Remote Delivery of Cardiac Rehabilitation

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Cardiac rehabilitation provides significant benefit for persons with cardiovascular disease yet geographic access to on-site programs is problematic in VA

Purpose: test the feasibility and safety of a Phase 2 outpatient remote cardiac rehabilitation program
  - Clinical outcomes
  - Patient and provider acceptance & uptake
  - Safety
  - Compare costs of home-based program to fee-basis CR costs
Participants

- Inclusion criteria
  - acute myocardial infarction/acute coronary syndrome
  - post coronary artery bypass graft surgery (CABG)
  - percutaneous coronary intervention
  - stable angina
  - age 18 years or older
  - English speaking
  - medically cleared by cardiology to participate
Participants

- **Exclusion criteria**
  - decompensated congestive heart failure
  - unstable angina
  - complex ventricular arrhythmias
  - CABG surgery redo
  - ejection fraction (EF)<35%
  - history of arrhythmia with syncope
  - severe symptomatic valvular disease
  - resting systolic blood pressure >200 mm Hg or diastolic blood pressure >100 mm Hg
  - dementia or other cognitive impairment
  - life expectancy less than one year due to advanced medical illness
  - other medical illness precluding participation.
Enrollment

- Screened patients
  - Inpatient admissions
  - Cath lab
  - Cardiology Clinic
- Physicians approached re: suitability
- Patients were given a choice of the remote or face-to-face program
- Approached while hospitalized, or at the hospital, for enrollment
- If local program selected, referral to VA staff to arrange for enrollment
- Physicians entered consult in CPRS
Based on a Phase 2 CR program endorsed by the American Heart Association (AHA)

AHA workbook and DVD “An Active Partnership for the Health of Your Heart”

Investigator developed patient workbook (logs for recording exercise; food diaries; written instructions for equipment provided; and written materials to supplement the Active Partnership book)

Individualized exercise prescription; asked to exercise (i.e., walking, or upper arm exercise for individuals with limited mobility) ideally at least 30 minutes 3 times per week
Intervention

- Provided participants with portable exercise peddler, pedometer, heart rate monitor, and blood pressure cuff
- Participants were also instructed how to contact local EMS in the event of chest pain or a medical emergency
- Weekly scheduled phone calls with study staff for 12 weeks
107 eligible patients
- 45 refused participation
- 62 participated
  - 48 (77%) chose home-based program
  - 14 (23%) chose local program

Mean age of 64 (SD 7.5) years.

- Caucasian
- Male
- High school education
- Two-thirds married
Participants

- Reason for referral
  - PCI/Stent (n=25)
  - Stable Angina (n=18)
  - AMI/ACS (n=9)
  - Post CABG (n=7)
  - Other CAD (n=3)
Outcomes

- Blood Pressure
- Heart Rate
- Cholesterol, high density lipoprotein, low density lipoprotein, triglycerides
- Body mass index
- Self-Reported Medication Taking
- Geriatric Depression Scale
- Seattle Angina Questionnaire (Physical Limitation, Angina Stability, Angina Frequency, Treatment Satisfaction, Disease Perception)
- Knowledge
- Satisfaction with home-based program
- Costs
Results

- No significant changes over time between groups at 12-weeks in outcomes, hospitalizations, or ER visits
- Remote CR participants high completion rate
  - Attended 89% of scheduled sessions
- Face-to-face CR program completed 73% of authorized visits
  - One patient did not attend CR because of the distance from home
- Face-to-face participants traveled an average of 15 miles round trip to attend onsite programs (range 3 to 36 miles)
Satisfaction of Remote Participants

<table>
<thead>
<tr>
<th>Question</th>
<th>Mean (SD)*</th>
</tr>
</thead>
<tbody>
<tr>
<td>The information I was given about the program before I started was helpful</td>
<td>4.6 (0.6)</td>
</tr>
<tr>
<td>The educational information given to me during the rehab program was helpful</td>
<td>4.7 (0.5)</td>
</tr>
<tr>
<td>Completing the rehab program at home was convenient</td>
<td>4.8 (0.5)</td>
</tr>
<tr>
<td>The person who guided my cardiac rehab was helpful</td>
<td>4.8 (0.4)</td>
</tr>
<tr>
<td>The person who guided my cardiac rehab had a good understanding of my medical condition</td>
<td>4.7 (0.6)</td>
</tr>
<tr>
<td>I would recommend this program to other veterans who would need it</td>
<td>4.8 (0.4)</td>
</tr>
</tbody>
</table>

*Rating scale: 1=strongly disagree; 2=disagree; 3=neutral; 4=agree; 5=strongly agree
## Costs

<table>
<thead>
<tr>
<th></th>
<th>Using Estimated Costs for Remote Program as Administered</th>
<th>Actual Estimated costs for a constant panel of 100 patients/year</th>
</tr>
</thead>
<tbody>
<tr>
<td>Contract cost per patient(^1)</td>
<td>$1,157</td>
<td>$1,157</td>
</tr>
<tr>
<td>Remote delivery cost per patient(^2)</td>
<td>$1,245</td>
<td>$807</td>
</tr>
<tr>
<td>Absolute difference</td>
<td>$88</td>
<td>$350</td>
</tr>
</tbody>
</table>

\(^1\) costs for contract patients are actual mean cost per patient referred

\(^2\) using GS-9 salary therapist
Conclusions

- Remote CR participants remained engaged in the program and outcomes were comparable between groups.
- Drop-out rate was low and there were no adverse events.
- Home-based CR is not only safe and effective, but brings services closer to the patient and their home, a fundamental principal in the improvement of care for rural patients.