AACVPR
American Association of Cardiovascular and Pulmonary Rehabilitation

Cardiac Rehabilitation Enrollment Strategy

ECG Monitoring Based on Clinical Need

Subject	Content
Definition/Description	Minimize (or de-emphasize) ECG-monitoring frequency for patients at low- to moderate risk of events while in CR in order to accommodate more patients
Key Terms/ Abbreviations	• CR = cardiac rehabilitation • ECG = electrocardiogram
Background and Purpose	AACVPR recommends adjusting levels or intensities of ECG-monitoring of patients during the outpatient training phase of CR based on clinical need and patient safety. Procedures include graduated processes with an initial intensive phase of continuous ECG monitoring followed by intermittent monitoring over the course of the program, or basing the level of monitoring on the patient's risk of cardiac events during exercise; low risk patients would be monitored less frequently than high risk patients. However, it appears from experience in the field that a large majority of CR programs (approx. 90% or more based on AACVPR registry projections) are monitoring every patient every session. In many instances the practice of ECG-monitoring for every patient causes programs to limit the number of patients in a class to the number of telemetry channels they have on hand (personal communication). This practice could be a barrier to participation for many patients. Reasons for this practice include the erroneous beliefs by programs that they are required to perform ECG monitoring in order to be reimbursed for their charges, or that by monitoring the ECG they may be preventing events or promoting beneficial changes in therapy. However, research indicates that "modified" CR programs that limit ECG monitoring are both cost-effective and safe, while potentially improving patient adherence (Carlson, 2000). Current Medicare regulations do not mandate that CR sessions be ECG-monitored. Per American Medical Association definitions of CR CPT codes, sessions may be with ECG-monitoring (93798) or without ECG-monitoring (93797) (CPT Manual). Both procedure codes are reimbursed by Medicare at the same rate in a hospital outpatient setting. Some commercial payers may not recognize CPT 93797, so coverage of this code needs to be determined on a case-by-case basis.

	Moreover, research shows: • Adverse events (defined as cardiac arrest, sudden death, or myocardial infarction) in modern center-based CR programs are very low—approximately 1 event in 400,000-800,000 patient-hours of exercise (Pavy, 2006; Saito, 2014) and not significantly different than home-based, non-monitored programs (Dalal, 2010). The extent of ECG monitoring also does not impact adverse events (Van Camp, 1986). Unexpected events such as new-onset atrial fibrillation, sustained and non-sustained supraventricular tachycardia, and ischemic ST changes occur more frequently, especially during the first 2-4 weeks of CR, but do not generally result in a modification of therapy in most patients (Keteyian, 1995; Vongvanich, 1996). • Stratifying patients and setting monitoring policies based on "risk" also does not appear to predict events in CR (Merz, 2000; Grall, 2000). • It has been hypothesized, in fact, that excessive monitoring may lessen patients' self-efficacy to exercise independently and may decrease program attendance (Carlson, 2001). **The conclusion is that continuous ECG monitoring during supervised CR is of little value in stable low- to moderate risk patients and of only moderate value in high-risk patients in supervised settings.** Therefore, by changing policies and limiting the time period or reducing the frequency of ECG monitoring during group exercise sessions it may be possible to include more patients per class. A program currently limiting the number of patients to the number of telemetry channels could increase the number of patients in a class, since not all patients would not need monitoring. For example, in a program with an 8-channel ECG monitoring system, instead of 1 staff person at the monitoring station and 1-2 staff supervising 8 patients—a 1:3-4 ratio of staff to patients—the new staff:patient ratio in a group/class setting that uses reduced monitoring frequency might be 1:6-7.
Relevant Metric(s)	Number of ECG-monitored exercise sessions per patient
Process Description/ Processes Impacted	Many models for graduated or intermittent ECG-monitoring policies for a typical 12-36 week duration CR program have been proposed: 1. Continuous ECG monitoring for the first 2-3 sessions, then intermittent (such as during each 30-day review) or as needed monitoring during the duration of the program. 2. Continuous ECG monitoring for the first month, then a reduced frequency during the second month, and no monitoring during the last month.

	3. Basing frequency of ECG monitoring on risk of events during exercise, with low risk patients having few to no monitored sessions, high risk patients being monitored every session, and intermediate patients being monitored somewhere in between.
Key People/ Departments to Engage	It would require (a) buy-in from CR program staff who may be reluctant to de-emphasize ECG monitoring, (b) a supportive Medical Director, and (c) understanding from department and hospital administration that reduced ECG-monitoring <u>may</u> decrease patient revenue, because reimbursement from some health insurance payers may be less for non-ECG monitored sessions than for ECG-monitored sessions. (As noted above, Medicare reimburses the same regardless of ECG telemetry monitoring or not.)
Cost Concerns	It will reduce costs to program in terms of telemetry hardware requirements and disposables (batteries, electrodes, etc.), staffing costs and documentation time, and will reduce burden to patient in terms of less intrusiveness. But, as stated above, there may be a decrease in patient revenue. That said, it is also possible that any decrease in actual revenue may be offset, partially or in-whole, by an increase in patient volume/through-put.
Timeline	Not Applicable.
Supporting Material	Not Applicable.
References	1. AACVPR Guidelines for Cardiac Rehabilitation and Secondary Prevention Programs, 5th ed. 2. Carlson, et al. Program participation, exercise adherence, cardiovascular outcomes, and program cost of traditional versus modified cardiac rehabilitation. *Am J Cardiol*, 2000;86:17-23. 3. Carlson, et al. Self-efficacy, psychosocial factors, and exercise behavior in traditional versus modified cardiac rehabilitation. *JCR*, 2001;21:363-373. 4. Current Procedural Terminology Manual, AMA, 2011, p 499. 5. Dalal, et al. Home based versus centre based cardiac rehabilitation: Cochrane systematic review and meta-analysis. *BMJ*, 2010;340:b5631 doi:10.1136/bmj.b5631. 6. Grall, et al. The usefulness of continuous ECG monitoring in risk stratified Phase II cardiac rehabilitation patients. *Clin Exerc Physiol*, 2000;2:133-140 7. Keteyian, et al. Electrocardiographic monitoring during cardiac rehabilitation. *Chest*, 1995;107:1242-1246 8. Merz, et al. Time to reevaluate risk stratification guidelines for medically supervised exercise training in patients with coronary

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