Primary Care Provider Receipt of Cardiac Rehabilitation Discharge Summaries
Are They Getting What They Want to Promote Long-Term Risk Reduction?

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Background—Communication between cardiac rehabilitation (CR) and primary care providers (PCPs) is paramount to promoting long-term risk reduction after the completion of CR. The objectives of this study were to investigate receipt of CR discharge summaries by PCPs, as well as timing, and satisfaction with and perceptions of CR summaries.

Methods and Results—Five hundred seventy-seven eligible PCPs of consenting enrollees from 8 regional or urban Ontario CR programs were invited to participate in this cross-sectional study. Discharge summaries were tracked from the CR program to the PCP’s office. PCPs who received a summary were mailed a survey assessing their perceptions of the summaries. Of the 138 (24.0%) eligible consenting PCPs, 71 (51.5%) received CR discharge summary, of whom 64 (90.1%) completed the survey. All PCPs desired to receive discharge summaries, with most wanting it transmitted via fax (n=38, 61.3%). Forty-seven (77.1%) PCPs reported they had or would use information in the summary for patient care. PCPs who did not receive the discharge summary in advance of their patient’s first post-CR visit (n=7, 10.9%) were significantly less likely to use it in patient care (P<0.01). On a 5-point Likert scale, PCPs rated medication (4.65±0.74), patient care plan (4.43±0.87), and clinical status (4.33±0.94) as most important to include in a CR discharge summary. These were not provided in 18.8% (n=12), 4.7% (n=3), and 22.2% (n=14) of summaries, respectively.

Conclusions—Approximately half of CR discharge summaries reach PCPs, revealing a large gap in continuity of patient care. (Circ Cardiovasc Qual Outcomes. 2013;6:83-89.)

Key Words: cardiovascular diseases • continuity of care • interdisciplinary communication • primary care • rehabilitation

Cardiovascular disease is the leading cause of mortality and morbidity in the world.1 As a result of successful advanced interventional procedures, many cardiac patients survive their cardiac event and live chronically with cardiovascular disease. This must be managed optimally to mitigate the high risk of recurrent events. Cardiac rehabilitation (CR) is an outpatient chronic disease management program that offers structured exercise, exercise testing, medical assessment, client and family education, comprehensive risk factor identification, and behavior modification that effectively manage these risks.2-5

Although the typical 3- to 6-month6,7 CR program model has been demonstrated to be efficacious in reducing morbidity and mortality, evidence suggests that cardiovascular disease patients may require additional support after CR to sustain and manage cardiac risk reduction.8 Indeed, communication among healthcare providers is recognized as a key factor to effective patient care coordination and optimal continuity of care.9,10 CR discharge summaries enable coordination of patient care among practitioners and provide the primary care provider (PCP) with information on the principal diagnosis, medication list, test results, and patient care plan.11 CR discharge summaries are also used by CR programs to communicate important patient information to the PCP on completion of the CR program. A typical CR discharge summary contains information on exercise tolerance, compares CR intake and discharge risk factors, and identifies areas for long-term risk factor management for the PCP to use in patient care.2,12 In fact, CR performance measures in Canada13 and the United States14 include CR communication to PCPs, and the most recent British core components15 recommendations endorse the use of such communication practices.

Unfortunately, however, the transmission of CR discharge summaries to PCPs has been demonstrated to be low. Riley...
WHAT IS KNOWN

- Interprovider communication is necessary to ensure care quality and safety.
- Cardiovascular disease requires comprehensive and continual management; primary care follow-up is needed after achievement of risk reduction in cardiac rehabilitation.
- Similar to hospital discharge summaries, primary care providers often do not receive cardiac rehabilitation summaries.

WHAT THE STUDY ADDS

- Through this first prospective study, it was confirmed that only half of cardiac rehabilitation discharge summaries are received by primary care physicians, despite a universal desire to receive them.
- Physicians are more likely to use the information in patient care, particularly information on medication, care plan, and clinical status, if they receive it before their patient’s first postdischarge visit.

et al.16 conducted a mixed-methods retrospective study that tracked the transmission of CR discharge summaries. Their results showed that although PCPs perceived discharge information as useful for facilitating patient care, only 42% received a summary. Moreover, PCPs reported qualitatively that the information received from CR programs was not consistent and, in many cases, diverged considerably from the information they deemed useful and pertinent. Prospective, quantitative study examining the transmission of discharge summaries across the CR–PCP interface is lacking. The objectives of this study were to examine overall receipt of CR discharge summaries by PCPs, that is, whether they were received in time for the patient’s first post-CR visit and were used in patient care; PCP satisfaction with and perceptions of CR discharge summaries; and the usefulness of specific information provided in CR discharge summaries.

Methods

Design and Procedure

This study was observational and cross-sectional in design. Ethics approval was obtained from all participating institutions. The results herein follow from a cohort study analyzing CR intake summary transmission13 and present CR discharge summary transition results based on prespecified objectives.

In Ontario, CR services are supported through the provincial government. On average, patients undergo supervised exercise 1 to 2 times per week for a median of 5 months.4 Each of the 8 CR sites was chosen to represent a diversity of CR programs from large academic to small community sites. Sites were asked to describe their CR discharge processes. Discharge summaries were created by each CR program individually at various time points before study inception as part of their program development. Usual practice was observed in this study.

Recruitment occurred between September 2008 and March 2011. Consecutive enrollees from each participating CR site were approached to solicit consent at their intake appointment by a staff member involved in the patient’s care. Consenting participants were asked to provide the name of their PCP, which could be a family physician or nurse-practitioner. Participant (patient) accrual was ended when the patients’ PCPs were no longer unique. In other words, accrual was ended when patients consented to participating in the study, but their PCP had already been approached to participate in this study. Once the frequency of repeat PCPs increased, it was determined that the pool of unique PCPs was saturated, and accrual at that CR site was ended.

The PCP’s contact information and characteristics were extracted from the College of Physicians and Surgeons of Ontario directory (http://www.cpso.on.ca/docsearch/) or the College of Nurses of Ontario directory (http://www.cno.org), which are publically accessible online databases. This information was used to mail the PCP an information letter and consent form. After consenting to participate, PCPs were asked to rate their satisfaction with previously received CR discharge summaries on a 5-point Likert scale.

When the PCP provided consent, the research assistant tracked the patient’s estimated CR discharge date and confirmed with each site when a patient had graduated. A form to verify receipt of the CR discharge summaries was mailed to PCP offices 1 month later. Administrative assistants were asked to check whether the CR discharge summary was in the patient’s file. A modified version of the Dillman Tailored Design Method15 to optimize response rate was applied as follows: replacement fax to nonresponders 1 week later and telephone call to nonresponders 2 weeks thereafter.

For those CR discharge summaries that were confirmed as sent by CR but not received by the PCP, CR sites were contacted and asked to verify the contact information on the hard-copy discharge summary and to whom it was sent (ie, PCP or cardiac specialist).

If the CR discharge summary was confirmed as received, a survey was mailed to these PCPs to investigate their perceptions of the content. The same approach of repeated contacts to nonresponders as outlined above was applied. To minimize bias, another member of the laboratory who was blinded to study objective and CR site entered the verification and survey data.

Participants

PCPs were included in the study if their patient completed the CR program. PCPs were excluded from participating in the study if they had already been approached; this prevented duplicate PCP responses. Thus, each PCP provided their perceptions for only 1 CR discharge summary.

Measures

To describe the physician sample, the PCP’s sex, year of graduation, and location of medical school were extracted from the College of Physicians and Surgeons of Ontario directory. In addition, after consenting, PCPs were asked to rate their satisfaction with previous CR transition records received on a 5-point Likert scale (1=very unsatisfied, 5=extremely satisfied). The main outcome variable, receipt of a CR discharge summary, was recorded as yes or no by the PCP’s administrative staff. If CR discharge summary receipt was not verified as received or not received, it was recorded as missing data, and the PCP was not invited to complete a survey.

The investigator-generated PCP survey (Appendix A in the online-only Data Supplement) was developed on the basis of the available literature,16 as well as input from the investigative team and participating CR programs. The survey primarily comprised closed-ended (eg, yes/no, or 5-point Likert-type scale) questions that investigated summary transmission (timeliness, transmission mode preference), the usefulness of data elements, and perceptions (eg, satisfaction, use of the summary). Some questions included an additional open-ended response option for further description.

Analyses

All analyses were performed with SPSS version 19. A descriptive examination of CR site discharge summary practices was performed. PCP characteristics were compared on the basis of participation status with the use of 1-way ANOVA and χ2 as appropriate, with post hoc tests of least significant difference when the former was significant.
To assess the first objective, the rate of discharge summaries received was calculated by dividing the number received (numerator) by the number of PCPs who confirmed CR discharge summary transition (denominator). The rate received was also calculated by counting only discharge summaries confirmed as sent by the CR program as the denominator. A descriptive examination was performed to describe timeliness and use of summaries. To assess the second objective, a descriptive examination was again performed.

Results

CR Program Practice

CR program practices in the transmission of CR discharge summaries are shown in Table 1. All 8 CR sites reported that they identified the patient’s PCP and sent discharge summaries to the PCP if the patient had one. When asked if their site had a maintenance program, 3 (37.5%) indicated affirmatively. Of these, 2 (66.7%) indicated that they sent discharge summaries at the end of CR if the patient was enrolling in the maintenance program. Table 2 lists the recommended elements to be included in CR discharge communication based on Canadian2,13 and American3,14 guidelines and displays the elements provided by each of the CR sites.

Respondent Characteristics

A study flow diagram illustrating the accrual of CR patients and their corresponding PCPs is shown in the Figure. Of the 806 CR enrollees who consented to participate, 593 (74.8%) were men, and their mean±SD age was 61.8±11.4 years. Participants’ cardiac history is reported elsewhere,17 but patients had primarily been referred after myocardial infarction and percutaneous coronary intervention.

One hundred thirty-eight of the 576 (24.0%) eligible PCPs consented to participate. Consenting PCPs included 2 (1.5%) nurse-practitioners, whereas all others were family physicians. As displayed in Table 3, participating PCPs were significantly more likely to be women and to have graduated from medical school more recently than declining PCPs.

Characteristics of PCPs who received a CR discharge summary and completed the survey versus those who did not are also shown in Table 3. There were no significant differences in measured variables between these PCPs. Overall, PCPs were moderately satisfied with the CR discharge summaries that they had received in the past. Among those PCPs who completed the survey, the median number of patients they reported seeing per week was 115, and 26 (41.9%) PCPs worked within a family health team.

PCP Desire for and Receipt of CR Discharge Summaries

Of the 64 PCPs who received a summary and completed the survey, all (100%) desired a CR discharge summary. Thirty-eight (61.3%) PCPs preferred to receive discharge summaries by fax, 16 (25.8%) by mail, and 8 (12.9%) by electronic transmission.

The rate of CR discharge summary receipt is shown in the Figure. Of the 138 discharged patients with consenting PCPs, summaries were not generated by the CR program for 18 (13.0%) patients. Thus, rates of receipt overall and of those sent are displayed. Given the high proportion of discharge summaries confirmed as being sent by CR but not received by the PCP (ie, 120–71=49 [40.8%]), a post hoc investigation was performed. Three proximate CR sites were visited, representing 29 (59.2%) discharge summaries that were unaccounted for, to ascertain why. Seven (24.1%) CR discharge summaries were addressed to a cardiac specialist and not the PCP, and 22 (75.9%) were verified as having the correct PCP information but still did not reach the PCP for unknown reasons.

Timeliness and Use of Summary Content for Patient Care

Of the 64 PCPs who received CR discharge summaries, when asked whether they received it in time for their patient’s first post-CR visit, 57 (89.1%) responded affirmatively. PCPs who did not receive the CR discharge summary in time (n=7, 10.9%) were significantly less likely to use it in patient care than those who did (P<0.01). When asked whether they used the information found in the CR discharge summary for patient care, 47 (77.1%) PCPs reported they had or would be using it during an upcoming visit. Finally, when asked to rate their use of 3 main elements of the summary to manage their patients (5-point Likert scale), PCPs most
strongly agreed that they used information about exercise (3.48±0.98), followed by medication (3.41±0.97), and then weight (3.12±1.00).

Table 2. Content of Cardiac Rehabilitation Discharge Summaries Compared With Guideline Recommendations

<table>
<thead>
<tr>
<th>CR Site</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>F</th>
<th>G</th>
<th>H</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clinical status or risk score</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>X</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Medication information</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>X</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Exercise capacity</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Stress test results</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Exercise prescription</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>X</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Blood pressure control</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>X</td>
</tr>
<tr>
<td>Lipid control</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Anthropometric data</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>X</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Diabetes mellitus control</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Smoking cessation</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Nutrition/weight management</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Psychological status</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
</tbody>
</table>

CR indicates cardiac rehabilitation. Recommended elements in this table are based on the 2009 Canadian Guidelines for Cardiac Rehabilitation and Cardiovascular Disease Prevention and were compared with sample discharge summaries that CR sites provided to us at the time of this study.

PCP Perceptions of CR Discharge Summaries Received

Of the 64 PCPs who received CR discharge summaries, their mean overall satisfaction with discharge summaries received was 4.01±1.40 out of 5 on a Likert scale and ranged from 3.00±1.89 to 5.0±0.0 across sites (P=0.45). PCPs’ ratings of satisfaction (3.51±1.20) with discharge summaries received previous to the study were not significantly related to PCPs’ satisfaction with the CR summary under study (P=0.70). PCP perceptions of discharge summaries received for their patients are presented in Table 4.

Table 5 lists key elements included in discharge summaries and PCP report of whether they were provided in the summary received. When provided, PCPs’ ratings of the perceived usefulness of these data elements are also shown.

Discussion

Clinical practice guidelines for CR promote communication of patient’s medical condition at program entry and exit. Indeed, this communication is deemed an indicator of CR program quality in Canadian, American, and British guidelines. This is based on evidence demonstrating that communication to primary care can result in improved risk factor control among patients. To the best of our knowledge, this is the second study to investigate CR discharge summary transmission to primary care and the first study to quantitatively assess PCP perceptions of CR discharge summary content and usefulness of specific data elements. Despite being desired by all PCPs, only half of CR discharge summaries were received, which is consistent with the Riley et al finding of 42% receipt. When received, however, most were received in time for the patient’s first post-CR visit, were used in patient care, and were highly satisfactory.

Examine health information transmission more broadly, the results of the present study are congruent with prior research that has examined discharge communication to primary care after hospitalization. Across the hospital–PCP transition, deficits in discharge communication are substantial, ranging from 12% to 24% receipt, which is poorer than the 52% that we found across the CR–PCP transition. Moreover, reasons cited for low discharge summary receipt are consistent with our findings and include the summary not being sent to the PCP, failure to produce a discharge summary at all, and despite being sent to the PCP, receipt failure.

The potential impacts of this missing clinical information during primary care visits are numerous. For example, Moore et al found that 50% of women no longer exercised 3 months after CR. Willich et al found that blood pressure, body mass index, cholesterol, low-density lipids, and triglycerides worsened in the first 3 months after CR. However, interventions targeted at improving cardiac risk factors after CR have been successful. Sniehotta et al showed that patients who participated in a planning group and kept a diary had significantly higher exercise adherence 4 months after CR. Furthermore, by targeting interprovider communication, Meis et al showed that letters sent from the CR program medical director to the PCP detailing their patient’s lipid goals and therapeutic options resulted in significantly higher attainment of target lipid levels. Additionally, other studies have shown that lipids and blood pressure can be significantly lowered after CR by sending a
remind the patient every 3 months informing them to see their PCP or by sending a letter every 6 months after CR from the cardiac specialist to the PCP about risk factor targets.

**CR Discharge Summary Transmission**

Besides the low rate of receipt, 4 other findings related to transmission were particularly concerning. First, although patients were considered to have completed their CR program, CR programs reported that many patients do not complete their postprogram assessments. For example, program graduates are often asked to provide a blood sample, to reassess anthropometrics, to undergo an exit stress test, and to complete psychometrically validated surveys on nutrition and smoking habits, as well as quality of life, for example. When no exit data are available, some CR sites do not generate a summary, given that a complete update on a patient’s health status since the intake summary would not be available to summarize and share. This problem should not be underestimated because the gains patients achieve would then not be documented, any underoptimized elements of risk reduction would not be known, and PCPs and patients would have no continuous care plan to promote continued risk reduction.

Second, there was significant variation in transmission rate by CR program. This suggests that there is a lack of standardized transmission practice across CR sites. Third, the problem of nonidentification of the PCP also hampered CR summary transmission. This is consistent with previous findings in the CR field, and more broadly. With the growing implementation of systematic inpatient referral strategies, more CR referrals are being received from attending specialty physicians who will likely not see the patient in follow-up, decreasing the need for generating a CR discharge summary for these referring specialty physicians. Clearly, PCPs need to be identified on the CR referral and subsequent CR discharge summaries.

Finally, despite post hoc investigation, it is unknown why ≈25% of discharge summaries never reached the PCP. Some potential explanations are offered below. First, some CR sites have a maintenance program, and CR staff may have incorrectly reported sending a summary when patients transitioned to this phase of care. Second, the PCPs may not be archiving to this phase of care. Second, the PCPs may not be archiving the CR discharge summary in their medical record. And third, administrative staff may have failed to locate the discharge summary.

**CR Discharge Summary Content**

Overall, PCPs were very satisfied with CR discharge summaries received, regardless of site. With regard to the format and usefulness of the CR discharge summary, PCPs were highly satisfied with the length, comprehensibility, organization, reading time required, and overall quality. PCPs found

### Table 3. Descriptive Characteristics of PCPs by Participation Status

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Completed Survey (n=64)</th>
<th>Did Not Complete Survey (n=74)</th>
<th>P</th>
<th>Nonparticipants, n (%)</th>
<th>Declined (n=438)</th>
<th>P†</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sex, male</td>
<td>38 (59.4)</td>
<td>43 (58.2)</td>
<td>0.88</td>
<td>311 (71.0)</td>
<td>&lt;0.01</td>
<td></td>
</tr>
<tr>
<td>Location of medical school</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ontario</td>
<td>49 (76.6)</td>
<td>55 (74.3)</td>
<td>0.60</td>
<td>291 (66.4)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Canada, non-Ontario</td>
<td>8 (12.5)</td>
<td>7 (9.6)</td>
<td></td>
<td>48 (11.0)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Outside Canada</td>
<td>7 (10.9)</td>
<td>12 (16.2)</td>
<td></td>
<td>99 (22.6)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Year of graduation from medical school (mean±SD)</td>
<td>1985±10.85</td>
<td>1985±10.20</td>
<td>0.69</td>
<td>1982±11.08</td>
<td>&lt;0.01</td>
<td></td>
</tr>
<tr>
<td>Satisfaction with previously received CR summaries‡ (mean±SD)</td>
<td>3.75±1.20</td>
<td>3.32±1.19</td>
<td>0.06</td>
<td>...</td>
<td>...</td>
<td></td>
</tr>
</tbody>
</table>

CR indicates cardiac rehabilitation; and PCP, primary care provider. Two PCPs were nurse-practitioners. The majority of ineligible PCPs were ineligible because of duplication; therefore, their characteristics are not shown. Student t and χ² tests were used to compare groups.

†Compares participants with nonparticipants.
‡Scores range from 1 to 5, with higher scores denoting greater satisfaction. PCP satisfaction with previously received CR summaries was obtained immediately after consent.

### Table 4. Primary Care Physician Perceptions of Cardiac Rehabilitation Discharge Summaries (n=64)

<table>
<thead>
<tr>
<th>Rating (mean±SD)</th>
<th>Participants, n (%)</th>
<th>Nonparticipants, n (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>I was satisfied with the length of the discharge summary</td>
<td>4.07±0.71</td>
<td></td>
</tr>
<tr>
<td>The discharge summary was easy to understand</td>
<td>4.00±0.76</td>
<td></td>
</tr>
<tr>
<td>I used information in the discharge summary to manage my patient’s risk factors</td>
<td>3.90±0.81</td>
<td></td>
</tr>
<tr>
<td>The discharge summary was of high quality</td>
<td>3.89±0.78</td>
<td></td>
</tr>
<tr>
<td>I was satisfied with the length of time required to read the discharge summary</td>
<td>3.83±0.96</td>
<td></td>
</tr>
<tr>
<td>I was satisfied with the organization of the discharge summary</td>
<td>3.80±0.95</td>
<td></td>
</tr>
<tr>
<td>The discharge summary contributed to my sense of shared patient management with CR</td>
<td>3.78±0.90</td>
<td></td>
</tr>
<tr>
<td>The discharge summary met my needs</td>
<td>3.77±0.85</td>
<td></td>
</tr>
<tr>
<td>All necessary information was included in the discharge summary</td>
<td>3.77±0.92</td>
<td></td>
</tr>
<tr>
<td>I was satisfied with the time from patient discharge to summary receipt</td>
<td>3.77±0.98</td>
<td></td>
</tr>
<tr>
<td>Receiving a discharge summary from CR makes me more likely to refer my patients</td>
<td>3.69±0.89</td>
<td></td>
</tr>
<tr>
<td>I will likely go back and refer to the information in the discharge summary again at a later time</td>
<td>3.58±0.96</td>
<td></td>
</tr>
<tr>
<td>The discharge summary included nonuseful information</td>
<td>2.70±1.04</td>
<td></td>
</tr>
</tbody>
</table>

CR indicates cardiac rehabilitation. Ratings on a 5-point Likert scale, from 1 strongly disagree to 5 strongly agree.
the CR discharge summary useful in managing patient risk factors. Information considered most important was medication, followed by the patient care plan, clinical status, and exercise test results. However, although the patient care plan was summarized in almost all summaries received, one fifth of summaries did not include medication information, and one quarter did not include clinical status. These findings are congruent with other studies examining CR and non-CR discharge summaries in which physicians considered medication information more important than the other data elements. The least important information desired by PCPs was intake-discharge risk factor change, risk score, and psychological assessment data.

It is recommended in both Canadian and American guidelines that CR staff should communicate with physicians to help coordinate risk factor management and to promote lifelong adherence to lifestyle and pharmacological therapies. Although this recommendation is somewhat loose, working toward fulfilling this recommendation through the standardization of CR discharge summary content needs to be pursued. The Canadian guidelines elaborated on further specific information that should be communicated for risk factor management (shown in Table 2), and Riley et al proposed a minimum data set to include in CR discharge summaries based on PCP feedback during structured interviews. Further research should synthesize the recommendations with PCP feedback from both the present study and the study conducted by Riley et al to establish a core set of elements for rigorous evaluation.

### Limitations

Our study has several limitations. First, the low PCP response rate suggests volunteer bias, bringing the representativeness of the sample into question. However, physician response rates are generally lower than that observed in patient or other samples, and physicians as a group are more homogeneous in terms of knowledge, training, attitudes, and behavior than the nonphysician population. Second, female PCPs and those who graduated more recently from medical school were significantly more likely to participate in the study than male and longer-practicing PCPs. Furthermore, we compared the sex of PCPs from our sample with the Canadian Medical Association master files (available online at http://www.cma.ca/index.cfm/ci_id_16959/la_is.htm#1) and found no significant differences in the proportion of female PCPs in this study compared with national data (40.6% versus 36.5%; \( P = 0.49 \)).

Third, generalizability of the patient sample is also unknown because the patient response rate was not ascertained. We should have ascertained the total number of participants initiating CR during the recruitment phase of the study so that generalizability could have been established, but for ethical/privacy reasons, we do not have information on approached patients who declined to participate. However, given that the PCPs were the subjects of interest in this study, this would likely not have affected the results. Fourth, CR sites were not blinded to the study objectives. Rates of CR transmission are likely overestimates as a result of a Hawthorne effect whereby CR sites may have optimized the content and flow of CR discharge summaries. Fifth, we did not audit actual transmission letters for content and compare them with PCP reports to validate whether key information were present or not; thus, some error should be assumed. Finally, no objective indicators of patient outcomes were assessed, so conclusions on the effect of CR summary transmission on patient outcomes cannot be drawn.

In conclusion, despite published performance measures, only 50% of PCPs received a CR discharge summary for their patients, and receipt varied significantly by CR site. When the CR summary was received, PCPs were highly satisfied with the organization, clarity, and utility of the summaries, regardless of program. However, CR programs should more often provide patient medication information and clinical status in their summaries. Although more clinical evidence supporting the effects of CR summary transmission is needed, results suggest that more standardized strategies for CR summary information gathering, generation, and transmission are required.

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### Disclosures

None.

### References


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Cardiac Rehab Discharge Summaries


3. Balady GJ, Williams MA, Ades PA, Bittner V, Comos S, Parodi JA, Franklin B, Sanderson B, Southard D; American Heart Association Exercise, Cardiac Rehabilitation, and Prevention Committee; Council on Clinical Cardiology; Councils on Cardiovascular Nursing, Epidemiology and Prevention, and Nutrition, Physical Activity, and Metabolism; American Association of Cardiovascular and Pulmonary Rehabilitation. Core components of cardiac rehabilitation/secondary prevention programs: 2007 update: a scientific statement from the American Heart Association Exercise, Cardiac Rehabilitation, and Prevention Committee, the Council on Clinical Cardiology; the Councils on Cardiovascular Nursing, Epidemiology and Prevention, and Nutrition, Physical Activity, and Metabolism; and the American Association of Cardiovascular and Pulmonary Rehabilitation. J Cardiopulm Rehabil Prev. 2007;27:121–129.


Primary Care Provider Receipt of Cardiac Rehabilitation Discharge Summaries: Are They Getting What They Want to Promote Long-term Risk Reduction?
Peter A. Polyzotis, Neville Suskin, Karen Unsworth, Robert D. Reid, Veronica Jamnik, Cynthia Parsons and Sherry L. Grace

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1. How satisfied are you with the cardiac rehabilitation discharge summary? (please check one)
   □ Very unsatisfied  □ Somewhat unsatisfied  □ Neither satisfied
   □ Somewhat satisfied  □ Very satisfied

2. Did you receive the discharge summary in time for a post-cardiac rehabilitation patient visit?
   □ Yes
   □ No
   □ I have not had a follow up visit with this patient since receiving the discharge summary

3. Did you use the information found in the discharge summary in patient care?
   □ Yes
   □ No
   □ No, but I will
   Please describe:

4. Was there any desired information that was not present in the discharge summary?
   □ Yes
   □ No
   If YES, please describe:

5. Please rate your perception of the usefulness of the following aspects of the discharge summary (please check 1 box per question):

<table>
<thead>
<tr>
<th></th>
<th>Not at all Useful</th>
<th>Very Useful</th>
<th>Not Reported</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. clinical status (CCS and NYHA class)</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>b. medication dose and frequency</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>c. risk factors (actual)</td>
<td></td>
<td></td>
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<tr>
<td>d. risk factors (targets from recent guidelines)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>e. intake and discharge risk factor measurements to show change</td>
<td></td>
<td></td>
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<tr>
<td>f. exercise test results</td>
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<td></td>
<td></td>
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<tr>
<td>g. risk score</td>
<td></td>
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<tr>
<td>h. patient care plan</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>i. psychological status</td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>

6. If you had the choice, what would be your preferred mode of discharge summary receipt? (please check only one)
   □ Fax
   □ Regular Mail
   □ Web
   □ Email
   □ I would rather not receive a discharge summary
   WHY?
7. Please indicate the degree to which you agree or disagree with the following statements (please ☐ check one box per question):

| a. Receiving a discharge summary from cardiac rehabilitation makes me more likely to refer my patients. |
| b. I was satisfied with the length of the discharge summary. |
| c. I used information in the discharge summary to manage my patient’s risk factors. |
| d. All necessary information was included in the discharge summary. |
| e. I was satisfied with the organization of the discharge summary. |
| f. I was satisfied with the time from patient discharge to summary receipt. |
| g. The discharge summary was of high quality. |
| h. I will likely go back and refer to the information in the discharge summary again at a later time. |
| i. The discharge summary contained information I didn’t need. |
| j. The discharge summary met my needs. |
| k. The discharge summary was easy to understand. |
| l. I was satisfied with the length of time required to read the discharge summary. |
| m. I used information in the discharge summary to manage my patient’s medications. |
| n. I used information in the discharge summary to manage my patient’s weight. |
| o. I used information in the discharge summary to manage my patient’s exercise habits. |
| p. The discharge summary contributed to my sense of shared patient management with cardiac rehab. |

8. Are there any other comments you would like to make about discharge communication from cardiac rehabilitation?

___________________________________________________________________________
___________________________________________________________________________
___________________________________________________________________________

9. How many patients do you see in an average week? _________________________

10. Do you work in a Family Health Team?
    ☐ No        ☐ Yes