

A mixed methods study of continuity of care from cardiac rehabilitation to primary care physicians

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BACKGROUND: Participation in cardiac rehabilitation (CR) programs results in multiple beneficial outcomes, including decreased morbidity and mortality. In Canada, the involvement of the primary care physician post-CR should increase the likelihood of sustaining the benefits achieved by CR and enhance the continuity of care that cardiac patients receive.

OBJECTIVES: To identify and describe information that is transferred from CR programs to primary care physicians in discharge summaries, and to assess the usefulness of such information from the perspective of the primary care physician.

METHODS: For each of 21 Ontario CR sites to which patients from a larger study were referred, up to four primary care physicians were contacted to request a copy of the CR discharge summary received and their participation in a telephone interview. Discharge data were coded and enumerated. Qualitative data from 17 interviews were transcribed and coded based on grounded analyses.

RESULTS: Of the 89 primary care physicians approached, 50 participated (response rate of 61.7%). Twenty-one physicians (42.0%) received the intended discharge summary from the CR site. There was great variability in clinical and service data reported, with 52.0% reporting an exercise prescription for the home or community and 42.0% reporting current medications prescribed. Four themes requiring improvement were generated from the physician interviews: patient behavioural management issues, health system factors, efficiency of data transfer and communication issues.

CONCLUSIONS: Major inconsistencies were noted between clinical data communicated versus what was desired. Data relating to attendance rates, behavioural management suggestions and lipid values were among the most notable omissions.

Key Words: *Cardiac care facilities; Cardiovascular disease rehabilitation; Continuity of care; Health services research; Physician's role in cardiovascular disease rehabilitation; Quality of health care*

Cardiovascular disease (CVD) is the leading cause of morbidity and mortality in the developed world (1). Moreover, the risk of mortality in patients who survive an acute coronary syndrome approaches 20% within the following two years (2). High rates of CVD morbidity and mortality necessitate continued secondary prevention efforts, such as cardiac rehabilitation (CR) participation and long-term follow-up care with a primary care physician. CR programs are designed to maintain and improve cardiovascular health by identifying and modifying cardiac risk factors. Participation in CR programs results in multiple beneficial outcomes (3-10). Most notably, CR has been shown to decrease all-cause and cardiac mortality by approximately 25% (11), with 50% of that reduction attributable to exercise therapy (12). In Canada, the involvement of the primary care physician post-CR should increase the likelihood of sustaining the benefits achieved by CR, and enhance the continuity of care that cardiac patients receive.

Une étude de la méthodologie discutable de la continuité des soins entre la réadaptation cardiaque et les médecins de premier recours

HISTORIQUE : Les programmes de participation à la réadaptation cardiaque (RC) ont de multiples effets bénéfiques, y compris une diminution de la morbidité et de la mortalité. Au Canada, la participation des médecins de premier recours après la RC devrait accroître la probabilité de maintenir les bienfaits obtenus par la RC et d'améliorer la continuité des soins que reçoivent les patients cardiaques.

OBJECTIFS : Déterminer et décrire l'information transférée des programmes de RC aux médecins de premier recours dans les sommaires de congé et évaluer l'utilité de l'information du point de vue du médecin de premier recours.

MÉTHODOLOGIE : Dans chacun des 21 établissements de RC en Ontario, vers lesquels les patients d'une étude plus vaste ont été aiguillés, on a communiqué avec jusqu'à quatre médecins de premier recours pour leur demander une copie du sommaire de congé de RC qu'ils avaient reçu et les faire participer à une entrevue téléphonique. Les données de congé étaient codées et énumérées. On a transcrit les données qualitatives de 17 entrevues et on les a codées selon des analyses probantes.

RÉSULTATS : Des 89 médecins de premier recours abordés, 50 ont participé (taux de réponse de 61,7 %). Vingt et un médecins (42,0 %) ont reçu le sommaire de congé prévu de l'établissement de RC. On a remarqué une importante variabilité des données cliniques et des services déclarés, 52,0 % faisant une prescription d'exercice à domicile ou dans la collectivité, et 42,0 % prescrivant des médicaments. Les entrevues avec les médecins ont permis de dégager quatre thèmes devant être améliorés : éléments liés à la prise en charge du comportement des patients, facteurs liés au système de santé, efficacité du transfert de données et problèmes de communication.

CONCLUSIONS : On a constaté d'importantes incohérences entre les données cliniques transmises et celles souhaitées. Les données portant sur les taux de participation, les suggestions de prise en charge du comportement et les valeurs lipidiques faisaient partie des omissions les plus remarquables.

Continuity of care is defined as the ongoing multidisciplinary management of a patient's health care over time (13). In a review of the literature, Haggerty et al (13) identified three types of continuity: informational, management and relational. Informational continuity refers to the use of information from previous events to make patient care appropriate, creating a link among health care providers. Management continuity refers to the provision of complementary services within a shared management plan. Relational continuity refers to the ongoing relationship between a patient and one or more health care providers, providing a link in care (13). Continuity of care has been shown to have beneficial effects on patient satisfaction (14,15), self-management and health outcomes (1,16). Continuity of care is also important for managing patient care among health care providers (17,18) and as such, continuity may enable ongoing CVD risk factor reduction.

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TABLE 1
Semistructured interview guide to explore primary care physician views on continuity of care in cardiac patients

1. How would you describe the continuity of care that cardiac patients receive, based on your relationship with cardiac rehabilitation programs? (probes: relational, informational, management).
2. What are some of the barriers to continuity of care between primary care physicians and cardiac rehabilitation programs? (emphasize cardiac rehabilitation programs).
3. What are some of the facilitators to continuity of care between primary care physicians and cardiac rehabilitation programs?
4. What type of information do you find most helpful to receive from cardiac rehabilitation centres concerning a patient's care/progress?
5. Of the following clinical data (as indicated on the discharge data inventory), I would like you to indicate whether you would find these values useful in your follow-up care of the patient.
6. With regard to your patient (insert patient name), what information did you receive from the cardiac rehabilitation centre? How did you use this information in your care of the patient? (probes: psychosocial issues – stress, depression, exercise adherence, medication, cholesterol levels, blood pressure, lifestyle factors [smoking, diet]).
7. If it were up to you, how would you improve the continuity of care of cardiac patients in your region?

Once CR programming is complete, medical responsibility in Canada is usually transferred to the primary care physician for ongoing cardiovascular risk reduction, with the cardiac patient sharing the responsibility of self-management. To facilitate appropriate continuity of care, a discharge summary containing pertinent information needs to be transferred from the CR program to the primary care physician. However, there is currently no understanding of which data are being transferred to primary care, nor is there knowledge regarding which data are desired by primary care physicians. Therefore, the objectives of the present research were to determine what information is being transferred between CR programs and primary care physicians in discharge summaries, and to determine the appropriateness and functionality of this information according to primary care physicians. Answering this two-part research question will provide insight regarding informational and management continuity for cardiac patients.

METHODS

The present research was approved by the ethics review boards of all participating institutions. In the first phase, quantitative approaches were employed using a descriptive, retrospective design. As part of a larger study (19), a baseline survey was completed in-hospital and the names of 661 consenting participants' primary care physicians were provided. In a mailed survey nine months later, the participants reported their participation (if any) in a CR program. Participation data were sorted according to the CR site, thus creating the sample of 21 Ontario CR sites. These CR sites were cross-referenced with the corresponding participants' primary care physicians. For each CR site, up to four primary care physicians were included in the sample of physicians from which to gain access to CR discharge summaries. This strategy was chosen based on the literature that indicates a low response rate among physicians (20,21). Four sites had numerous study participants attending their CR program, so four primary care physicians were randomly selected using SPSS version 13.0 (22). In the case of one CR site, all of the randomly selected primary care physicians declined participation, so an additional four physicians were randomly selected. Overall, 89 primary care physicians were contacted to request their participation in the study.

A modification of Dillman's method (23) was used to ensure an adequate response rate, so that at least one discharge summary per CR site was received. When physicians indicated that they had not received a discharge summary from the CR program, the CR site was contacted directly. The CR site confirmed the patient's self-reported

participation in the CR program. When a CR discharge summary was available, the document was obtained directly from the CR site.

To increase generalizability of the data, additional anonymous CR discharge summaries were requested directly from CR sites that were not the targets of referral in the larger study. A list of 53 CR sites was generated from the online Canadian Cardiac Rehabilitation Foundation database (<www.cardiacrehabilitation.ca/rehab_centres.php>). A standardized letter was sent to all CR sites, both within and outside Ontario, using a modification of Dillman's method (23).

Corresponding discharge information provided by the CR sites was enumerated using the discharge data inventory (DDI) – a variant on a validated referral data inventory tool (24) created and piloted for the purposes of the present study. The DDI enables quantification of the information that was provided by the CR site to the primary care physician who is assuming care of the cardiac patient. Data relating to informational continuity (eg, length of hospitalization, date of the last procedure or event, and current medications), management continuity (eg, follow-up care plan, risk factor education and psychosocial assessment) and relational continuity (eg, contact information for CR providers that participated in the patient's care) were enumerated using the DDI based on its presence (yes=1) or absence (no=0) in the CR discharge summary. A descriptive examination of the data was performed using SPSS version 13.0 (22).

Qualitative methods

Qualitative methods were used to address the second research question regarding primary care physicians' perceptions of care data received. Telephone interviews were conducted by the first author with 17 consenting primary care physicians providing care to participants who attended CR. Demographic data were collected before the interview to describe the sample. A semistructured interview guide was used to gather in-depth opinions regarding CR information received and preferred (Table 1). These interviews probed for gaps in the continuity of care of cardiac patients, and ascertained usage of CR discharge summary data in ongoing patient care.

The data collected during the semistructured interviews with physicians were audiotaped, transcribed verbatim (except to preserve anonymity) and imported into QSR N6 software (25). This software was used to facilitate coding and analysis of the interviews, searching and retrieving of related segments and subthemes, and theorizing. Data transcription and analysis were concurrent with data collection, and involved inductively documenting emerging themes. Themes were coded and analyzed based on grounded analyses (26-28). Grounded analysis involves three coding methods: open, axial and selective coding. Open coding is concerned with identifying, naming, categorizing and describing phenomena found in the text. Axial coding is the process of relating codes, such as categories and properties, to each other through a combination of inductive and deductive thinking. Selective coding is the process of choosing one category to be the core category, and relating all other categories to that category (29).

The number of primary care physician participants interviewed was dependent on the attainment of saturation of themes, which was ascertained by two independent coders simultaneously. When all interviews were complete, two investigators independently reindexed the data by code. To ensure the transparency and validity of the results, an audit trail was used, incorporating the technique of overall checks of the representativeness of the coding and categories.

RESULTS

Participants

Of the 89 primary care physicians who were approached to participate, 50 participated, 31 declined participation and eight were deemed ineligible, resulting in a response rate of 61.7%. The reasons for ineligibility included an inability to identify or locate the primary care physician, or the participant did not attend CR. Information regarding sex of the primary care physician, graduation year and location of the medical school was retrieved from the online version of the Canadian Medical Dictionary

TABLE 2
Descriptive characteristics of primary care physicians
(n=81)

Characteristic	Participants		Non-responders (n=31)	χ^2
	Total (n=50)	Interviewed (n=17)		
Sex, n (%)				0.86
Male	39 (78.0)	14 (82.4)	26 (83.9)	
Female	11 (22.0)	3 (17.6)	5 (16.1)	
Location of medical school, n (%)				0.6
Ontario	34 (68.0)	13 (76.4)	20 (64.5)	
Canada (not Ontario)	6 (12.0)	2 (11.8)	5 (16.1)	
Foreign	10 (20.0)	2 (11.8)	5 (16.1)	
Missing			1 (3.2)	
Year of graduation from medical school, mean \pm SD	1979.5 \pm 10.9	1979.7 \pm 10.5	1979.0 \pm 8.0	0.93
Patient volume/week, mean \pm SD	N/A	143.75 \pm 50.23	N/A	

Note that all $P > 0.05$. N/A Not applicable

<www.mdselect.com>. Additional information regarding practice volume was collected during the telephone interviews. Characteristics of the participants and refusers are presented in Table 2. There were no significant differences in physician characteristics based on participant status ($P > 0.05$).

Content of discharge summaries

Twenty-one (42.0%) primary care physicians received the intended discharge summary from the CR site. Six (12.0%) indicated that they had received the CR discharge summary. However, on verification of these documents, it was determined that they did not originate from a CR program. Most of these documents were hospital discharge summaries that were generated following acute care admission due to CVD that preceded CR participation. Twenty (40.0%) physicians had patients who were verified to participate in CR, yet they reported that they did not receive a summary. For these primary care physicians, direct contact was made with the CR site, and the CR discharge summary was obtained. In many of these cases, the CR discharge summary had been sent to the cardiac specialist who made the CR referral, possibly due to concerns regarding patient confidentiality and privacy legislation. The remaining three (6.0%) primary care physicians reported that they did not receive a CR discharge summary. The existence of a CR discharge summary was unverifiable due to an inability to make contact with the corresponding CR program. As a result, 19 discharge summaries were obtained, which corresponded to 21 CR sites. Of the additional 53 CR sites that were contacted both within and outside of Ontario, 31 participated in the study (64.6% participation rate) and 17 declined participation. Five CR sites (9.4% of CR sites contacted) were deemed to be ineligible due to their lack of use of a CR discharge summary, because patients in those programs do not terminate participation in CR after a predetermined length of time, and therefore are not discharged.

Using these two retrieval sources, a total of 50 discharge summaries were enumerated using the DDI. The results are presented in Table 3. Forty-four (88.0%) discharge summaries were standardized forms, and six (12.0%) were dictated notes that followed a fixed format.

Qualitative themes

Table 2 provides descriptive characteristics of interview participants. Coding of the interview transcripts led to the identification of four major themes, representing the most significant issues that arose during the interviews, including patient behavioural management issues, health system factors, the efficiency of data transfer and communication issues.

TABLE 3
Descriptive summary of data included in cardiac
rehabilitation (CR) discharge summaries (n=50)

Type of continuity	Description of item	Frequency, n (%)
Relational	CR contact information	37 (74.0)
	CR contact personnel	46 (92.0)
Informational	Exercise capacity at intake (METs)	20 (40.0)
	Exercise capacity at discharge (METs)	26 (52.0)
	TC:HDL ratio at intake	20 (40.0)
	TC:HDL ratio at discharge	24 (48.0)
	Blood glucose	30 (60.0)
	Resting blood pressure at intake	24 (48.0)
	Resting blood pressure at discharge	33 (66.0)
	Target heart rate at intake	12 (24.0)
	Target heart rate at discharge	21 (42.0)
	Body mass index (or weight) at intake	28 (56.0)
	Body mass index (or weight) at discharge	37 (74.0)
	Waist circumference at intake	25 (50.0)
	Waist circumference at discharge	29 (58.0)
Management	Symptoms on exertion	22 (44.0)
	Length of CR program	35 (70.0)
	Exercise training received during CR	12 (24.0)
	Medications	21 (42.0)
	Estimated percentage of CR attendance	13 (26.0)
	Written comments regarding comorbidities	7 (14.0)
	Family history	7 (14.0)
	Exercise prescription for home or community	26 (52.0)
	Personal rehabilitation plan	13 (26.0)
	Nutrition counseling received	20 (40.0)
	Smoking cessation counselling	25 (50.0)
Vocational counselling	3 (6.0)	
Psychosocial assessment/counselling	17 (34.0)	

HDL High-density lipoprotein; METs Metabolic equivalents; TC Total cholesterol

Theme 1 – behavioural management issues: This theme included specific information about the patient's current health status and recommendations for the maintenance of his or her ongoing cardiac care. The primary care physicians expressed a need for information regarding their patient's current state of health, their level of participation in the CR program, directions on how to promote continued health behaviour modification and recommendations for the patient to continue modification of risk factors.

02: Well, I mean, it would make it easier if people had standardized forms...and if you could expect a progress report after a couple of months to say...that yes, a patient is attending or not, and...they're improving to this point or not, or whatever. You know that would certainly make it a lot easier too.

09: Exercise is important; sort of what their tolerance was at the beginning and at the end. If there's any restrictions to their ongoing activities. If there's certain things that they should or should not be doing. I often find it helpful when, especially patients after an acute event, if they have a specific timeline when certain activities are permitted.

12: Well, I guess, some measure of their exercise tolerance [would be helpful]...I would assume they keep a record of their blood pressure and pulse during exercise, that would be important. But just simply their attendance and their receptiveness to the information because I think CR, in my mind, includes such things as lifestyle and dietary changes.

Theme 2 – health system factors: This theme included references to discrepancies in the continuity of cardiac care received by patients.

TABLE 4
Proposed minimum dataset to include in cardiac rehabilitation (CR) discharge summaries

Description of item
CR contact information
CR contact personnel
Exercise capacity at intake and discharge (METs)
Lipid values at intake and discharge
Stress test measures at intake and discharge
Body mass index and waist circumference at intake and discharge
Symptoms on exertion
Exercise training received during CR
Medications (name, dosage and frequency)
Estimated percentage of CR attendance
Exercise prescription for home or community
Personal rehabilitation plan (flag areas in which guideline targets are not met)
Nutrition counseling
Smoking cessation counselling
Vocational counselling
Psychosocial assessment/counselling
<i>METs Metabolic equivalents</i>

Primary care physicians indicated that cardiac care is highly variable among their patients. Another major component of this theme was the duplication of tests received by CR participants.

01: Continuity of care...it seems to be a little bit...fragmented. Some patients seem to get into one stream, some patients get into another stream and I haven't been able to figure out how they do that...So, some patients get very good continuity and some patients don't seem to get any at all.

05: The problem is communication and duplication of services. They don't know if I do lipid tests. And if they do it, and they don't send it to me, I don't know if it's done. I don't know what happens.

10: We don't find [the cholesterol levels of the patient] that useful if we're tracking it, but it becomes an issue if they're tracking it too because then it becomes confusing as to who is doing it. So, it needs to be clear, if [the CR program is] going to do it, how often they're going to follow-up and what their targets are from the outset. Because then there's an overlap and duplication of care.

Theme 3 – efficiency of data transfer: This theme incorporated the mechanisms that support the effective exchange of CR discharge data in a time-sensitive manner. The use of electronic medical records – a means for increasing the efficiency of data transfer – was also discussed by numerous primary care physicians.

03: ...Obviously it all comes down to the discharge summary...I think that's crucial, that people have to get a discharge summary in a timely fashion.

05: I think making sure that everybody's on side in terms of communication, implementing the electronic medical record, sharing the information across the circle of care, so you have to take care of privacy issues.

09: I guess some of the barriers are just in the events when the notes are not forthcoming in a timely manner. Sometimes timing isn't as good.

11: Well, it would be assistive if there was a sort of a regional identifier. So that wherever the patient went, everybody would know who that was. And then, certain types of information, like who their family doctor was, would follow with them. And so then it wouldn't have to be recaptured at every different facility at ever different time.

Theme 4 – communication issues: Many primary care physicians expressed a desire for improved communication between CR programs and primary care physicians. Coordination between physicians and the quality of the CR discharge summary were identified as key factors in improving the communication issues regarding the continuity of care for cardiac patients.

11: ...Sometimes the family doctor is not identified. So you have to identify them if you want to keep them involved [in the care of the cardiac patient]. And there tends not to be a lot of direct contact between [the CR program and the primary care physician], so sometimes it can be a bit frustrating.

03: But the problem is because patients' medicines change... they go to different doctors, and the medications get changed... So, you know, it would be very useful to have a timely update.

16: I suppose a lot of people may be referred by cardiologists and the communication goes back to the cardiologist as opposed to the family physician. That's occurred on some occasions.

The combined quantitative and qualitative data analyses presented some pertinent information regarding the continuity of care between CR programs and primary care physicians. Based on this research, a minimum dataset that CR programs should include in discharge summaries is proposed in Table 4.

DISCUSSION

Primary care physicians reported that CR discharge data are useful for facilitating patient care. For example, current health status information, such as exercise capacity and blood pressure (informational continuity), CR contact details (relational continuity) and recommendations for ongoing risk factor modification (management continuity) are all relevant to the ongoing follow-up care of the patient. However, primary care physicians perceive information from CR programs to diverge significantly from desired information. Only approximately 40% of primary care physicians received the CR discharge summary that was intended for them. Often, as verified by the CR programs, the discharge summary was sent to the cardiologist who made the CR referral, while the primary care physician was also interested in receiving it. Although the CR discharge data may be useful for the cardiologist, informing all of the physicians involved with the patient would optimize the continuity of care that cardiac patients receive. The discharge summary may have been sent only to the referring cardiologist rather than the primary care physician because of concerns related to confidentiality and privacy legislation. These findings highlight the importance of obtaining informed patient consent at the start of the CR program to disseminate CR discharge data to all providers involved in the patient's cardiac care. This would better promote continuity of care among health care providers.

Furthermore, CR discharge summaries do not consistently report clinical data that are deemed to be relevant by primary care physicians for the follow-up care of patients. The majority of the discharge summaries analyzed in the present study included some, but not all, pertinent information such as CR contact personnel, the length of the CR program and an exercise prescription for the home or community. However, many items that are deemed relevant by the primary care physician are not consistently included in the CR discharge summaries. For example, physicians expressed a need for CR attendance data, yet less than 25.0% received this information in the discharge summary. Similarly, physicians requested individually tailored behaviour change information, yet only 24.0% received information regarding the CR participant's personal rehabilitation plan. Primary care physicians also expressed a need for a list of the patient's current medications; only 42.0% of discharge summaries included this information. Moreover, not all discharge summaries provided explicit contact information (74.0%) if the physician had any questions. Clearly, information regarding CR services and patient status is being inadequately conveyed to the primary care physician. As illustrated by the qualitative

data, primary care physicians' perceptions of important information should be incorporated into standardized CR discharge summaries.

The results of the present study show that primary care physicians expressed a desire for brief and prompt discharge information. Similarly, van Walraven and Rokosh (30) found that as time from patient discharge exceeded four weeks, the physician perception of the discharge summary quality decreased. More recently, Rao et al (31) found that a prescribed template increased the quality and decreased the length of discharge summaries. This illustrates the need for CR programs to work toward concise, prompt and relevant CR discharge summaries. In the current sample, brevity was one area of strength (all of the discharge summaries were one to two pages in length, indicating that the CR programs are providing CR discharge data in a concise, user-friendly manner), which is consistent with other studies on discharge summary quality (30). This is an accomplishment that should be sustained by CR programs.

Furthermore, improved efforts that facilitate the information continuum, such as standardized discharge summaries that are administered electronically, could foster greater cardiovascular disease management. The use of regional identifiers was mentioned by several primary care physicians as a mechanism for improving continuity of care. Electronic medical records and regional identifiers may benefit the health care system, care providers and patients; therefore, further research in this area is warranted. These data support the physicians' desires for regionalization of health information, and in conjunction with attention to privacy and security issues, some jurisdictions are now successfully implementing such systems.

When interpreting the current findings, it is important to note that 41% of study participants enrolled in CR. This CR participation rate is relatively high compared with analyses from a similar population (32) that demonstrated a 30% CR referral rate and a 21.5% CR participation rate, possibly resulting from the automatic referral mechanisms used by one of the hospitals in which one-half of the patients were recruited. Due to low enrolment in CR, the majority of cardiac patients may be experiencing care that is even more fragmented than was the case for these CR participants, because CR participation has been shown to positively influence disease progression and health-related quality of life (33).

Limitations

The present study has several limitations. The study design was subject to several possible biases, including selection bias and reporting

bias. However, we randomly selected the primary care physicians from each CR site from a large pool of 661 patients who had attended three hospitals, thus decreasing the selection bias in our sample. Although the sample of primary care physicians was relatively diverse, the representativeness of this sample cannot be firmly established. According to the Canadian Medical Association master files available online <www.cma.ca/index.cfm/ci_id/16959/la_id/1.htm#1>, there were no significant differences in sex between the study sample and national data ($P=0.97$) (data not shown). Overall, the relative homogeneity of physician samples has been established (20,21), lending credence to the generalizability of the findings to the Canadian health care system.

CONCLUSION

Because the present research identified areas of improvement regarding the flow of information between CR programs and primary care physicians, future research should be directed toward the feasibility and implementation of standardized CR discharge summaries. By increasing CR discharge summary quality and consistency, continuity of cardiac care may be improved. Principally, mechanisms need to be explored to increase the dissemination of CR discharge data to primary care physicians. These discharge summaries should include information identified as pertinent by the primary care physician, such as CR attendance data, long-term behavioural modification recommendations, and medication information to ensure appropriate long-term follow-up and maintenance of cardiovascular risk reduction. If included, this information could improve the continuity of care that cardiac patients receive. Greater informational continuity could decrease the duplication of services, potentially increasing the efficiency of the health care system. Greater continuity may ultimately improve cardiac patient health outcomes, satisfaction and adherence.

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