

WEBVTT Kind: captions Language: en

00:00:01.369 --> 00:00:03.952 [♪]

00:00:05.700 --> 00:00:07.840 - In order for the heart to function well,

00:00:07.840 --> 00:00:11.253 it has to be pumping in a very coordinated fashion.

00:00:13.040 --> 00:00:14.700 For that all to work together,

00:00:14.700 --> 00:00:17.423 there's a complex electrical system inside the heart.

00:00:18.450 --> 00:00:19.510 - The electrical signals

00:00:19.510 --> 00:00:21.990 are the foundation of the heartbeat.

00:00:21.990 --> 00:00:24.780 An electrical signal leading the a squeeze of the heart

00:00:24.780 --> 00:00:26.283 is like a dance.

00:00:27.630 --> 00:00:29.150 The electricity of the heart

00:00:29.150 --> 00:00:31.230 has to move in a coordinated fashion,

00:00:31.230 --> 00:00:34.160 so that the blood can move through nice and smoothly.

00:00:35.260 --> 00:00:38.330 - That coordination provides the normal rhythm,

00:00:38.330 --> 00:00:40.360 or squeezing pattern for the heart.

00:00:40.370 --> 00:00:41.630 And when that goes awry,

00:00:41.630 --> 00:00:44.480 that's what we call an abnormal rhythm, or an arrhythmia.

00:00:45.480 --> 00:00:47.240 - Abnormal electrical impulses

00:00:47.240 --> 00:00:50.020 can lead to a variety of symptoms in patients,

00:00:50.020 --> 00:00:53.680 and it can even lead to heart failure over time in some patients.

00:00:57.620 --> 00:01:00.700 - I'm Charlotte and I'm 10 years old.

00:01:00.700 --> 00:01:05.520 I do dance, like ballet and Irish dance.

00:01:05.530 --> 00:01:07.700 - The first time she had an episode

00:01:07.700 --> 00:01:09.440 was when she was dancing.

00:01:09.440 --> 00:01:13.870 She was doing Irish dance, which is very aerobic at times,

00:01:13.870 --> 00:01:15.358 and she just stopped and said

00:01:15.358 --> 00:01:17.860 "My heart's beating really fast."

00:01:17.860 --> 00:01:20.710 We checked her pulse, it was definitely going very fast,
00:01:20.710 --> 00:01:22.210 and it just wasn't slowing down
00:01:22.210 --> 00:01:24.270 the normal way you would think it would slow down.
00:01:24.270 --> 00:01:26.540 - It felt like it was popping out
00:01:26.540 --> 00:01:28.360 and it was going super fast
00:01:28.360 --> 00:01:31.240 and I could feel it when I put my hand over it.
00:01:32.830 --> 00:01:36.250 - Charlotte's symptoms were caused by SVT,
00:01:36.250 --> 00:01:38.850 or supraventricular tachycardia,
00:01:38.850 --> 00:01:42.350 which is an abnormally fast heart rhythm.
00:01:42.350 --> 00:01:45.460 So she used both the normal circuit of her heart
00:01:45.460 --> 00:01:48.150 and also this extra electrical pathway in her heart
00:01:48.150 --> 00:01:49.740 to create a circuit,
00:01:49.740 --> 00:01:53.210 that gave her palpitations that were not dangerous
00:01:53.210 --> 00:01:54.110 in and of themselves,
00:01:54.110 --> 00:01:56.550 but understandably very uncomfortable for her.
00:01:56.550 --> 00:01:58.190 - [Charlotte] Sometimes it would just come
00:01:58.190 --> 00:01:59.940 and I would have to stop.
00:01:59.940 --> 00:02:01.760 It's harder for me to dance,
00:02:01.760 --> 00:02:03.760 concentrating on what I'm meant to be doing
00:02:03.760 --> 00:02:05.469 instead of trying to concentrate
00:02:05.469 --> 00:02:08.040 and trying to make it stop.
00:02:08.040 --> 00:02:09.749 - It was nerve wracking, however,
00:02:09.749 --> 00:02:13.538 Dr. Beach was very calming with explaining
00:02:13.538 --> 00:02:15.830 exactly what was happening.
00:02:15.830 --> 00:02:17.210 This is a condition that could be
00:02:17.210 --> 00:02:19.050 potentially very dangerous,
00:02:19.050 --> 00:02:21.100 but this is how we're gonna deal with it.
00:02:22.770 --> 00:02:25.190 - We have special pediatric cardiologists
00:02:25.190 --> 00:02:27.580 who deal with the electrical system of the heart.

00:02:27.580 --> 00:02:30.300 You can think of them as the cardiac electricians,
00:02:30.300 --> 00:02:33.860 if you will, and we call them electrophysiologists.
00:02:33.860 --> 00:02:35.280 - [Dr. Beach] Charlotte underwent a procedure
00:02:35.280 --> 00:02:39.770 that we call an electrophysiology study and ablation.
00:02:39.770 --> 00:02:42.360 We use catheters to access blood vessels
00:02:42.360 --> 00:02:44.970 at the top of the legs to get to the inside of the heart
00:02:44.970 --> 00:02:46.410 through the body.
00:02:46.410 --> 00:02:47.940 We use these catheters to find
00:02:47.940 --> 00:02:50.340 the abnormal electrical signals in the heart
00:02:50.360 --> 00:02:53.910 and then create a little scar right at the exact area,
00:02:53.910 --> 00:02:55.890 so that the electricity can't move
00:02:55.890 --> 00:02:57.520 at that particular site.
00:02:57.520 --> 00:02:59.810 We start by making some geometry of the heart,
00:02:59.810 --> 00:03:02.350 so that we actually have a 3D heart model
00:03:02.350 --> 00:03:03.530 we're looking at,
00:03:03.530 --> 00:03:06.520 and we watch our catheters, and we map the electricity,
00:03:06.520 --> 00:03:10.020 so that we can actually see where the electricity moves through the heart
00:03:10.320 --> 00:03:11.810 and we see the normal electricity
00:03:11.810 --> 00:03:14.220 as well as the abnormal electricity in this way.
00:03:15.220 --> 00:03:16.630 - [Heather] With the ablation procedure,
00:03:16.630 --> 00:03:19.400 she would only have to be in for a day or two at most,
00:03:19.400 --> 00:03:22.390 and it would be through the femoral veins,
00:03:22.390 --> 00:03:24.310 so they don't have to open up her heart
00:03:24.310 --> 00:03:27.633 or anything like that, a very safe procedure.
00:03:30.760 --> 00:03:33.100 - [Dr. Asnes] The programs within the children's heart center
00:03:33.100 --> 00:03:35.980 span everything from heart rhythm abnormalities

00:03:35.984 --> 00:03:38.930 like arrhythmias to heart failure,
00:03:38.930 --> 00:03:40.960 where the heart muscle itself is not working,
00:03:40.960 --> 00:03:44.120 and perhaps the patient needs a heart transplant.
00:03:44.120 --> 00:03:46.040 It's really a comprehensive program
00:03:46.040 --> 00:03:48.830 that takes care of patients and families
00:03:48.830 --> 00:03:51.050 with heart problems that got diagnosed,
00:03:51.050 --> 00:03:53.500 perhaps when they're in utero,
00:03:53.500 --> 00:03:55.054 and we will manage those heart problems
00:03:55.054 --> 00:03:57.170 all the way through til adulthood,
00:03:57.170 --> 00:04:00.070 when our patients are hopefully having their own
families.
00:04:01.020 --> 00:04:02.420 - [Dr. Beach] Charlotte's doing awesome.
00:04:02.420 --> 00:04:04.360 She hasn't had any symptoms
00:04:04.360 --> 00:04:06.390 since she had her procedure.
00:04:06.390 --> 00:04:07.600 - [Heather] She's doing great.
00:04:07.605 --> 00:04:12.200 Since the surgery, she is back to her normal self.
00:04:12.210 --> 00:04:14.610 We just don't have to worry about anything.
00:04:14.610 --> 00:04:16.684 - [Charlotte] It feels better than worrying about
00:04:16.684 --> 00:04:18.830 whenever I do jumps and stuff.
00:04:18.830 --> 00:04:20.955 Is it gonna happen, is it not gonna happen?
00:04:20.960 --> 00:04:24.380 We don't really even think about it much anymore.
00:04:24.380 --> 00:04:26.980 - [Dr. Beach] I just feel so honored
00:04:26.980 --> 00:04:28.279 to be able to play a part
00:04:28.279 --> 00:04:32.000 in allowing Charlotte to not even have this
00:04:32.000 --> 00:04:33.734 be an issue for her.