

## Most Patients who Need an Allo Transplant Can Find a Well Matched Donor

### Important Points:

- Most patients can find a well matched or a very well matched available adult donor in the Be The Match Registry.
- Most patients can find a well matched cord blood unit that is big enough in the registry, but few patients can find a very well matched cord blood unit.
- Almost all patients younger than 20 years old can find a well matched adult donor or cord blood unit.
- It is important to find the best donor as soon as possible, so the transplant isn't delayed. If a very well matched donor isn't available, it is better to use a well matched donor than to wait to try to find a very well matched one.

Many patients with blood cancers and other diseases are cured by an allogeneic hematopoietic stem cell transplant (allo transplant). An allo transplant uses healthy blood cells from a donor to replace the patient's unhealthy cells. However, the donor's cells must very closely match the patient's cells.

To see if cells match, doctors look at the HLA genes of the cells. People have two copies of HLA genes. One is inherited from their mother and one from their father. Because HLA genes are inherited, a patient is most likely to find a match within their own racial or ethnic group. Some HLA genes are more common in certain racial and ethnic groups. If a patient has uncommon HLA genes, they may have more trouble finding a match.

To find a donor, doctors first test the patient's family members to see if their cells match. About 30% (3 in 10) of patients have a matching family member. For other patients, doctors look for an unrelated donor in large registries of volunteers, such as the Be The Match Registry. The donated cells might come from an adult donor or an umbilical cord blood unit.

Researchers wanted to know: if a patient does not have a family member whose cells match, will they find a match in the Be The Match Registry? For the patients, they looked at 21 racial and ethnic groups. For the donors, they looked at adult donors and cord blood units, and they considered availability.

## ADULT DONOR

Match

To see if a patient's cells match an adult donor's, doctors look at 4 HLA genes: HLA-A, HLA-B, HLA-C, and HLA-DRB1. If the patient and donor cells match at all 4 of these HLA genes, it is called an 8/8 HLA match. They are very well matched. If there is 1 mismatch with any of the HLA genes, it is called a 7/8 HLA match. They are well matched.

Availability

Sometimes donors who volunteered to be in the registry aren't able to donate. Therefore, the researchers figured out the chance of a donor being available in each racial and ethnic group.

Results

The researchers found that most patients can find a well matched or a very well matched available adult donor in the registry. The chances of finding a well matched available donor are different for different racial and ethnic groups. For example, the chances for a few racial and ethnic groups are listed below.

- Whites of European descent, meaning they or their family members came from Europe, have a 75% (3 out of 4) chance of finding a very well matched available donor. They have a 97% (97 out of 100) chance of finding a well matched or a very well matched available donor.
- African Americans have a 19% (about 2 out of 10) chance of finding a very well matched available donor. They have a 76% (about 3 out of 4) chance of finding a well matched or a very well matched available donor.
- Americans of Mexican descent have a 37% (about 4 out of 10) chance of finding a very well matched available donor. They have an 87% (about 9 out of 10) chance of finding a well matched or a very well matched available donor.

**Chance of Finding a Matched Available Adult Donor – Results Summary Table**

Racial and Ethnic Group	<u>Very</u> Well Matched	<u>Very</u> Well Matched or Well Matched
White European	75%	97%
African American	19%	76%
Mexican	37%	87%

## CORD BLOOD UNIT

### Match

To see if a patient's cells match a cord blood unit, doctors look at 3 HLA genes: HLA-A, HLA-B, and HLA-DRB1. If the patient and donor cells match at all 3 of these HLA genes, it is called a 6/6 HLA match. They are very well matched. If there is 1 mismatch with any of the HLA genes, it is called a 5/6 HLA match. If there are 2 mismatches, it is called a 4/6 HLA match. For cord blood units, 5/6 and 4/6 HLA matches are considered well matched.

### Availability

Cord blood units have fewer stem cells to transplant than adult donors, so doctors must make sure the cord blood unit is big enough for the patient. The number of healthy cells a patient needs is based on their weight. Heavier patients need more cells.

In this study, the researchers looked at patients' weights for two different age groups: 20 years and older vs. less than 20 years old. Then the researchers figured out the chance of a cord blood unit being available for each age group for each racial and ethnic group.

### Results

The researchers found that most patients can find a well matched cord blood unit that is big enough in the registry. Almost all patients younger than 20 years old can find a well matched cord blood unit that is big enough. It doesn't matter which racial and ethnic group they're in. However, few patients in any racial and ethnic group can find a very well matched cord blood unit that is big enough.

The chances of finding a well matched cord blood unit that is big enough are different for different racial and ethnic groups and different ages. For example, the chances for a few racial and ethnic groups and ages are listed below.

- Whites of European descent aged 20 years and older have a 17% (about 2 out of 10) chance of finding a very well matched cord blood unit that is big enough. They have a 96% (96 out of 100) chance of finding a well matched or a very well matched cord blood unit that is big enough.
  - Whites of European descent less than 20 years old have a 38% (about 4 out of 10) chance of finding a very well matched cord blood unit that is big enough. They have a 99% (99 out of 100) chance of finding a well matched or a very well matched cord blood unit that is big enough.
- African Americans aged 20 years and older have a 2% (2 out of 100) chance of finding a very well matched cord blood unit that is big enough. They have an 81%

(about 8 out of 10) chance of finding a well matched or a very well matched cord blood unit that is big enough.

- African Americans less than 20 years old have a 6% (6 out of 100) chance of finding a very well matched cord blood unit that is big enough. They have a 95% (95 out of 100) chance of finding a well matched or a very well matched cord blood unit that is big enough.
- Americans of Mexican descent aged 20 years and older have a 6% (6 out of 100) chance of finding a very well matched cord blood unit that is big enough. They have a 91% (about 9 out of 10) chance of finding a well matched or a very well matched cord blood unit that is big enough.
  - Americans of Mexican descent less than 20 years old have a 19% (about 2 out of 10) chance of finding a very well matched cord blood unit that is big enough. They have a 98% (98 out of 100) chance of finding a well matched or a very well matched cord blood unit that is big enough.

**Chance of Finding a Matched Cord Blood Unit - Results Summary Table**

Racial and Ethnic Group	Patients 20 Years and Older		Patients Less than 20 Years Old	
	<u>Very Well Matched</u>	<u>Very Well Matched or Well Matched</u>	<u>Very Well Matched</u>	<u>Very Well Matched or Well Matched</u>
White European	17%	96%	38%	99%
African American	2%	81%	6%	95%
Mexican	6%	91%	19%	98%

**LOOKING FOR A DONOR**

Many doctors look for matched donors in this order:

1. Very well matched adult donor (8/8 HLA match)
2. Well matched adult donor (7/8 HLA match)
3. Very well matched cord blood unit (6/6 HLA match)
4. Well matched cord blood unit (5/6 or 4/6 HLA match)

If doctors look for both available adult donors and cord blood units that are big enough, almost all patients less than 20 years old can find a match. Most patients 20 years and older can also find a match.

The researchers also found that doctors should look for different types of donors at the same time. It is important to find the best donor as soon as possible, so the transplant isn't delayed. If a very well matched donor isn't available, it is better to use a well matched donor than to wait to try to find a very well matched one.

## IMPORTANT POINTS

This information is important because we now know that:

- Most patients can find a well matched or a very well matched available adult donor in the Be The Match Registry.
- Most patients can find a well matched cord blood unit that is big enough in the registry, but few patients can find a very well matched cord blood unit.
- Almost all patients younger than 20 years old can find a well matched available adult donor or cord blood unit that is big enough.
- It is important to find the best donor as soon as possible, so the transplant isn't delayed. If a very well matched donor isn't available, it is better to use a well matched donor than to wait to try to find a very well matched one.

## MORE INFORMATION

More information about this research study, including graphs, is posted on the [Be The Match Clinical website](#).

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### Source:

HLA match likelihoods for hematopoietic stem-cell grafts in the U.S. registry. Gragert L, Eapen M, Williams E, Freeman J, Spellman S, Baitty R, Hartzman R, Rizzo JD, Horowitz M, Confer D, Maiers M. New England Journal of Medicine. 2014 Jul 24; 371:339-348.