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The full report is titled “Systematic Review: Cardiac Resynchronization in Patients with Symptomatic Heart Failure.” It is in the 7 September 2004 issue of *Annals of Internal Medicine* (volume 141, pages ●●●-●●●). The authors are F.A. McAlister, J.A. Ezekowitz, N. Wiebe, B. Rowe, C. Spooner, E. Crumley, L. Hartling, T. Klassen, and W. Abraham.

## Cardiac Resynchronization Therapy for Heart Failure

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

In heart failure, the heart does not pump blood as well as it should and fluid builds up in the lungs. The symptoms of heart failure include difficulty breathing, decreased ability to exercise, and leg swelling. Although many drugs help patients with heart failure, there is no cure. The condition is disabling and even fatal for many patients. In patients with heart failure, conduction of electrical impulses through the heart is often abnormal. This abnormal conduction, in turn, can lead to uncoordinated contraction of the ventricles, the large pumping chambers of the heart. Cardiac resynchronization is a newer heart failure treatment that uses a special type of pacemaker to synchronize the contraction of the ventricles. Cardiac resynchronization improves quality of life and exercise ability, but its effect on survival has been less clear. Only one study has been large enough to show that this therapy may improve survival.

### Why did the authors do this review?

To combine all the information from studies of cardiac resynchronization therapy for heart failure.

### How did the authors do this review?

The authors reviewed the published literature for studies that assigned patients at random to receive cardiac resynchronization therapy or usual medical therapy. The authors used a statistical method called meta-analysis to combine the results of the separate studies in order to better estimate the true effect of the therapy on patient outcomes. To evaluate the safety of cardiac resynchronization, they searched the literature for any study of cardiac resynchronization therapy. For the review of the safety of this therapy, the included studies did not have to involve random assignment to resynchronization or medical therapy.

### What did the authors find?

For the estimates of effect on patient outcomes, the authors identified 9 studies that included 3216 patients with heart failure. All patients in these studies had moderately severe, symptomatic heart failure and an electrocardiogram abnormality called a prolonged QRS duration. After combining the results of these 9 studies, the authors concluded that cardiac resynchronization improved quality of life, exercise ability, hospitalization for heart failure, and survival. The authors found 18 studies for the safety analysis. These studies suggested that pacemaker placement was successful in about 90% of patients and that few patients died while the pacemaker was being implanted. However, over the 6 months after cardiac resynchronization therapy, the pacemaker dislodged from proper placement in 9% of patients and malfunctioned in 7%.

### What are the implications of the review?

In selected patients with heart failure, cardiac resynchronization therapy improves outcomes. However, problems can occur in the months after pacemaker placement.