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**Advancing the Field of Regenerative Medicine**

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Active clinical trials and ongoing preclinical work are advancing the development of cell-based therapies for heart failure and vascular disease. Clinical trial designs are taking on an increasingly sophisticated design in order to test and compare whole bone marrow and its leading constituents, as well as cardiac stem cells as components of novel cell basedtherapies. Important trial design considerations include adequate sample size, patient population, and appropriate endpoint selection. There are several key studies that have advanced the field notably: The following European trial testing improved ventricular remodeling as reported byVroteovec et al. **(2011):**Effects Intracoronary Stem Cell Transplantation in Patients With Dilated Cardiomyopathy; suggested improvement in left ventricular function and clinical status of patients with CD34+ cell therapy1.US publications of recent findings include the Poseidon Randomized Trial by Hare et al**. (2012):** Comparison of Allogeneic vsAutologous Bone Marrow-Derived Mesenchymal Stem Cells Delivered by TransendocardialInjection in Patients With Ischemic Cardiomyopathy2. The SCIPIO trial by Bolli et al. **(2011)** represents a first in man trial of cardiac specific stem cells:Stem Cell Infusion in Patients With Ischemic Cardiomyopathy, APhase I Randomized, Open-label Trial of CSCs in Patients With Postinfarction LV Dysfunction Who Underwent Coronary Bypass Surgery, steered away from the traditional bone marrow source and targeted the heart itself to cultivate cardiac c-kit cells3.Vroteovec and Hare utilized the bone marrow and its derivatives for their trials. Collectively, these studiesillustratea favorableimprovement inpatients’ functional capacity, quality of life and ventricular remodeling.

Researchers continue to move towardmore provocative strategies in order toconduct stronger, more robust clinical trials in an effort to identify the best cell type and the safest and most advantageouscell delivery method. In this regard several phase III trials are now underway or are being planned.This forward progress holds great promise for the new field of regenerativemedicine for adverse heart conditions and other diseases.

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