

# Source of stem cells used for bone marrow failure treatment varies worldwide

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Ayami Yoshimi, M.D., Ph.D., of the University of Freiburg, Germany, and colleagues examined the use of peripheral blood stem cells and bone marrow as stem cell sources for hematopoietic stem cell transplantation in patients with bone marrow failure worldwide and factors associated with the use of each stem cell source. The study appears in the January 12 issue of *JAMA*.

Hematopoietic stem cell transplantation (HSCT) is a therapeutic option for many [patients](#) with [bone marrow failure](#). Bone marrow was initially the only stem cell source available until the 1990s when peripheral [blood stem cells](#) (PBSCs) and cord blood began to be used. Currently, PBSCs are the major stem cell source, owing to faster engraftment and ease of collection despite a higher rate of graft-vs-host disease and lower survival rates in patients with nonmalignant disorders. Bone marrow is currently recommended for HSCT in patients with bone marrow failure.

For this study, the researchers used data from retrospective HSCT surveys by the Worldwide Network for Blood and Marrow Transplantation. International and regional organizations collect the numbers of transplants annually by disease, donor type, and stem cell source from countries known to perform HSCT in World Health Organization (WHO) member states. Most data are from transplant registries.

Among 194 WHO member states, 84 perform HSCT and 74 reported at least 1 HSCT during 2009 through 2010. Among 114,217 HSCTs

reported by 1,482 transplant teams, 3,282 allogeneic (receipt of [stem cells](#) from another individual) HSCTs were performed for bone marrow failure. Donor type and stem cell source differed between regions. Of these HSCTs, the stem cell sources were bone marrow (54 percent), PBSC (41 percent), and cord blood (5 percent).

Bone marrow was used most commonly in the Americas (75 percent) and in Europe (60 percent), but not in the Eastern Mediterranean region and Africa (46 percent) and in the Asia Pacific region (41 percent; excluding Japan, 19 percent). The use of bone marrow increased from 20 percent in countries with low and low-middle incomes to 50 percent with high-middle incomes to 64 percent with high incomes. The gross national income per capita and stem cell source had a weak but significant association.

The authors write that PBSCs are still used, despite disadvantages in patients with bone marrow failure, most likely because centers obtain PBSCs routinely for other indications and cell separators are available at any transplant center. "These cells are associated with rapid engraftment, a cost-reducing benefit. By contrast, bone marrow harvest requires trained physicians, specific equipment, and hospitalization of the donor. The correlations with gross national income per capita support the hypothesis that short-term financial considerations are important."

"National and international transplant organizations and authorities should foster regional-accredited bone marrow harvest centers for patients with nonmalignant disorders and provide resources to establish such infrastructures. Unrelated donor registries should provide information on the necessity of bone marrow donation for patients with [bone marrow](#) failure."

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