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Welcome to Yale Cancer Answers with your host doctor Anees Chagpar.

Yale Cancer Answers features the latest information on cancer care by welcoming oncologists and specialists who are on the forefront of the battle to fight cancer.

This week it’s a conversation about the care of adolescents and young adults with sickle cell disease with Doctor Cece Calhoun.

Dr Calhoun is an assistant professor of medicine and hematology and assistant professor of Pediatrics in hematology oncology at the Yale School of Medicine, where Doctor Chagpar is a professor of surgical oncology.

Cece, maybe we could start off by you telling us a little bit about yourself and what you do.

I like to call myself a lifespan hematologist, and both my clinical and research interests center around the care of young adults with sickle cell disease as they transition from pediatric to adult care.

We know it’s a really high risk time for them. And so all the work that I do both in the clinic and in the research setting is about making that process better.
Is sickle cell disease a cancer?

Tell us more about what exactly sickle cell disease is and why it’s being seen by an oncologist?

That’s a great question, so actually sickle cell disease is an inherited condition of the red blood cells and so many people are familiar with anemia and conditions of that sort, which affect red blood cells and hemoglobin.

And that’s what sickle cell disease is a condition of, and it’s genetic. So patients are born with it, and when you have sickle cell disease because of a genetic mutation your red blood cells are not squishy and malleable, they can be really stiff and misshapen like a sickle. They can be shaped like a sickle or a banana, and so if you think of your blood cells as pipes imagine if you had your Jelly doughnuts kind of going through those pipes, bouncing off the walls,
taking oxygen to where it needs to go, and you replace those cells with sticky stuff, fragile misshapen red blood cells like sickle cells that are scratching up the red blood vessels sticking together, causing blockages, impeding flow, and then you can imagine all the complications that patients with sickle cell face. Most saliently or what patients have to really deal with is a lot of pain. That’s the thing that brings them to the hospital. And acute meaning an unplanned basis, any part of our body where there are blood vessels, those misshapen cells can get clogged up in those blood vessels and cause problems. It’s important for patients with sickle cell disease to have regular care by an oncologist who also understands hematology, the blood, to make sure that all their organs are in tip top condition and that we treat anything before there’s a problem. Now, I would think that if you’re a pediatric patient and this is an inherited condition,
you might have a sense of whether or not you have sickle cell disease based on whether your parents did. But somebody had to start with the genetic mutation to begin with. So how many of your patients actually know that they have sickle cell disease from the time that they were born and how many of them present to you acutely? In the United States we have the benefit of the newborn screen that all babies born in hospitals, when they get their heel poked and get that little spot of blood that can test for a variety of genetic conditions and sickle cell disease is included in those conditions. So if a child has an abnormal newborn screen, oftentimes the pediatrician will refer them to a hematologist for further evaluation and work up. And sometimes, even if it’s abnormal to show sickle cell trait, which means that you don’t have the disease, but you can be a carrier, and if your partner has the disease, you can have a child with sickle cell disease. We can figure that out from
the newborn screen. So these days we know pretty early on which is critical to the survival of our young children or infants and toddlers and in other countries the newborn screen isn’t quite as universal, and so sometimes children could present with swelling of the hands and feet. That’s something called dactylitis, which is pretty rare these days as a presenting sign. And then there’s some patients with more milder forms of sickle cell disease that don’t know until they’re older children or young adults, but most of the time we get them in our catchment when they are young because of their newborn screen and can really wrap our arms around them and give them the care they need. Let’s suppose you’re a newborn baby and you had your heel poked and they tell you that you have sickle cell disease. Well, presumably they don’t tell you they tell your parents and you get referred to a pediatric oncologist. If that means that your red blood cells are now more like bananas than squishy Donuts, what can you do about that?

I mean, is it reversible?
At this time the only cure for sickle cell disease or way to reverse those cells is by replacing your bone marrow with another persons, but that’s pretty rare. Later in the show, you get to talk a little bit more about therapies coming down the pipeline for patients, but right now that’s the only way to reverse. However, if you are a little baby and your parents find out that you have sickle cell disease the benefit of coming and talking to a pediatric oncologist and hematologist who knows about this is that you now have a team member, somebody on your team that can help your baby, or you if you’re the baby, stay healthy and safe. And what that looks like as a toddler is getting them started on penicillin prophylactically or in advance before there’s any problems because we found that as recently as the late 70s, there was kind of a peak in infancy and toddlerhood of death, because patients with sickle cell were getting really bad infections,
but we found that if we vaccinate them and give them prophylactic penicillin, they live well into adulthood. The challenge becomes, how do we help them when they go from infant to adults? So just to back up a little bit when you say prophylactic penicillin, do you mean like every day for the first five years of their life? So definitely every day for the first five years of their life. But what it does is it protects them against really bad infections like pneumococcus you know patients with sickle cell disease, their spleen doesn’t really work as well as somebody without sickle cell and because of that they are susceptible to certain types of infections and that penicillin every day just like a vitamin helps them to stay healthy and safe. So why is there this transition then from childhood to young adulthood? What’s the difference in terms of the disease and how it’s managed that requires a specialist like you? Well, I think it’s a variety of things. It’s not just the disease,
but it’s becoming a young person and learning how to navigate the health care system on your own and earlier we talked about newborns and if you were a newborn and found out you had sickle cell disease that your parents would help you take you to the doctor. Manage your care, give you that prophylactic penicillin. But the beautiful part about being a young adult is you can start to assume some of that care for yourself, so it’s pretty multi factorial is a word I always like to use and I like to think that I was a pretty smart young adult like I made some good decisions. I’m a doctor now, but I still did some foolish things as a 16-17 eighteen year old and that’s without a chronic disease. So in sickle cell disease, what we can do as lifespan hematologists and as health care providers is really help our patients as their disease complications may become a little more severe as they’re learning to manage themselves. As they’re learning to navigate a pretty complex health care system,
and as they’re just trying to be productive, happy young adults. What kinds of things do you talk about with your patients? It sounds like after their five years old, they’re no longer on penicillin, but there’s still no way to reverse the condition, so you’re still at risk of all of those sticky, misshapen blood cells forming clots all over your body, which presumably can cause all kinds of problems. Is it just a matter of telling your patients what to watch for and when to seek help? Or are there things that they can do to reduce the risk of clots and other problems that it can cause? Absolutely, so I want to answer your question in two parts. First, what other parts of the body does sickle cell affect? How does that show up for patients across their lives? One of the things that our patients most deal with is pain every single day. So when those blood vessels get clogged up by those sickle cells and those juicy Jelly doughnut cells can’t get through,
that means oxygen isn’t going to where it needs to in our bodies. And because of that, that can result in pretty bad bone pain for patients with sickle cell disease, and this is the thing that really affects their quality of life as young students trying to learn and keep up in school. If you have to be admitted to the hospital several times a year you can imagine how frustrating that can be as a scholar. Other parts of the body that are affected by sickle cell disease are numerous. Though patients with sickle cell disease can have something called acute chest syndrome, which is a really bad infection of the lungs that can be very challenging, they can even have strokes as young people, which is one of the reasons that compelled me as a Med student to pursue hematology was seeing a sickle cell patient eight years old who had a stroke in Pediatrics. And in order to kind of get a jump on these things, we do several things, we do screenings. Something called a transcranial Doppler, which is basically like an ultrasound
of your head where you can look at the blood vessels and make sure you’re not at risk for having a stroke. We always make sure that our patients have their eyes checked because sometimes in sickle cell disease you can have vision changes and a regular follow up with a hematologist can help you notice any changes before they cause problems. One of the biggest things and one of the things we know works and helps prolong life in sickle cell patients is a use of a medication called Hydroxyurea. Now, some of your listeners may be familiar because sometimes this can be used in patients who have certain cancer diagnosis, but in sickle cell disease, the dose that we use is much lower and the way that we use it as a bit different. And we know that it kind of helps you have more juicy fat cells than bananas and so your body overall does better in the long term. So just to follow up on a few things that you just said. First off taking that last comment about Hydroxyurea making you have more fat and juicy like blood cells rather than sickling bananas,
0:11:54.62 → 0:11:57.154 is it true that if you
0:11:57.154 → 0:11:59.02 have sickle cell disease,
0:11:59.02 → 0:12:01.106 not all of your blood cells are
0:12:01.106 → 0:12:03.194 bananas and it is possible to
0:12:03.194 → 0:12:05.45 increase the number of Jelly doughnut
0:12:05.45 → 0:12:07.766 blood cells that you have instead
0:12:07.766 → 0:12:09.641 of bananas?
0:12:10.66 → 0:12:13.985 Absolutely, and that is up until
0:12:13.985 → 0:12:16.095 recently, the only FDA
0:12:16.095 → 0:12:18.104 approved medication that we have had
0:12:18.104 → 0:12:19.958 for our patients is Hydroxyurea
0:12:19.96 → 0:12:22.84 to increase the amount of non sickle cells,
0:12:22.84 → 0:12:25.492 Jelly doughnut cells and ensure that
0:12:25.492 → 0:12:27.663 you’re pain complications are lower
0:12:27.663 → 0:12:30.029 and that your organs can really get
0:12:30.029 → 0:12:32.07 the oxygen they need to thrive.
0:12:32.6 → 0:12:34.712 So an obvious question is why
0:12:34.712 → 0:12:36.766 not use more and make
0:12:36.766 → 0:12:39.059 all of your blood cells Jelly Donuts?
0:12:39.06 → 0:12:40.568 But hold that thought.
0:12:40.568 → 0:12:43.681 Because first we need to take a short
0:12:43.681 → 0:12:46.211 break for medical minute. Stay tuned
0:12:46.211 → 0:12:48.173 to learn more about adolescents and
0:12:48.173 → 0:12:50.165 young adults with sickle cell disease
0:12:50.165 → 0:12:52.3 with my guest doctor CeCe Calhoun.
0:12:52.79 → 0:12:54.92 Funding for Yale Cancer Answers
0:12:54.92 → 0:12:57.05 comes from Smilow Cancer Hospital.
0:12:57.05 → 0:12:59.558 Fifteen care centers offer access to
0:12:59.558 → 0:13:01.23 oncologists committed to providing
0:13:01.293 → 0:13:03.645 patients with cancer and blood diseases.
0:13:03.65 → 0:13:05.51 Individualized innovative care.
Find us. Milo Care Center near you at yalecancercenter.org.

There are over 16.9 million cancer survivors in the US and over 240,000 here in Connecticut. Completing treatment for cancer is a very exciting milestone, but cancer and its treatment can be a life changing experience.

The return to normal activities in relationships may be difficult and cancer survivors may face other long term side effects of cancer, including heart problems, osteoporosis, fertility issues and an increased risk of second cancers. Resources for cancer survivors are available at federally designated Comprehensive cancer centers such as the Yale Cancer Center and at Smilow Cancer Hospital to keep cancer survivors well and focused on healthy living.

The Smilow Cancer Hospital Survivorship Clinic focuses on providing guidance and direction to empower survivors to take steps to maximize their health, quality of life and longevity.

More information is available at yalecancercenter.org. You’re
listening to Connecticut Public Radio. Welcome back to Yale Cancer Answers. This is Doctor Anees Chagpar and I’m joined tonight by my guest Dr. Cece Calhoun. We’re talking about the care of adolescents and young adults with sickle cell disease and bright before the break CeCe was mentioning that while sickle cell disease is completely irreversible, that actually using a drug called Hydroxyurea can help your body to create more of these quote juicy cells which are normal red blood cells and less of these quote banana like cells which are the sickle cells. So my question to you was before we had the break, is why not just give more Hydroxyurea? I mean if it helps your body to produce more normal cells and less sickle cells, wouldn’t that be a way to kind of reverse it? I would love if it could be totally reversed by Hydroxyurea but we know that when our patients are awesome, take their medications every day as prescribed, there’s still an upper limit to how many of those juicy fat
cells they can replace. They can produce to replace the banana cells, so there’s a threshold of how effective the drug can be, but it can really help enough to help your organs stay healthy.

So this Hydroxyurea is something that you’re taking every day? For your whole life?

And the other thing that you mentioned before the break was this concept of pain and the fact that many of these patients they present with pain and they have pain every day which impairs their ability to concentrate at school or maybe place boards.

Mean, are these patients treated with daily painkillers? Or do you tell them to simply wait until they have pain and then prescribe pain medication?

Mean how do they get through their day to day life if they’re in pain everyday? Yeah, so sickle cell patients are warriors and you’ll often see that described because despite having pain of variable severity, they managed to live life and be productive.

That’s one of the most awesome things
0:16:50.498 –> 0:16:52.81 about working with sickle cell patients.
0:16:52.81 –> 0:16:55.06 So in terms of pain prevention,
0:16:55.06 –> 0:16:56.28 what can we do?
0:16:56.28 –> 0:16:58.506 Number one Hydroxyurea and get more juicy
0:16:58.506 –> 0:17:00.788 cells around so you have less pain.
0:17:00.79 –> 0:17:03.13 And recently there are a couple
0:17:03.13 –> 0:17:05.23 of medications on the market
0:17:05.23 –> 0:17:07.56 that help with pain prevention.
0:17:07.56 –> 0:17:10.518 Also just keeping yourself well hydrated.
0:17:10.52 –> 0:17:12.308 My patients are so wonderful in
0:17:12.308 –> 0:17:14.289 that they often know their bodies.
0:17:14.29 –> 0:17:15.214 They know their triggers.
0:17:15.91 –> 0:17:18.276 And what situations make their pain worse.
0:17:18.28 –> 0:17:19.468 And what kind of things can
0:17:19.468 –> 0:17:20.26 make their pain better.
0:17:20.26 –> 0:17:22.808 So really being attuned to those things
0:17:22.81 –> 0:17:25.156 in terms of addressing pain acutely
0:17:25.156 –> 0:17:28.008 when it happens and it’s not planned,
0:17:28.01 –> 0:17:31.916 we have a couple of things in our toolkit.
0:17:31.92 –> 0:17:33.9 Yes, pain medication is something
0:17:33.9 –> 0:17:36.53 that we give frequently for pain,
0:17:36.53 –> 0:17:38.658 but we can also use red
0:17:38.658 –> 0:17:40.858 blood cell transfusions if we need to.
0:17:40.86 –> 0:17:43.116 If somebody is having pain often,
0:17:43.12 –> 0:17:46.126 but many times we can’t predict
0:17:46.13 –> 0:17:47.35 when the pain will come,
0:17:47.35 –> 0:17:49.246 or how severe it will be,
0:17:49.25 –> 0:17:51 and so because of that our patients
0:17:51 –> 0:17:53.16 have to get care in the ED sometimes
0:17:53.16 –> 0:17:54.84 to get treatment for their pain.
0:17:55.55 –> 0:17:57.06 You mentioned something
that I found kind of intriguing.
You said that we have medications
for pain prevention, like what?
Hot off the press I know,
so recently there’s been
an FDA approved medication,
Adakveo or crizanlizumab
but I try not to say
that because crizanlizumab,
but that can be used to prevent pain
as an infusion given once monthly.
And another medication that’s recently been
approved is something called Oxbryta
and really, what that does is increase
patients with sickle cell disease,
their hemoglobin,
and so the thought is if their
hemoglobin is better they
may in turn have less pain,
but the primary medication that
is out there for pain
prevention is Adakveo.
That sounds like a
pretty good deal, right?
If instead of having pain everyday,
if you had an infusion once a month,
does that infusion kind of really get
rid of the chances of having pain?
Or not really?
I think that the medication is pretty
new and patients themselves are
are individuals, and so I’ve had some patients who it’s worked great for. I’ve had some patients that we just have to try other things. I think the wonderful thing about being a physician scientist and sickle cell, or even being a patient right now who has sickle cell is that it is such a fertile time for discovery. In terms of sickle cell disease, how to prevent complications and how to cure it. So you just have to work with your hematologist to find the right regimen for you. So I want to pick up on that discovery and some of the new advances that are going on in terms of sickle cell research. But before that I had one other question about the complications you had mentioned before the break. One of the impetuses for you to become a pediatric climatologist was an 8 year old who had a stroke which just I mean is heartbreaking to me. But clearly if you think about these sickle cells, it makes sense, right? These sickle cells kind of glom
0:20:18.73 -> 0:20:20.122 together and they cut off blood
0:20:20.122 -> 0:20:21.909 supply to a part of your brain
0:20:21.909 -> 0:20:22.985 that’s called the stroke.
0:20:22.99 -> 0:20:25.258 Now when we think about
0:20:25.258 -> 0:20:26.837 older patients who
0:20:26.837 -> 0:20:29.308 may be at risk of stroke or who may
0:20:29.308 -> 0:20:31.316 be at risk of heart attack or who
0:20:31.316 -> 0:20:33.028 may be at risk of other clotting,
0:20:33.03 -> 0:20:35.082 whether it’s in their lungs or
0:20:35.082 -> 0:20:37.18 in their legs or whatever,
0:20:37.18 -> 0:20:39.6 we often use blood thinners,
0:20:39.6 -> 0:20:41.64 so are sickle cell patients put
0:20:41.64 -> 0:20:44.006 on blood thinners to
0:20:44.006 -> 0:20:45.416 prevent these complications?
0:20:45.42 -> 0:20:46.765 Since we know that they’re
0:20:46.765 -> 0:20:48.11 at risk of getting clots.
0:20:48.33 -> 0:20:51.151 So the blockages that occur in sickle
0:20:51.151 -> 0:20:54.031 cell disease are a little bit different
0:20:54.031 -> 0:20:56.97 than your normal blood clot, which is
0:20:56.97 -> 0:20:59.96 caused by a different series of events,
0:20:59.96 -> 0:21:02.2 and so for patients with sickle cell disease,
0:21:02.2 -> 0:21:03.574 though they are at an increased
0:21:03.574 -> 0:21:04.9 risk to have those
0:21:04.9 -> 0:21:07.196 traditionally, what we think of blood clots,
0:21:07.2 -> 0:21:09.16 we don’t put them on blood thinners
0:21:09.16 -> 0:21:11.038 to try to prevent complications
0:21:11.038 -> 0:21:12.986 with sickle cell disease.
0:21:12.99 -> 0:21:14.803 We know those blockages can be stuck
0:21:14.803 -> 0:21:16.73 like a clot, or they can be transient,
0:21:16.73 -> 0:21:18.15 they come and go because of the
It’s not like the other proteins in your body are swimming over there, making a huge clot. What we do in our young people to maximize stroke prevention is we do screenings like the Transcranial Doppler I mentioned. And if we notice any kind of abnormality at all, we have a couple of options. One we can start them on chronic transfusion to decrease the amount of sickle cells circulating in their blood and give them more normal cells. Or if somebody has been on transfusions, their transcranial dopplers looks fine, we can switch them to again Hydroxyurea put more Jelly Donuts around, have less sickle cells, decrease the risk of complications, and that’s again why it’s important to connect with your friendly hematologist so we can help you on that journey. Yeah, but presumably you would have already been on the Hydroxyurea so if that transcranial Doppler finds that you’re at increased risk I guess the transfusion is your only alternative,
but the issue there is if you keep getting transfusions on a regular basis, doesn’t that increase your risk of transfusion reactions and potentially ultimately developing antibodies such that there are fewer and fewer blood types that you can actually take? Absolutely. For patients who have chronic transfusions, they’re a variety of risks that come along with that. There’s obviously a clear benefit in that it keeps you safe and protects you against stroke and may decrease your pain. But you’re absolutely right, our bodies recognize things that aren’t foreign, and that’s why we really work in tandem and together with our transfusion medicine colleagues to do extended typing in patients with sickle cell disease to prevent that risk of developing antibodies. Another big risk is something called iron overload, where excess iron from the blood deposits in different organs like your liver, your heart, or your eyes. So we measure that regularly and again, medicine is so cool because we’re
always ideally moving forward and there’s also a procedure called Erythrocytosis which I don’t too much mind saying five times fast, but I like it, which can help decrease that risk of iron overload. Let’s talk a little bit about some of the exciting advances in terms of sickle cell disease. Tell us about what you think are the most exciting things that are really going to make a difference for your patients. I think there are a lot of medications in the works to address pain and complications of sickle cell disease. But one of the things I think that is most exciting is the idea of a cure through gene therapy, and that’s pretty awesome. There’s been some media, the New York Times has published about it and the Washington Post as well about how we can use different scientific technologies like CRISPR technology or use different vectors like viral vectors to take somebody’s stem cells and correct that defect in their DNA that caused them to be making sickle cells and then
give it back to them in a safe way, and then when those new and improved cells from their bodies replicate they are no longer affected by sickle cell disease. They may still make some sickle cells, but will effectively be cured or be like somebody who just has the trait and that’s one of the things I think that’s most exciting. The possibility of a cure in our future. And is that 10-15, 30-50 years from now? No, the time is totally now, so there are clinical, active clinical trials going on to better understand the safety and efficacy of this process for patients and so that’s happening now. Wow, that’s super exciting. What else is going on? So I think the other main things are the development of oral medications to improve pain and to decrease complications from sickle cell disease. That one medication, Adakveo, the way that it works, it’s something called a B selection inhibitor.
And so they’re more medications coming around that look at that. And there’s some additional oral medications coming that target different mechanisms and other blood problems like thalassemia and they want to see if those medications can work well in patients with sickle cell disease. So I think that fact that we are shining a light on this community of people with sickle cell disease and that we as a scientific community have committed to making their quality of life better, that’s the thing that’s most exciting to me, because oftentimes I think my patients feel unseen and unheard, and so it’s great to see so many people, brilliant people standing up for them and helping to make their lives better. That’s awesome.

I guess the last question that I have is really with regards to clinical trials. It sounds like there’s so many great things on the horizon. Do you find that young people adolescents are interested in clinical trials and willing to participate? Are there barriers to participation? How has that been going along?
0:27:14.58 -> 0:27:16.93 with sickle cell or chronic pain,
0:27:16.93 -> 0:27:18.755 I think is enthusiastic about
0:27:18.755 -> 0:27:21.229 finding a way to have a better
0:27:21.229 -> 0:27:23.338 life and to come have a better
0:27:23.338 -> 0:27:25.961 quality of life and to find a cure.
0:27:25.961 -> 0:27:27.995 When it comes to clinical trials,
0:27:28 -> 0:27:31.704 there's a careful balance
0:27:31.704 -> 0:27:33.911 between understanding clinical
0:27:33.911 -> 0:27:36.368 studies and not wanting to feel like
0:27:36.368 -> 0:27:37.852 an experiment and understanding
0:27:37.852 -> 0:27:39.994 how the medical system can wrap
0:27:39.994 -> 0:27:41.788 around you to keep you safe.
0:27:41.79 -> 0:27:43.81 As we understand more about
0:27:43.81 -> 0:27:46.51 how to help you have a cure.
0:27:46.51 -> 0:27:49.429 And so when I think about
0:27:49.43 -> 0:27:50.45 my young people,
0:27:50.45 -> 0:27:52.49 are they interested in clinical trials?
0:27:52.49 -> 0:27:55.316 I think that they have a lot of excellent
0:27:55.316 -> 0:27:57.294 questions about the benefits and
0:27:57.294 -> 0:27:59.694 risks of participating in clinical trials.
0:27:59.7 -> 0:28:01.34 But many of them ultimately,
0:28:01.34 -> 0:28:04.175 when we sit and talk and take the time,
0:28:04.18 -> 0:28:05.902 they understand that it is their
0:28:05.902 -> 0:28:07.759 contribution to not only their health,
0:28:07.76 -> 0:28:09.769 but the community of sickle cell patients.
0:28:09.77 -> 0:28:11.653 And that's the beauty of having providers
0:28:11.653 -> 0:28:13.7 that have known you through the lifespan.
0:28:13.7 -> 0:28:14.88 You have a relationship.
0:28:14.88 -> 0:28:17.01 They know that I care for them.
0:28:17.01 -> 0:28:18.054 They can trust me.
0:28:18.054 -> 0:28:20.409 And so when I offer them this option,
Dr Cece Calhoun is an assistant professor of medicine in hematology and assistant professor of Pediatrics in hematology and oncology at the 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 yalecancercenter.org. We hope you’ll join us next week to learn more about the fight against cancer here on Connecticut Public radio funding for Yale Cancer Answers is provided by Smilow Cancer Hospital and AstraZeneca.