

Support comes from AstraZeneca, providing important treatment options for women living with advanced ovarian cancer. Learn more at astrazeneca-us.com Welcome to Yale Cancer Answers with doctors Howard Hochster, Anees Chagpar and Steven Gore. I am Bruce Barber. Yale Cancer Answers is our way of providing you with the most up-to-date information on cancer care by welcoming oncologists and specialists, who are on the forefront of the battle to fight cancer. This week it is a conversation about blood donation in support of cancer patients with doctors Edward Snyder and Bernadette West. Dr. Snyder is the Director of the Blood Bank at Yale New Haven Hospital and Professor of Laboratory Medicine, and Dr. West is the Medical Director of the Red Cross for the Connecticut Region. Dr. Hochster is a Professor of Medicine in Medical Oncology at Yale School of Medicine and the Clinical Program Director of Gastrointestinal Cancers Program at Smilow Cancer Hospital.

Hochster The Red Cross is an amazing organization that fulfills so many needs for so many people. Bernadette, can you tell us a little bit how the blood donation program began and the history of the Red Cross.

West Yes, well thank you for having us on. I do agree the Red Cross is a great organization and I am very proud to be part of it. As you know, Clara Barton founded the American Red Cross in 1881 and by 1898, the Connecticut office was established. So originally they did mostly humanitarian work and you know, through World War I and such started providing supplies and clothing, both to people overseas as well as the stateside families and by World War II, the Red Cross began collecting blood plasma to send to troops and hospitals overseas and in 1950, the Red Cross blood program was established to meet the needs of the civilian citizens of Connecticut and Red Cross in that region continues to thrive because of all the generosity of the blood donors who come and literally give out themselves rolling up a sleeve and donating a unit of blood for somebody an adult or a child someone they may never meet.

Hochster And how much of the effort of the Red Cross, today like the American Red Cross is blood banking versus their other services.

West We have a humanitarian division that is very active. I just think Connecticut alone will respond to approximately 800 calls a year for different natural and other types of disasters and then we have a biomedical division, which I am part of, that supplies blood and blood products throughout the entire nation.

Hochster So while we are going to talk more about the blood donation program and how blood products are used tonight, our listeners should remember that the Red Cross is a lot more than that.

West Absolutely, thanks for bringing that up.

Hochster So, how much blood does the Connecticut chapter does process in a year?

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West Well thanks to our generous donors, both financial and then those who give literally off themselves, we are able to collect well over a 100,000 units of red cells every year and many thousands of units of platelets and with this, we are able to meet the vast majority of the blood needs in Connecticut and we are proud to supply and work with world class facilities and programs like the Yale Cancer Center and the Smilow Cancer Hospital in New Haven as well as other excellent hospitals in Connecticut.

Hochster Does the 100,000 units is all stay in Connecticut or does some of it go elsewhere?

West You know, for the most part, the blood remains here because Red Cross has a very robust network throughout the entire nation during times of great need in other areas, we are able to both ship out amounts or receive amounts of blood or blood products as opportunities may arise.

Hochster I see, okay, and so Dr. Snyder is director of the blood bank here at Yale New Haven Hospital. Can you tell us how the safety of the blood is ensured, both for donors and for patients?

Snyder Well the first thing we do is ensure that our suppliers are of the highest quality and the Red Cross certainly is that because having blood is such an important component of making a hospital function properly, we do not have sole source supplier, so we do get a certain percentage of our blood also from the Rhode Island Blood Center in Rhode Island. Both institutions are FDA inspected and are AVB accredited, so we are sure that the highest quality activities are used at those centers. So that is the first thing. The second is that we know the centers take a history on the donors, there is a screening process and then the blood is tested for a whole variety of what we call transfusion transmitted diseases including HIV which is the AIDS virus, another one called HTLV, hepatitis B, hepatitis C, West Nile virus, chagas disease, some parasites like Babesia and also the platelets are tested for bacteria, in addition the syphilis is tested for as well. So these are required tests from the FDA and all the blood units that are transfused at Yale are tested and found negative for these various viruses. It is an ongoing process and every time, another threat to the blood supply appears, there is an evaluation to determine if that needs to be added to the list of tests to make sure that the blood supply is as safe as it can be.

Hochster So I have patients who are little bit reticent to get blood, they are worried about the safety, so how safe is the blood?

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Snyder Blood is extremely safe. The incidents of infections transmitted by blood are in the millions, one in 3 or 4 million for HIV and some of the other viruses as well. The people who lived through the AIDS epidemic still have a fear that the blood would be infected. Those who have not lived through the AIDS epidemic, younger generations, are less concerned, but the Red Cross and the

Rhode Island Blood Center and the FDA are all still very attentive to these viruses, would be probably doing these testings for the foreseeable future even though there are other ways blood can be processed which we may talk about later so-called pathogen reduction which we are using now at Yale, there is still a concern, but it is essentially minimal and although blood is as safe as it can be, we only use it when absolutely needed and only when it is indicated and we use the least amount that we need to. We are very respectful of the benefit of blood and also the fact that it is a human product and one has to be careful in prescribing it.

Hochster So Dr. West, what do you do to ensure the safety when you collect the blood?

West Well, the safety measures take place before the collection even starts and the donor has to be certain age and in the State of Connecticut, you have to be 17 years or older, you have to weigh at least 110 pounds and you have to be in generally good health to be able to donate and we start with some predonation materials that you will read through to read about risk factors that you may have that you did not realize or medications that you might be taking that would interfere with the quality of the blood that you are about to give and then the next portion is that you would do a health history questionnaire that asks rather personal questions about your health history, lifestyle, and travel to make sure that we can do our very best to screen donors before they are actually even drawn. Additionally, we do a mini health physical which is your height and weight, blood pressure and pulse, and if you meet all those criteria, if you are going whole blood, we will just take a little fingerstick to make sure you are healthy enough to donate and then you are able to donate.

Hochster So people who would like to donate should be generally more than 110 pounds, more than 17 years old, and generally in good health?

West Yes.

Hochster And the travel thing could be something that causes you to ask them not to donate at that time?

West Possibly, you know, depending on where they have traveled, for example, if it is to a malaria endemic area, they would be deferred for a short period of time and so on.

Hochster Anyway other people who are generally healthy even if they are taking some common blood pressure medications, they could give?

West Absolutely, they would be able to donate.

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Hochster So that is kind of the first step to screen out people who may be more at risk because of certain factors?

West Next portion would be during the donation, we take some additional tubes of blood to send off for testing for all the tests that Dr. Snyder mentioned and we keep the blood and do not release it until we receive all the results of the testing and only when all the testing results are negative, are we able to supply that blood to somebody.

Snyder I think it is important to point out a little bit emphasizing what Dr. West just said, that the Red Cross and the other blood centers are not only interested in the health of the recipient getting the best blood but also the health of the donor, so the donor safety is just as important as is recipient safety.

Hochster That is a very good point and I think people would be reassured by that. What do you do to actually process the blood?

Snyder Well, we get a request from a physician or a licensed independent practitioner that is able to request blood for a patient that may need blood and the different types of blood, there are red blood cells, which carry oxygen, there is plasma which has clotting factors, there are platelets which are little pieces of a larger cell called the megakaryocyte which break up normally and they help the blood clot, those are the 3 different types, they are all stored differently, they all have different shelf lives and we have different amounts of them. We have about 400 units of blood on the shelf of all the various types, A, B, O, AB, Rh positive, Rh negative, and listeners may remember that those who are not in the field of medicine from high school biology where they talked about the different blood types. We have, for example at any one time 150 or more units of O on the shelf and we do talk about universal donor and universal recipient, but primarily we try to give the same blood type to the patient as is the unit of blood being given. The physician requests the blood and we take a sample of the blood for red blood cells and we add it to a sample of the patient's blood, mix them together in a sense in a test tube or now we are using a much more sophisticated machine to see if in the laboratory the red cells and the plasma from the donor blood and the patient are compatible; if they are, then it can be transfused; if there is an incompatibility which we can detect, the blood is not used and we have to look further to see if the patient may have developed some proteins due to prior transfusions or in women due to prior pregnancies, which would cause the blood to be incompatible.

Hochster That's what they call a cross match.

Snyder That is a cross-match and that is what the blood bank technologists and the blood bank staff do to make sure that the patient receives not only the safest blood, but that is properly matched for the right patient.

Hochster And how long does that take to do?

Snyder Well there is a screening process which is what we focus on primarily, it takes about 45 minutes to an hour. In an emergency, the blood can be given out just based on the ABO type which is one of the main blood group antigens we worry about, but normally it takes about 45 minutes.

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Hochster I see and so if I go to the Red Cross and I donate a unit of blood, however much they take, it is going to land up turning into packed red blood cells, plasma, and platelets?

Snyder It can, it depends the fractionation of blood or the dividing of the components into different parts is very important and the Red Cross knows how to do this, so if we need more plasma, they will direct some of the whole blood into plasma, as well as platelets and red cells. There are machines that can collect just platelets or just plasma or just red cells. It is a business, and it is very sophisticated and each unit of whole blood is usually divided into about 2-3 components each as needed and the Red Cross Blood Center manages that quite well.

Hochster It is good know that our blood donations go to so many purposes. We are going to take a short break for medical minute. Please stay tuned to learn more information about blood donation and the American Red Cross.

Medical Minute Support comes from AstraZeneca, created 3 new FDA-approved cancer therapies in the past 3 years and on track to provide patients with 6 new medicines by 2020. Learn more at astrazeneca-us.com. There are many obstacles to face when quitting smoking as smoking involves the potent drug nicotine, but it is a very important lifestyle change, especially for patients undergoing cancer treatment. Quitting smoking has been shown to positively impact response to treatments, decrease the likelihood that the patients will develop second malignancies and increase rates of survival. Tobacco treatment programs are currently being offered at federally designated comprehensive cancer centers such as Yale Cancer Center and at Smilow Cancer Hospital. Smilow Cancer Hospital's tobacco treatment program operates on the principles of the US Public Health Service Clinical Practice Guidelines. All treatment components are evidence based and therefore, all patients are treated with FDA-approved first line medications for smoking cessation as well as smoking cessation counseling that stresses appropriate coping skills. More information is available at YaleCancer-Center.org. You are listening to WNPR, Connecticut's public media source for news and ideas.

Hochster Welcome back to Yale Cancer Answers. This is Dr. Howard Hochster and my guests tonight, Dr. Edward Snyder and Dr. Bernadette West join me to discuss blood donation in honor of cancer patients. So we are talking about the different kinds of blood product and donation. When people think about blood donation, it often really comes to their mind and at time of crisis, when there is natural disaster or perhaps mass casualty event and that is when people really think about blood donation. Can you kind of tell us like what the ongoing need is and you know what happens when we have these kinds of events where there are so many donors?

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Snyder Yes, managing crisis and natural disasters and mass casualties is difficult. As I mentioned in the earlier section, we have about 150 units of type O on the shelf and about 300 of the other types mixed in. If there is a disaster or there is a mass shooting, those units can go very quickly and we turn to our blood center, the Red Cross and Rhode Island Blood Center as needed to help support that. Part of the problem is having enough blood not only for the actually casualty and the victims on that day but going forward and as I mentioned the certain blood products like platelets have a 5-day shelf life which means if 500 people show up to donate blood because they want to help and this is their expression of how they can help the victims and platelets are taken, 5 days later, all those platelets have expired if they have not been used, so the trick is to spread out the donations, so that we can help the victims of that day and also going forward have enough blood for those individuals as they are healing and actually, Dr. West can explain a little better how the Red Cross manages something like that.

West Yes, thank you Dr. Snyder. You are correct and that the blood supply is constantly in flux and we try to avoid collecting huge amounts at once following natural disaster or some other sort of incident like that because of the expiration dates. So red cells can be stored up to 42 days, plasma can be used rather soon after or be frozen for years, but the platelets do only stay on the shelf for 5 days and will all the testing that we do, it takes almost 3 days for all the testing results to come back, so you can see what a tiny window remaining for platelets that we have, just about 2 to 2-1/2 days, so one way to help avoid this is to make appointments and we think we do a pretty good job of trying to get people in at regular intervals, but also keep the blood supply as even as possible by setting these appointments ahead of time, so if you are a regular blood donor out there listening you know what I am talking about and if you are someone who is thinking about donating, I would encourage you to look online at redcross.org and make an appointment. Hochster So if there is another major hurricane or some natural disaster, you may be asking people to wait a few days or a week to donate?

West Yes and we hope that they understand it is not that we do not appreciate their generosity, it is just making the best use of very precious product.

Hochster Well that makes complete sense and what about the ongoing kind of daily use, you know, we are talking about cancer patients here to a certain extent, what is the ongoing need around Connecticut for kind of daily use of blood for medical purposes or surgical purposes?

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West We send blood out daily many times a day to numerous hospitals across the state and you know, red cells are constantly being used to help patients with sickle cell for example who rely on blood transfusions throughout their entire life, for trauma patients who have been in car accidents, for patients who have

undergone a liver transplant or something like that and we provide blood for transfusion for every size of patient and I know Dr. Snyder can speak to this well from the smallest premature baby to even intrauterine transfusions which are transfusions to fetuses who are still in their mother's womb to adults and they rely on us everyday and a single transfusion can literally be life saving for these people.

Hochster Can you give us an idea of about how many units of red cells are used in Connecticut on a daily basis?

Snyder Hard to say.

Hochster Okay.

Snyder Well in our hospital, at Smilow, for the cancer patients as well as for the rest of the patient population, we get about 50-60 units of red cells a day and for platelets, we get about 20-30, we get about 25-30 or more plasma units and the Red Cross is available to supplement those shipments. This is 7 days a week. The reason patients with cancer need blood so much is that one way to treat cancer patients is to use chemotherapy, another is radiation therapy and if those treatments suppress the part of the body that produces red blood cells, mainly the bone marrow, the patient may become anemic or his platelet count will drop and they have to be replaced and the cell survive a short period of time, so you may need to transfuse again further until the patient's bone marrow recovers or until the patient has stopped the chemotherapy treatments and is getting better on their own. So we may go from, you know, needing 50-60 units of platelets a day to over a 100 if somebody in the operating room for example is bleeding excessively or there is a mass casualty, we work very closely with the blood center and that is the other reason, we have more than 1 supplier for something as important as blood. Red Cross is our main supplier, but sometimes I mean we realize there are other hospitals in the state that need blood as well. So we try to manage the inventory and we are talking to the Red Cross, I would say 5 or 6 times a day.

Hochster So the physicians are concerned about the people who have anemia, most of the people who are listening think of anemia as being you are lacking something, but in this case it is really under production kind of anemia due to treatment and so we are just giving iron or B12 would not really help, we need to really replace the red blood cells and sometimes the platelets too.

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Snyder Exactly. The red cells take about 7-10 days for red cells to be formed. Giving someone iron if they need it is like you know providing one of the building blocks, but you really need something acutely right away and that is where the transfusions are used or platelets if it is a low platelet count. As you had mentioned the decrease in production causes a need. There are some illnesses that are seen in patients with cancer, DIC is the abbreviation that stands for

disseminated intravascular coagulation which is really the clotting that is occurring inside the body and the blood in the body is not supposed to clot. It clots if you cut your hand or when you get a little cut on your skin, it should clot there, but you should not have clotting occurring in the blood vessels, that is a big, big problem if it occurs and we may need to use platelets as well as red cells and clotting factors as well. So we have 3 physicians in the blood bank at any one time to test in the use of the blood products and discussing with the clinicians and the oncologists what type of blood is used and what is the best one to use for a particular patient.

Hochster Yeah, I can tell you from personal experience that they are an amazing resource and really helpful to the clinicians that people do not have everywhere that kind of resource, so that is a great thing. Is there a more critical need for certain types of blood?

Snyder Well, there is a need any type of blood. It can be used regardless of blood type. The types that are generally more sent out for appeal are type O blood because it can be given to people of other blood types and we do not want anyone who is type A or type B to think that the blood is not needed, we need all blood of all types and we rely on the Red Cross to structure their drives to perhaps target sometimes or make appeals as different types are needed, but all blood that is accepted and collected is what we would like to have.

Hochster Dr. West, do you have any, you know, methods for searching out certain kinds of blood types and so forth at the Red Cross?

West Yes, we have large databases of person's blood types throughout the Red Cross and in addition to our region, so if Dr. Snyder or one of our colleagues throughout the state should need a very particular rare phenotype of blood, we are also able to get something for them.

Hochster And there are some people registered with you?

West That is correct.

Hochster So that is a great thing for people who are interested in this to know that if they have some unique type that they can really be someone who could be called on in the time of urgent need and that would be helpful in that situation. I mean it is really critical sometimes for patients I can tell you and we really appreciate the work that the Red Cross and the donor's willingness to give in those times when you really kind of your back is up against the wall and you need something.

West That is correct, thank you.

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Hochster During the holiday season now, donating blood is another way to give back to others. What exactly should people do if they are interested, Dr. West?

West Well if you are interested in donating, I would encourage you to go to your mobile device or your internet browser and put in redcross.org and you will get a page that comes up and if you put your zip code in that bar there, it will find you a list of drives near to you as well as a map of where they are and you can do this whether you live in the state of Connecticut or wherever you are in the US, and we also have another tool called Rapid pass, and if you use Rapid pass, you are able to answer some of the health history questions beforehand and read through the educational materials and it takes about 10-15 minutes and it will save you a lot of time. Again, I encourage you to make an appointment prior to coming up because even though we staff our drives very adequately, it can be difficult to accommodate a number of walk-in suddenly and we definitely do not want to discourage you from donation, but we want to be sure to have a spot for you when you donate and remember to eat well and to hydrate really well prior to donating, because we want you to replenishing those fluids even before you donate. Following donating, we watch you a little while longer, give you some snacks and juice to make sure you feel your best before we send you back out on your way.

Hochster Are there places for people to donate outside of the blood drives or is everything at a blood drive?

West Oh no, you are correct. There are what we call our fix sites or the Red Cross buildings that you see here and there and you can donate in those centers or you can also donate at what we call mobile blood drives where we are usually sponsored by another organization or an even and we come there and set up our drive, so you can donate it either type of site.

Dr. Bernadette West is the Medical Director of the Red Cross for the Connecticut Region and Dr. Edward Snyder is the Director of the Blood Bank at Yale New Haven Hospital and Professor of Laboratory Medicine at Yale School of Medicine. If you have questions, the address is canceranswers@yale.edu and past editions of the program are available in audio and written form at Yale-CancerCenter.org. I am Bruce Barber reminding you to tune in each week to learn more about the fight against cancer. You are on WNPR, Connecticut's public media source for news and ideas.