

## Healthline with Yale Cancer Center

*Hosts*

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WTIC Newstalk 1080

### Stem Cell Transplantation

### Guest Expert:

**Stuart Seropian, MD**

*Associate Professor of Medicine,  
Yale Cancer Center*



*Healthline with Yale Cancer Center is a weekly broadcast on WTIC Newstalk 1080  
Sunday Mornings at 8:30*

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*This is Healthline, a joint venture of WTIC NewsTalk 1080 and Yale Cancer Center. Yale Cancer Center is a resource for cancer programs throughout Connecticut, developing new advances in prevention, screening, diagnosis, and treatment. On Healthline, you will hear from some of the leading doctors in the country. Healthline is not intended to provide medical advice. Yale Cancer Center urges you to consult with a qualified physician in your community for diagnosis and for answers to your medical questions. And now, our co-hosts, oncologists, Ken Miller and Ed Chu.*

- Miller Good morning and welcome to Healthline. My name is Dr. Ken Miller and I am the Director of the Survivorship Program at the Yale Cancer Center in New Haven. I am here in the WTIC studios today with my colleague and co-host, Dr. Ed Chu, who is the Chief Adult Oncologist at the Yale Cancer Center. Good morning Ed.
- Chu Good morning Ken. Healthline, with the Yale Cancer Center, is our way of giving you the most up-to-date information on cancer care every Sunday morning at 8:30 a.m. Our program features some of the nation's leading oncologists and cancer specialists who are in the forefront of the battle to fight cancer right here in Connecticut.
- Miller Each week, Ed and I are joined by a different expert from the Yale Cancer Center. If you would like to submit a question about cancer to Healthline, please e-mail us at [healthline@yale.edu](mailto:healthline@yale.edu) and we will share them with the expert visiting with us. If you would like to listen to past editions of Healthline, or to learn more about a specific kind of cancer, all of our shows are now available at the Yale Cancer Center website which is [www.yalecancercenter.org](http://www.yalecancercenter.org).
- Chu Today our special guest expert is Dr. Stuart Seropian, Associate Professor of Medicine in Medical Oncology at the Yale Cancer Center, and a leading oncologist in the treatment of hematologic malignancies and bone marrow transplantation right here at the Yale Cancer Center. Stuart, thank you so much for being with us today on Healthline.
- Seropian Good morning. Thank you for the invitation to come and talk about transplants.
- Chu Stuart, let us begin by talking about stem cell transplants. What are they?
- Seropian It is important to provide some definitions because there is confusion about what stem cells are and how they are currently used in medicine. When we talk about stem cell transplants or bone marrow transplants, we are talking about a procedure that is usually used to treat cancers of the blood or the lymphatic system. Simply put, we take stem cells that are able to make blood and we transfer them either from one individual to another, or sometimes from one individual back to that individual, to try and help cure malignancy. Most people have heard the term bone marrow transplant. It is a term that has been around for a long time, and it tells you the cells are coming from the bone marrow, but it is not a very specific term. It doesn't tell you that much about the procedure, because there are many different types of stem cell transplant.

- Miller Let us start out by talking about when someone gets their stem cells back, which you just mentioned. What are some examples of instances where you would recommend that?
- Seropian We refer to that procedure as an autologous stem cell transplant. The term autologous means taking cells from one individual and using them to give back to that individual. We are trying to give more effective chemotherapy or the usual medicines that are used to treat a lot of different cancers. They are very effective for certain cancers like leukemia or non-Hodgkin's lymphoma, and we know from many years of experience that giving very high doses of those chemotherapy drugs can sometimes help to cure people who wouldn't be cured otherwise. Now, this is not only safe to do, but this is where stem cells can be quite helpful to us. For a patient who needs these high doses of chemotherapy, but we're concerned it will effect the blood counts in a serious or dangerous way, we can use the patient's own stem cells and return them after we have administered the high dose chemotherapy. This will help the patient's blood counts recover in a relatively quick fashion and make the procedure safe. An autologous stem cell transplant is a way of giving higher dose chemotherapy in a safe fashion where the stem cells come from the patient to support the patient through the procedure.
- Chu What are the types of cancers that you typically treat with this autologous transplant approach?
- Seropian In order for this procedure to be helpful to the patient, they have to have a cancer that responds to ordinary doses of chemotherapy; this is not a treatment for everybody. Some typical examples would be non-Hodgkin's lymphoma, Hodgkin's disease, some types of what we call germ cell tumors, and testicular cancers. There are other diseases where there has been a lot of research and we think that perhaps this stem cell transplant may be useful. Breast cancer is a controversial issue, and is not a very commonly transplanted disease. The other disease is multiple myeloma, where we've had indications that autologous transplant might help.
- Chu I want to address the issue of stem cell transplant. People think this is a controversial term. Are these the same controversial stem cells?
- Seropian No. It is a good point. We were talking about adult hematopoietic stem cells. That means that these are cells that reside primarily in the bone marrow and in the blood stream and in some organs like the spleen. These are more grown up stem cells, and their purpose is to make blood. These are not the embryonic stem cells that you hear about in the news, but there is still some controversy. These are cells that have actually been identified for many years, back into the 1980's, and we have known they are useful for this sort of procedure for quite a long time, so there is very little controversy about the use of these cells and the issues regarding the use for research and how they are obtained.
- Chu What about allogenic transplantation, which is another term that we hear about?
- Seropian This is why it is important when we talk about transplant to define our terms. When we say someone had a bone marrow transplant for instance, it doesn't tell us if the cells came from the

patient or if they came from a different person. An allogenic transplant is when we need to get the cells to do a transplant from a donor other than the patient themselves; this might be a brother or a sister or another family member, and if family members are not available to donate cells, we can search a database of over 7 million volunteer donors through the National Marrow Donor Registry and look for an unrelated donor who may be compatible with the patient. An allogenic transplant involves a transplant procedure very similar to an autologous transplant in terms of giving high doses of chemotherapy, but the cells come from a different person, and that changes the nature of the procedure.

Miller It sounds like a complex decision to make as to who needs a transplant. Is there a team approach in terms of talking about the patient and trying to figure out who needs one and who doesn't?

Seropian There are a lot of things that go into making that decision. Transplant procedures have risks, and they are not the same for each transplant procedure, and they are not the same for each patient or even each disease. We see patients frequently who are referred to us for opinions that might not even be about a transplant, and they are presented at our weekly transplant conferences. This is a team of physicians, radiotherapists, pathologists, and radiologists, who review all the details of the case, and then make a decision about what the most effective therapy would be. This may be an autologous transplant or an allogenic transplant, or maybe no transplant at all, but we try and balance the risks of the procedure against what we think the benefit of the transplant would be. In most cases, when we suggest for the patient to have a transplant, we are trying to cure that disease. That is not always the case. Multiple myeloma is an example where transplant therapy using the patient's own cells, or autologous transplant, is a therapy we know is very effective in inducing remissions for patients. These remissions often last longer than remissions that can be obtained with any other therapy. It is a very useful treatment, but it is not a treatment that we think of as being likely to cure a patient's disease. It enables them to stop chemotherapy for some time.

Miller We would like to remind you to e-mail your questions to us at [healthline@yale.edu](mailto:healthline@yale.edu). We are going to take a short break for a medical minute. Please stay tuned to learn more information about stem cell transplants with Dr. Stuart Seropian from the Yale Cancer Center.

### *Medical Minute*

*This is a medical minute brought to you as a public service by the Yale Cancer Center. Cancer patients become cancer survivors the first day they are diagnosed. There are over 10 million cancer survivors in the US and the numbers keep growing. However, there are long-term side-effects of cancer including heart problems, osteoporosis, fertility issues, impaired growth, and an increased risk of second cancers. Ending cancer treatment can be both exciting and scary. Most people are relieved to be finished with the demands of treatment but many also feel concerned about whether the cancer will come back and what they can do to prevent a relapse. Cancer survivors require long-term specialized care and support. For more information, log on to [www.yalecancercenter.org](http://www.yalecancercenter.org).*

Miller Welcome back to Healthline. This is Dr. Ken Miller, and I am here with my co-host, Dr. Ed Chu, and our guest, Dr. Stuart Seropian, who is an expert in stem cell transplantation at the Yale Cancer Center.

Chu Stuart, picking up where we left off in the last segment, when do you typically think about using a transplant in a particular patient; is it early on in their treatment course or is it typically reserved after the patients receive multiple cycles of therapy?

Seropian That really depends on the patient and the disease in question. An example of a patient where a transplant might be a very useful therapy early in the course of their disease would be an acute leukemia. Not all patients, but many of these patients, will achieve a remission with standard treatments but we know that, based on the features of their disease, their remission is not going to last for very long. Relapse is often predictable and if we expect that is going to happen in a short period of time, and we have an alternative treatment, namely an allogenic transplant from a matched brother or sister, we will often recommend the transplant in first remission as the best chance to cure the disease. We do know in that particular disease that if patients relapse, it is often difficult to get them in a medical position where they can have a transplant later on and the results aren't as good. For acute leukemia we would suggest a transplant early in the course of their illness.

There are other diseases where this may be effective as well. For instance, in certain types of non-Hodgkin's lymphoma like large B-cell lymphoma, which is one of the more common types of non-Hodgkin's lymphoma. Many patients have a chance for cure with standard therapy, and transplantation in first remission might improve that chance somewhat, but it is not always necessary and it does increase the risk of their therapy. These patients, if they do relapse, are more likely to be in a good position to have a transplant in second remission where the cure rates are still pretty good. This is a disease where, for many patients, we wouldn't necessarily think about transplant in the first remission. If the features of their disease were such that we didn't think that they could stay in remission for long, we might do a transplant in first remission. These are the things that come up at our conferences, and we debate and look at the literature.

Miller I want to ask you a little bit about donors. If someone listening is asked to participate in a donor drive, is that painful? What can they expect?

Seropian Participating in a donor drive is very easy, because it is just a blood sample. It needs to be drawn from the arm. It is no different than going to your doctor needing to have some blood work done. The way that we match donors for allogenic transplant, is we look at certain genes that govern how immune systems see each other. We try and match those up between the patient and the donor. The National Marrow Donor Program keeps a database of all the results of these blood tests with what are referred to as people's HLA-types; genes that we need to know about in order to match a donor and the patient. The national marrow donor program is linked with multiple registries worldwide and we have access to that database and can identify the potential donors for a patient very readily.

- Miller Taking it a step further, if someone has actually chosen to be a donor because they do match, is that a painful procedure?
- Seropian The options for a donor, whether it is someone who is related or unrelated, is to donate either bone marrow or to donate stem cells we get out of the blood. The bone marrow harvest involves going to the operating room and having multiple bone marrow biopsies. This is usually done under general anesthesia or spinal anesthesia, and it can be a bit uncomfortable as you might imagine, not during the procedure, because one is under anesthesia, but afterwards. Discomfort in the hip area can last for a while. This procedure can take an afternoon and people don't have to be out of work necessarily which is appealing to some donors. Blood stem cell collection is a little different. We use medicine called granulocyte-colony stimulating factor, or GCSF. It is kind of like an insulin shot that people take under the skin for a couple of days to help get the stem cells out of the bone marrow and out of any other areas in the body other than blood stream where they may be hiding. It takes a longer period of time. The shots need to be given for a couple of days and then the filtering of blood, which is referred to as pheresis, goes on for a couple of hours each afternoon until we get enough cells. That might be one or two days.
- Chu Is there a difference in outcome whether one is using the peripheral blood cells as opposed to the bone marrow harvest?
- Seropian There are some differences in the product and some differences in which one someone would like to use. For autologous transplant, where a patient uses their own cells, we always use the peripheral blood stem cells. We harvest them out of the blood stream. The reason for that is that the stem cell number that we get is quite a bit higher and that helps the blood counts get better faster after a transplant; that is a preferable product for autologous transplant. Peripheral blood is really replaced bone marrow for that procedure. Things are a little different in allogenic transplant, because the number of stem cells that we get from the bone marrow or the blood is not the only thing that we have to look at here. For an allogenic transplant, which is really swapping one person's immune system for another, we are transferring a lot of different cells and we are expecting that the donor stem cells are going to basically reconstitute or rebuild that patient's immune system. This is a whole new set of cells, and so the composition of the graft is a little bit different with bone marrow. There are somewhat fewer lymphocytes, cells that can sometimes cause problems in an allogenic transplant, so there are some institutions that may prefer bone marrow. We prefer the blood stem cell grafts for allogenic transplant most of the time. The major difference right now that people see between the two graft products is that the blood counts still recover more quickly in an allogenic transplant using the blood stem cell grafts. This is an advantage that is probably offset a little bit by these other cells and the graft that may cause more problems in terms of immune recovery or graft versus host disease. This is something we haven't even touched on yet, but it is a problem that can complicate things.
- Miller We would like to remind you that you can e-mail your questions to us, and to Dr. Seropian, at [healthline@yale.edu](mailto:healthline@yale.edu). We are going to take a short break to listen to a survivor's story. Please stay

tuned to learn more about stem cells transplant with Dr. Stuart Seropian from the Yale Cancer Center.

### *Survivor's Story*

*A few years ago, the diagnosis of cancer was a death sentence for many patients, but today, thanks to advances in clinical research, we are turning the corner in the battle against cancer. There are over 10 million cancer survivors now living in the US. They are the true heroes in the war against cancer. Here is the story of a hero from Hamden.*

*Ten years ago when I was diagnosed with aplastic anemia, there was no cure. After teaching Math for 35 years, I was forced to retire. Then I met Dr. Tom Duffy at the Yale Cancer Center. He told me about a new procedure called a mini stem cell transplant. He encouraged me to put my life in the hands of Dr. Stuart Seropian, one of the few doctors in the country doing this procedure. On January 17, 2004, I had a stem cell transplant at the Yale Cancer Center. At age 70, I feel like a new man. I owe a great debt of gratitude to the terrific staff at Yale Cancer Center. They literally saved my life. This survivor's story has been brought to you by Yale Cancer Center.*

Miller Welcome back to Healthline. This is Dr. Ken Miller, and I am here with Dr. Chu, and our guest, Dr. Stuart Seropian, who is an expert on stem cell transplant at the Yale Cancer Center. Stuart, when someone receives a bone marrow transplant, does it take place in the operating room?

Seropian That is a good question. I didn't really mention the specifics of how cells are transferred to a patient receiving a bone marrow product or stem cell product. It is really quite similar to getting a blood transfusion; there is no surgery involved. There is no injection into the bone. These are blood cells, and they are pretty smart. They know how to get to the parts of the body that they need to; in particular the bone marrow. We infuse them in the blood stream just like getting a blood transfusion. It may take a little longer than a blood transfusion, but in some cases, when we use peripheral blood for instance, it takes less time because the volume of the product is smaller and the transfusion is usually tolerated like a blood transfusion. The cells make their way to the bone marrow, and it does take some time for the cells to start working; it may take 10 days or 2 weeks, but it is not logistically speaking a complicated procedure in terms of how we transfer the cells to the patient.

Chu Stuart, at the end of the last segment you mentioned one of the potential complications that effects patients who undergo allogenic stem cell transplant, and that is graft-versus-host disease. Could you expand on that for our listeners?

Seropian Graft-versus-host disease is an illness that patients can get after an allogenic transplant if there is any incompatibility between the donor's immune system and the patient's; the way this is manifested is not always the same in patients. A rash for instance might be a minor sign of graft-versus-host disease. More serious signs would be if the bowels are effected and the patients have loose bowel movements, or if the liver is effected. Those are common organs effected. The matching that we do to match the patients and donors gives us good information about the

feasibility of a transplant in terms of making sure the cells will go into the recipient's body and start functioning without being rejected. It is not quite as good at predicting whether or not graft-versus-host disease may occur. There are many genes and proteins in the body that we cannot really test for, that may be minor differences between donors and patient. Graft-versus-host disease is an illness that patients can get and it can be serious. It is one of the things that will sometimes give us pause about doing a transplant. In some ways it can also be a good thing, and one of the major reasons we choose it.

Chu Can you explain why that is?

Seropian When we are trying to decide what kind of transplant a patient might benefit from, we know we can give high dose chemotherapy in either type of procedure, but when we replace the immune system with a donor's immune system, sometimes that immune system may also help fight cancer in the patient. We commonly refer to that as a graft-versus-tumor effect or graft-versus-leukemia effect. Simply put, some of the cells from the donor may be able to kill cancer cells in the patient and that is an advantage that is not present in an autologous transplant because using the patient's own cells, they already have cancer, we know their immune system hasn't been able to fight off the disease. That is a reason why you may choose an allogenic transplant in someone who we think might not be curable otherwise, but we are more likely to see that in patients who get some graft-versus-host disease. So, it is kind of a double-edge sword.

Miller Yale is the only Cancer Center in Connecticut performing allogenic bone marrow transplant. There is also other research that you and your team are doing. Can you tell us a little bit about the research that is being done at Yale?

Seropian One of the biggest changes in the way we do allogenic transplant over the last 10 years is in an area that has been of interest to us in terms of research. We refer to it as reduced intensity or mini transplants. We have had separate protocols looking at this particular type of allogenic transplant; this is a transplant that was born out of a desire to take advantage of the immune effects of transplant or the graft-versus-leukemia effects. There are times when high-dose chemotherapy may not be an important part of the transplant procedure. It is because we don't think it will help the patient as much or because the patient may be older or may have a medical condition. There are ways now with newer drugs, newer chemotherapy drugs or immunosuppressive drugs, that help us do a transplant with less toxicity. We have had programs doing those kinds of transplants for patients who need an unrelated transplant for instance, or for patients who have a matched sibling but are older and have a medical condition; that is one area of research.

The other major research that the Yale program is interested in is trying to find ways to reduce the incidence of graft-versus-host disease, and in particular to try and do that without impacting the immune benefit of transplants. This includes laboratory research that is done by members of our team, and then also some clinical programs looking at new drugs. We have a protocol opening soon for patients that we can only find an unrelated donor, but that unrelated donor isn't fully matched. This can be a more dangerous transplant if we have a donor who is not

fully matched, so we have some new drugs that we are looking at for that. The early results are looking good in terms of preventing serious graft-versus-host disease in those patients.

- Chu Stuart, picking up on what Ken said, we are the only Cancer Center in Connecticut performing allogenic stem transplants, and correct me if I am wrong, we are the only FACT accredited program in the state of Connecticut. Maybe you can explain to our listeners what that means.
- Seropian FACT is an organization that inspects programs and looks at all the policies and procedures that go into making sure that program is collecting cells, is selecting patients, and performing transplants in a safe manner. They accredit programs much in the same way that a lot of the accrediting parties accredit hospitals, in terms of the way the program works from start to finish. They come every couple of years and inspect the blood bank and the pheresis unit where the cells are collected and interview all the members of our team. We are the only FACT accredited program for allogenic transplant in the state.
- Miller If you have further questions about stem cell transplantation, please e-mail us at [healthline@yale.edu](mailto:healthline@yale.edu). You can also go to the Yale Cancer Center website, which is [www.yalecancercenter.org](http://www.yalecancercenter.org), for more information about cancer and the resources available to you. Stuart, any information you would like to share with the listening audience in terms of where the field is heading?
- Seropian Transplant in general is considered by many to be kind of a scary prospect, but that has changed significantly over the last 10 years or so. If people have questions, we are always open to answering them. People send lots of e-mails, and if they are being taking care of by an oncologist from the state, you can ask them to contact us on your behalf.
- Chu The other point to emphasize is that it is important to go to a cancer center such as ours that is accredited for transplantation. Stuart, it has been great having you here on our show. Please join us next week for another program. We will interview another special guest expert. Until then, this is Dr. Ed Chu and Dr. Ken Miller from the Yale Cancer Center wishing you a safe and healthy week.