharge preparation and education | Nurse shortage                                                                | Avoid discharge without adequate preparation for discharge for complex patients      |
|                                                               | Bed shortage                                                                   | Discharge patient only after education checklist is complete                        |
|                                                               | Overworked nurses                                                              | Assign education roles to specific providers                                         |
|                                                               | High acuity patients                                                           |                                                                                    |
| House staff and physicians are sleep deprived                 | Busy clinical teaching unit                                                    | Attention to shift scheduling and workload                                           |
| Bed shortages mean transfer of patients to home hospital on short notice | Bed shortages                                                                 | Transfer of care plan among providers                                                |
| Inadequate transfer of information                            | Time delays in discharge summaries                                              | Telephone contact between attending and local provider                              |
|                                                               | Insufficient information                                                        | Confirm receipt of information                                                       |
|                                                               | Excessive detail                                                                | Electronic medical records Faxed or emailed discharge summaries                    |
| Lack of structured procedures for information sharing         | No individual responsible for ensuring appropriate transfer of information      | Develop integrated care pathways that specify roles and responsibilities of providers in continuum of care |
|                                                               |                                                                                | Designated personnel responsible for transitions                                    |

a cluster randomised control trial for the management of pneumonia, in which 19 teaching and community hospitals were randomised to either usual care or a pathway. Patients were followed for six weeks; patients on the pathway had shortened hospital stays with no difference in clinical outcomes [100]. Funded by the Canadian Health Services Research Foundation, we are currently evaluating an integrated pathway aimed at improving continuity of care for patients discharged home on anticoagulation.

Electronic health information and telecommunications technology may give providers and patients access to health information and improve co-ordination of health care [101]. Electronic records, accessible over the Internet, may help; however, many rural areas and remote areas do not have high speed access and therefore, rely on telephone lines. Tele-medicine is expanding but still plays an uneven and limited role in rural health care [59, 102].

Measuring continuity of care

Because continuity of care is multi-faceted, it needs to be assessed from different perspectives [103]. For the patient’s perspective, various questionnaires and satisfaction surveys have been developed to assess contact, collaboration, communication, contingency, convenience and consistency [104]. For example, the Care Continuity Index [105] was designed to assess the continuity of care received by seniors in their preparation for discharge from hospital and the care received post-discharge. The Care Transition Measure [106] was recently developed to assess the patient’s views on quality of care transition. We have developed a disease-specific questionnaire for cardiac patients [107]. For the local provider’s perspective, chart audits and surveys can assess contact, collaboration [34], and communication [45, 46]. For the system’s perspective, chart audits, administrative database...
Table 5. Health system factors challenging continuity of care

| Challenge to continuity | Case scenario | Potential solution |
|-------------------------|--------------|-------------------|
| Distance                | Regionalisation with separation of local providers, patients and regional centres | Planning to avoid long distance transfers, closest centre, co-ordination of follow-up visits |
| Lack of attention to quality improvement | Lack of resources to focus on quality | Linkage of monitoring with improvement |
|                         | Lack of recognition of problem | Funding and personnel support of projects aimed at quality and continuity of care |
|                         | laboratory results are not available to local provider | Liaison between rural and referral centres for discussion of issues |
|                         |                                             | Monitoring processes, outcomes and satisfaction |
| Lack of integrated health information systems |                                             | Integrated electronic health records with lab results, discharge summaries and care plans |

analysis, and cohort studies for documentation, service utilisation (e.g. readmissions), medication usage, and health outcomes (e.g. morbidity and mortality) may provide measures of the consistency of care [108, 109]. More research is needed on how to best measure continuity of care during transitions within the health care system.

Given variation in health care delivery [80] we believe more research on continuity of care is needed that considers the various perspectives (patients, providers, health care system), components (relational, management and informational) [6], characteristics (contact, collaboration, communication, co-ordination, convenience, contingency and consistency), observational methods (patient and provider interviews, clinic and hospital chart audits, administrative database analysis, and controlled studies), and integrative system interventions (policy and standards, disease management programs, integrated clinical pathways, electronic health information systems and telecommunications technology). To determine the effectiveness of such interventions, we need prospective, controlled studies using validated and responsive measures collected independently.

Conceptual challenges

There are many challenges to considering continuity of care. First, the definition of continuity of care varies. For example, our discussion is based on broader definition of continuity of care. This definition goes beyond personal contact and assumes integration of the health care system over time and place. Second, the characteristics of optimal continuity of care are interrelated. For example, consistency is a feature of effective communication and co-ordination. Similarly, communication is an essential for contact and contingency. Nevertheless, we believe each characteristic is sufficiently distinct and relevant to be considered. Third, because of the multi-faceted nature of continuity of care, we cannot be certain our list of characteristics is all-inclusive. We look forward to more discussion about continuity as health care systems aim for integration. Fourth, our case-based conceptual model may not be strictly generalizable to other health problems. For example, for a patient with a minor ankle sprain, continuity of care is relatively unimportant. For a patient with a skin laceration, some aspects of continuity are more relevant (e.g. patient collaboration with wound care, communication of tetanus immunisation status, and contingency in case of wound infection). For patients with various chronic complicated problems and circumstances, providers are most likely to recognise the importance of these the seven c’s, whether it be for the care of an HIV infected child in the tropics, a patient with tuberculosis from the inner city, or a pregnant woman from a remote community. We believe our case-based model provides a starting point for considering, measuring and improving continuity of care.

Conclusion

In summary, we have identified many potential breaks in continuity of care based on an illustrative case of a
Table 6. Charting the "seven c's" of continuity of care

| Characteristic | Features |
|----------------|----------|
| Contact        | Regular visits with providers |
|                | Outreach programs e.g. satellite clinics, tele-health |
| Collaboration  | Education of patients and care-givers in self-management skills |
|                | Patient decision-making |
| Communication  | Health information and care plans are accurate, clear, concise, and timely |
|                | Health information is available to providers as needed |
| Co-ordination  | Providers know who does what |
|                | Designated individual responsible for monitoring co-ordination of care |
| Contingency    | Provider availability for questions, change in status, and complications |
|                | Patient aware of potential problems and management required |
| Convenience    | Patient does not need to keep repeating the same information (system has memory) |
|                | Providers and system individualise management |
| Consistency    | Best practice from clinical practice guidelines |
|                | Flow charts, checklists, care plans, quality improvement, audit |

rural senior with multiple chronic medical problems needing transfer to a regional centre for acute care. We have catalogued these breaks in relation to the illness, the patient, the local provider, the regional centre and the health care system. To prevent breaks in continuity of care, we need to consider the seven c's characterising optimal continuity of care: contact, collaboration, communication, co-ordination, contingency, convenience and consistency. For optimal continuity of care, we need to not only foster patient-provider relationships but also improve delivery systems through management (guidelines, policy and standards; disease management; and integrated clinical pathways) and information (patient education, electronic health information; and telecommunications technology). More research is needed on how best to measure and improve continuity of care considering various perspectives, components, determinants, observational methods and integrative interventions.

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