What Are the Clinical and Economic Implications of Following MADIT-II Criteria for Surgically Implanting Automatic Cardiac Defibrillators?

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The full report is titled "Clinical and Economic Implications of the Multicenter Automatic Defibrillator Implantation Trial-II." It is in the 19 April 2005 issue of *Annals of Internal Medicine*. The authors are S.M. Al-Khatib, K.J. Anstrom, E.L. Eisenstein, E.D. Peterson, J.G. Jollis, D.B. Mark, Y. Li, C.M. O'Connor, L.K. Shaw, and R.M. Califf.

What is the problem and what is known about it so far?

About 300,000 people die each year because their heart rhythm suddenly changes, causing the heart to quiver rather than pump blood effectively. A surgically implanted device known as an implantable cardioverter defibrillator (ICD) can deliver an electrical shock to the heart that restores its normal rhythm. A recent study, the Multicenter Automatic Defibrillator Implantation Trial (MADIT)-II, compared patients who received an ICD with a matched group who did not. This trial indicated that many patients who would not previously have received an ICD could benefit from its use. The problem is that ICD implantation is very expensive and should be used only in those most likely to benefit.

Why did the researchers do this particular study?

To determine the cost to society as a whole of following the MADIT-II recommendations.

Who was studied?

Instead of studying new patients, the researchers reviewed the medical records of 1285 patients who had undergone cardiac catheterization at Duke University Medical Center between 1986 and 2001 and would have fit the MADIT-II criteria. None of these patients received an ICD because they were treated before MADIT-II results were published.

How was the study done?

The researchers examined patients in the Duke database (which included follow-up information about duration of survival) and compared them with MADIT-II patients who had not received an ICD to determine whether the 2 groups were similar. They then did hypothetical calculations to estimate how much longer the Duke patients would have survived had they received an ICD. Next, they estimated the total cost of care for the Duke patients as if they had received an ICD and compared this cost with the long-term costs that were incurred without an ICD. Finally, they calculated the extra cost of each additional year of life provided by having an ICD implanted.

What did the researchers find?

Overall, the Duke patients lived as long as the MADIT-II patients who did not receive an ICD, showing that severity of disease was similar in both groups. If the Duke patients had received ICDs, they could have expected to live an average of 1.8 years longer. The excess cost of having an ICD was calculated at $50,500 per extra year of life gained.

What are the limitations of the study?

The calculations depend on a hypothetical group of patients rather than actual patients. Furthermore, the Duke patients were referred to a research center and may not have been representative of all patients who fit MADIT-II criteria.

What are the implications of the study?

Although the cost of implanting ICDs is within a range generally regarded as acceptable, the large number of patients eligible under MADIT-II criteria may strain the ability of society to respond.