Effective Health Care
Implantable Cardioverter Defibrillator for Primary Prevention of Sudden Cardiac Arrest
Nomination Summary Document

Results of Topic Selection Process & Next Steps

- Implantable cardioverter defibrillator (ICD) for primary prevention of sudden cardiac arrest (SCA) was found to be addressed by an in-process AHRQ technology assessment. Given that the in-process technology assessment covers this nomination, no further activity will be undertaken on this topic.

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Topic Description

Nominator: Organization

Nomination Summary: The nominator is interested in a systematic review of the various approaches to risk stratification for identifying those who should use an ICD for primary prevention of SCA.

Staff-Generated PICO:
Population(s): All patients with risk factors for SCA, including both post-myocardial infarction and heart failure patients
   Subgroups to include in analysis:
   1) Patients with known severe left ventricular systolic dysfunction
   2) Women vs. men
   3) Elderly patients
Intervention(s) for risk stratification:
1) Left ventricular ejection fraction assessment
2) Electrophysiology study
3) Heart rate variability
4) Microvolt T-wave alternans testing
5) Myocardial perfusion Single Photon Emission Computed Tomography (SPECT) scan
6) Cardiac magnetic resonance imaging (MRI)
Comparator(s):
1) One intervention compared to another intervention
2) One intervention compared to no intervention
3) Combination interventions to one intervention
4) Combination intervention to another combination intervention
5) Combination intervention to no intervention
Outcome(s):
All patient-related benefits, including but not limited to:
   - decreased mortality,

- decreased hospitalization, and
- improvement in quality of life;

All patient-related harms, including but not limited to:
- inappropriate ICD firings,
- depression and/or anxiety,
- worsening heart failure, and
- increased mortality

Key Questions from Nominator:	1. Are there safe and effective methods of identifying patients in need of implantable cardioverter defibrillators (ICDs) for the primary prevention of sudden cardiac arrest (SCA)?

Considerations

- The topic meets EHC Program appropriateness and importance criteria. (For more information, see http://effectivehealthcare.ahrq.gov/index.cfm/submit-a-suggestion-for-research/how-are-research-topics-chosen/.)

- The topic was found to be addressed by an in-process AHRQ technology assessment titled *Implantable Defibrillators and the Evidence for Primary Prevention of Sudden Cardiac Death*.

- In addition, there have been several recent reviews pertaining to some of the risk stratification tools currently being utilized.

  - A 2012 review by Kelsidis and colleagues focuses on the use of radionuclide imaging to identify patients at risk for sudden cardiac death and describes the performance of this type of imaging in comparison to left ventricular ejection fraction, New York Heart Association class, and ECG parameters.
    - Kelesidis I, Travin MI. Use of cardiac radionuclide imaging to identify patients at risk for arrhythmic sudden cardiac death. Journal of Nuclear Cardiology 2012; 19(1): 142-52.

  - A 2012 meta-analysis by Gupta and colleagues was performed to determine the ability of microvolt T-wave alternans (MTWA) to modify risk assessment of ventricular tachyarrhythmic events and sudden cardiac death.
    - Gupta A, Hoang DD, Karliner L, et al. Ability of microvolt T-wave alternans to modify risk assessment of ventricular tachyarrhythmic events: a meta-analysis. American Heart Journal 2012; 163(3): 354-364.

  - A 2011 review by Laszlo and colleagues describes the utility of genetic polymorphisms for risk stratification of patients who may have hereditary risk of sudden cardiac death.
    - Laszlo R, Busch MC, Schreieck J. Genetic polymorphisms as risk stratification tool in primary preventive ICD therapy. ISRN Cardiology 2011; 2011: 457247.

  - A 2009 review by Gang and colleagues examines heart rate variability in risk stratification for sudden cardiac death.
    - Gang Y, Malik M. Non-invasive risk stratification for implantable cardioverter-defibrillator placement—heart rate variability. The American Heart Hospital Journal 2009; 7(1): 39-44.