WEBVTT

NOTE duration: ”00:17:01.184”

NOTE Confidence: 0.9832194

00:00:04.640 --> 00:00:06.799 Indications to perform a focused

NOTE Confidence: 0.9832194

00:00:06.799 --> 00:00:08.500 cardiac ultrasound include

NOTE Confidence: 0.9979439

00:00:09.119 --> 00:00:11.380 assessment of left ventricular function,

NOTE Confidence: 0.9993218

00:00:11.920 --> 00:00:14.179 assessment for pericardial effusion,

NOTE Confidence: 0.99618393

00:00:15.065 --> 00:00:17.305 assessment for relative chamber size

NOTE Confidence: 0.99618393

00:00:17.305 --> 00:00:18.525 and right heart strain,

NOTE Confidence: 0.997052

00:00:18.825 --> 00:00:20.265 and the global assessment of

NOTE Confidence: 0.997052

00:00:20.265 --> 00:00:21.945 the inferior vena cava for

NOTE Confidence: 0.997052

00:00:21.945 --> 00:00:22.845 volume status.

NOTE Confidence: 0.98574984

00:00:25.145 --> 00:00:26.185 A focus will be done

NOTE Confidence: 0.98574984

00:00:26.185 --> 00:00:27.724 with a low frequency transducer.

NOTE Confidence: 0.9833617

00:00:28.265 --> 00:00:29.400 Your best choice will be

NOTE Confidence: 0.9833617

00:00:29.400 --> 00:00:30.920 a phased array probe as

NOTE Confidence: 0.9833617

00:00:30.920 --> 00:00:31.720 it will allow you to

NOTE Confidence: 0.9833617

00:00:31.720 --> 00:00:32.760 look at the heart in

NOTE Confidence: 0.9833617

00:00:32.760 --> 00:00:33.900 between the rib spaces.

NOTE Confidence: 0.998408

00:00:34.600 --> 00:00:35.100 Alternatively,

NOTE Confidence: 0.9902253

00:00:35.479 --> 00:00:36.620 you may use a curvilinear

NOTE Confidence: 0.9902253

00:00:36.840 --> 00:00:37.979 probe as well.

NOTE Confidence: 0.99253553

00:00:39.479 --> 00:00:41.260 A complete focus will consist

NOTE Confidence: 0.99253553

00:00:41.320 --> 00:00:43.159 of five separate views. These

NOTE Confidence: 0.99253553

00:00:43.159 --> 00:00:45.575 include the parasternal long axis,

NOTE Confidence: 0.99253553

00:00:45.795 --> 00:00:47.575 the parasternal short axis,

NOTE Confidence: 0.9886187

00:00:47.955 --> 00:00:49.415 the apical four chamber,

NOTE Confidence: 0.82469803

00:00:49.875 --> 00:00:50.455 a subxiphoid,

NOTE Confidence: 0.9774669

00:00:51.075 --> 00:00:52.775 and an inferior vena cava

NOTE Confidence: 0.9774669

00:00:52.835 --> 00:00:53.335 view.

NOTE Confidence: 0.8961197

00:01:10.325 --> 00:01:11.125 So we start with the

NOTE Confidence: 0.8961197

00:01:11.125 --> 00:01:12.965 parasternal long axis, placing the

NOTE Confidence: 0.8961197

00:01:12.965 --> 00:01:14.584 transducer in the long axis

NOTE Confidence: 0.9177202

00:01:14.965 --> 00:01:16.005 parallel to the long axis

NOTE Confidence: 0.9177202

00:01:16.005 --> 00:01:16.965 of the heart to get

NOTE Confidence: 0.9177202

00:01:16.965 --> 00:01:18.084 an image that looks something

NOTE Confidence: 0.9177202

00:01:18.084 --> 00:01:18.745 like this.

NOTE Confidence: 0.98189616

00:01:19.365 --> 00:01:20.725 Again, you can rotate the

NOTE Confidence: 0.98189616

00:01:20.725 --> 00:01:22.084 transducer to get an image

NOTE Confidence: 0.98189616

00:01:22.084 --> 00:01:22.745 that looks

NOTE Confidence: 0.99189997

00:01:23.250 --> 00:01:23.750 like

NOTE Confidence: 0.997329

00:01:30.770 --> 00:01:31.270 this.

NOTE Confidence: 0.992038

00:01:32.690 --> 00:01:34.130 In the left video clip,

NOTE Confidence: 0.992038

00:01:34.130 --> 00:01:35.490 there is a heart with

NOTE Confidence: 0.992038

00:01:35.490 --> 00:01:36.470 good symmetric

NOTE Confidence: 0.99975556

00:01:36.850 --> 00:01:38.310 squeeze of the left ventricle

NOTE Confidence: 0.9933723

00:01:38.725 --> 00:01:40.245 and nice excursion of the

NOTE Confidence: 0.9933723

00:01:40.245 --> 00:01:41.765 anterior leaflet of the mitral

NOTE Confidence: 0.9933723

00:01:41.765 --> 00:01:43.305 valve hitting the septum.

NOTE Confidence: 0.9785277

00:01:43.685 --> 00:01:44.805 In the video clip on

NOTE Confidence: 0.9785277

00:01:44.805 --> 00:01:46.165 the right, there is severely

NOTE Confidence: 0.9785277

00:01:46.165 --> 00:01:48.005 depressed function in a six

NOTE Confidence: 0.9785277

00:01:48.005 --> 00:01:50.085 week old after cardiac arrest

NOTE Confidence: 0.9785277

00:01:50.085 --> 00:01:50.585 event.

NOTE Confidence: 0.9964507

00:01:51.125 --> 00:01:53.305 Note the poor global squeeze

NOTE Confidence: 0.9964507

00:01:53.530 --> 00:01:54.990 of the entire left ventricle

NOTE Confidence: 0.9964507

00:01:55.290 --> 00:01:56.890 and the absent movement of

NOTE Confidence: 0.9964507

00:01:56.890 --> 00:01:58.030 the mitral valve.

NOTE Confidence: 0.9497102

00:02:03.850 --> 00:02:05.850 The left clip again depicts

NOTE Confidence: 0.9497102

00:02:05.850 --> 00:02:07.335 a normal appearing heart.

NOTE Confidence: 0.9883343

00:02:07.735 --> 00:02:08.775 On the right side of

NOTE Confidence: 0.9883343

00:02:08.775 --> 00:02:09.895 the screen, there is a

NOTE Confidence: 0.9883343

00:02:09.895 --> 00:02:10.395 circumferential

NOTE Confidence: 0.9997

00:02:10.775 --> 00:02:11.995 pericardial effusion

NOTE Confidence: 0.99229133

00:02:12.294 --> 00:02:14.315 with preserved LV function.

NOTE Confidence: 0.99603

00:02:15.014 --> 00:02:16.294 Note the arrow points to

NOTE Confidence: 0.99603

00:02:16.294 --> 00:02:18.135 the effusion collecting to the

NOTE Confidence: 0.99603

00:02:18.135 --> 00:02:20.055 posterior aspect of the heart

NOTE Confidence: 0.99603

00:02:20.055 --> 00:02:20.970 on this view.

NOTE Confidence: 0.99779016

00:02:26.330 --> 00:02:27.950 You can use the descending

NOTE Confidence: 0.99779016

00:02:28.010 --> 00:02:29.230 aorta to differentiate

NOTE Confidence: 0.9991108

00:02:29.530 --> 00:02:31.130 whether a large fluid collection

NOTE Confidence: 0.9991108

00:02:31.130 --> 00:02:32.510 is present within the pericardial

NOTE Confidence: 0.9934108

00:02:32.810 --> 00:02:33.930 sac or outside of the

NOTE Confidence: 0.9934108

00:02:33.930 --> 00:02:34.430 pericardium.

NOTE Confidence: 0.9948368

00:02:35.315 --> 00:02:36.835 In these clips, the descending

NOTE Confidence: 0.9948368

00:02:36.835 --> 00:02:38.035 aorta is marked by an

NOTE Confidence: 0.9948368

00:02:38.035 --> 00:02:38.535 asterisk.

NOTE Confidence: 0.96712506

00:02:39.395 --> 00:02:40.514 Note the clip on the

NOTE Confidence: 0.96712506

00:02:40.514 --> 00:02:42.535 left, a large fluid collection

NOTE Confidence: 0.96712506

00:02:42.755 --> 00:02:44.195 is seen to run-in front

NOTE Confidence: 0.96712506

00:02:44.195 --> 00:02:45.575 of the descending aorta.

NOTE Confidence: 0.9836975

00:02:46.115 --> 00:02:47.475 In contrast on the video

NOTE Confidence: 0.9836975

00:02:47.475 --> 00:02:48.680 clip on the right, a

NOTE Confidence: 0.9836975

00:02:48.680 --> 00:02:50.280 large fluid collection is present

NOTE Confidence: 0.9836975

00:02:50.280 --> 00:02:52.200 behind the descending aorta, and

NOTE Confidence: 0.9836975

00:02:52.200 --> 00:02:52.940 this represents

NOTE Confidence: 0.95309067

00:02:53.240 --> 00:02:54.620 a pleural diffusion.

NOTE Confidence: 0.9759671

00:03:02.735 --> 00:03:03.695 Again on the left of

NOTE Confidence: 0.9759671

00:03:03.695 --> 00:03:04.975 the screen is a normal

NOTE Confidence: 0.9759671

00:03:04.975 --> 00:03:06.655 PSLA view with the left

NOTE Confidence: 0.9759671

00:03:06.655 --> 00:03:08.675 ventricle being the largest chamber

NOTE Confidence: 0.98004705

00:03:09.294 --> 00:03:10.415 that can be seen on

NOTE Confidence: 0.98004705

00:03:10.415 --> 00:03:11.075 the screen.

NOTE Confidence: 0.9787031

00:03:11.855 --> 00:03:12.895 Compare that to the right

NOTE Confidence: 0.9787031

00:03:12.895 --> 00:03:14.175 sided clip where there is

NOTE Confidence: 0.9787031

00:03:14.175 --> 00:03:16.014 an enlarged right ventricle and

NOTE Confidence: 0.9787031

00:03:16.014 --> 00:03:17.135 a child with an atrial

NOTE Confidence: 0.9787031

00:03:17.135 --> 00:03:18.060 septal defect.

NOTE Confidence: 0.9994216

00:03:19.020 --> 00:03:20.300 The ASD can be seen

NOTE Confidence: 0.9994216

00:03:20.300 --> 00:03:21.500 to come into view during

NOTE Confidence: 0.9994216

00:03:21.500 --> 00:03:22.700 the early portion of this

NOTE Confidence: 0.9994216

00:03:22.700 --> 00:03:23.200 clip.

NOTE Confidence: 0.99535674

00:03:23.660 --> 00:03:25.500 The RV has compensated and

NOTE Confidence: 0.99535674

00:03:25.500 --> 00:03:27.020 become enlarged due to the

NOTE Confidence: 0.99535674

00:03:27.020 --> 00:03:27.520 constant

NOTE Confidence: 0.9990999

00:03:27.900 --> 00:03:29.580 left to right shunt through

NOTE Confidence: 0.9990999

00:03:29.580 --> 00:03:30.400 the ASD.

NOTE Confidence: 0.95433867

00:03:36.465 --> 00:03:37.825 And finally in these clips

NOTE Confidence: 0.95433867

00:03:37.825 --> 00:03:39.444 one can compare the normal

NOTE Confidence: 0.95433867

00:03:39.504 --> 00:03:40.944 cardiac structure that can be

NOTE Confidence: 0.95433867

00:03:40.944 --> 00:03:42.224 observed on the clip on

NOTE Confidence: 0.95433867

00:03:42.224 --> 00:03:42.630 the left.

NOTE Confidence: 0.99878484

00:03:43.590 --> 00:03:44.630 The video clip on the

NOTE Confidence: 0.99878484

00:03:44.630 --> 00:03:45.610 right shows

NOTE Confidence: 0.99395186

00:03:46.070 --> 00:03:46.570 severe

NOTE Confidence: 0.9240738

00:03:46.950 --> 00:03:47.450 diffuse

NOTE Confidence: 0.9899242

00:03:47.830 --> 00:03:48.330 hypertrophic

NOTE Confidence: 0.9981898

00:03:48.630 --> 00:03:49.130 cardiomyopathy.

NOTE Confidence: 0.9989486

00:03:50.150 --> 00:03:51.610 This particular adolescent

NOTE Confidence: 0.91445297

00:03:51.910 --> 00:03:54.150 presented with presyncope during a

NOTE Confidence: 0.91445297

00:03:54.150 --> 00:03:55.210 basketball game,

NOTE Confidence: 0.9957935

00:03:55.510 --> 00:03:56.550 and he had a normal

NOTE Confidence: 0.9957935

00:03:56.550 --> 00:03:57.050 echocardiogram

NOTE Confidence: 0.99593383

00:03:57.750 --> 00:03:59.584 several years prior to this

NOTE Confidence: 0.99759674

00:03:59.885 --> 00:04:01.105 point of care study.

NOTE Confidence: 0.8476118

00:04:24.570 --> 00:04:25.529 Then if you rotate it

NOTE Confidence: 0.8476118

00:04:25.529 --> 00:04:27.130 ninety degrees, you'll get what

NOTE Confidence: 0.8476118

00:04:27.130 --> 00:04:28.330 we call a parasternal short

NOTE Confidence: 0.8476118

00:04:28.330 --> 00:04:28.605 axis

NOTE Confidence: 0.92221576

00:04:30.445 --> 00:04:31.325 axis. And then if you

NOTE Confidence: 0.92221576

00:04:31.325 --> 00:04:32.845 slide towards the apex of

NOTE Confidence: 0.92221576

00:04:32.845 --> 00:04:33.505 the heart,

NOTE Confidence: 0.873734

00:04:35.245 --> 00:04:36.365 you should see the papillary

NOTE Confidence: 0.873734

00:04:36.365 --> 00:04:36.865 muscles.

NOTE Confidence: 0.82951397

00:04:37.565 --> 00:04:38.525 And you keep sliding to

NOTE Confidence: 0.82951397

00:04:38.525 --> 00:04:40.285 see the mitral valve. Just

NOTE Confidence: 0.82951397

00:04:40.285 --> 00:04:41.650 slide, keep sliding. Keep sliding.

NOTE Confidence: 0.82951397

00:04:41.650 --> 00:04:42.289 You should be able to

NOTE Confidence: 0.82951397

00:04:42.289 --> 00:04:43.089 see that your body got

NOTE Confidence: 0.82951397

00:04:43.089 --> 00:04:43.589 below.

NOTE Confidence: 0.88128424

00:04:49.409 --> 00:04:50.789 Here are two parasternal

NOTE Confidence: 0.94145125

00:04:51.169 --> 00:04:53.190 short access comparison views.

NOTE Confidence: 0.9986432

00:04:53.810 --> 00:04:54.770 On the left clip, you

NOTE Confidence: 0.9986432

00:04:54.770 --> 00:04:56.205 can see the normal circular

NOTE Confidence: 0.9986432

00:04:56.205 --> 00:04:57.745 appearance of the left ventricle

NOTE Confidence: 0.9986432

00:04:57.885 --> 00:04:59.585 at the papillary muscle level.

NOTE Confidence: 0.9783753

00:04:59.964 --> 00:05:01.404 Note the nice symmetric squeeze

NOTE Confidence: 0.9783753

00:05:01.404 --> 00:05:02.545 and no evidence of

NOTE Confidence: 0.99814594

00:05:03.005 --> 00:05:04.225 pericardial effusion.

NOTE Confidence: 0.99784344

00:05:05.005 --> 00:05:06.045 The clip on the right

NOTE Confidence: 0.99784344

00:05:06.045 --> 00:05:08.225 shows a large pericardial effusion.

NOTE Confidence: 0.9848809

00:05:09.080 --> 00:05:10.600 Although the PSSA view is

NOTE Confidence: 0.9848809

00:05:10.600 --> 00:05:11.800 not the best for smaller

NOTE Confidence: 0.9848809

00:05:11.800 --> 00:05:14.040 effusions, larger effusions can be

NOTE Confidence: 0.9848809

00:05:14.040 --> 00:05:16.380 confirmed on this cardiac window.

NOTE Confidence: 0.9816605

00:05:16.839 --> 00:05:18.120 Note that the large fluid

NOTE Confidence: 0.9816605

00:05:18.120 --> 00:05:19.480 collection is seen to run

NOTE Confidence: 0.9816605

00:05:19.480 --> 00:05:21.740 anterior to the descending aorta,

NOTE Confidence: 0.9816605

00:05:21.960 --> 00:05:23.000 which can be seen here

NOTE Confidence: 0.9816605

00:05:23.000 --> 00:05:24.264 in short access as it

NOTE Confidence: 0.9816605

00:05:24.264 --> 00:05:25.724 courses behind the

NOTE Confidence: 0.99899006

00:05:26.104 --> 00:05:26.604 heart.

NOTE Confidence: 0.9532978

00:05:32.745 --> 00:05:33.865 Here we can compare the

NOTE Confidence: 0.9532978

00:05:33.865 --> 00:05:35.705 relative chamber sizes in a

NOTE Confidence: 0.9532978

00:05:35.705 --> 00:05:37.785 PSSI view. The normal clip

NOTE Confidence: 0.9532978

00:05:37.785 --> 00:05:38.985 on the left, you can

NOTE Confidence: 0.9532978

00:05:38.985 --> 00:05:40.400 observe the cross on shaped

NOTE Confidence: 0.9532978

00:05:40.400 --> 00:05:41.300 right ventricle

NOTE Confidence: 0.9570452

00:05:41.600 --> 00:05:43.040 next to the doughnut shaped

NOTE Confidence: 0.9570452

00:05:43.040 --> 00:05:43.779 left ventricle.

NOTE Confidence: 0.98567486

00:05:44.320 --> 00:05:45.440 The left ventricle is the

NOTE Confidence: 0.98567486

00:05:45.440 --> 00:05:46.820 larger of the two chambers.

NOTE Confidence: 0.99892026

00:05:47.520 --> 00:05:48.880 The abnormal clip on the

NOTE Confidence: 0.99892026

00:05:48.880 --> 00:05:50.479 right shows an enlarged right

NOTE Confidence: 0.99892026

00:05:50.479 --> 00:05:50.979 ventricle

NOTE Confidence: 0.9424885

00:05:51.360 --> 00:05:52.479 and an infant who was

NOTE Confidence: 0.9424885

00:05:52.479 --> 00:05:54.580 eventually diagnosed with aortic stenosis.

NOTE Confidence: 0.9967108

00:05:55.315 --> 00:05:56.595 The RV here is the

NOTE Confidence: 0.9967108

00:05:56.595 --> 00:05:57.975 bigger of the two chambers.

NOTE Confidence: 0.92304975

00:05:58.595 --> 00:06:00.455 There is also abnormal squeeze

NOTE Confidence: 0.99691

00:06:00.835 --> 00:06:02.775 and global depression of systolic

NOTE Confidence: 0.99691

00:06:02.915 --> 00:06:04.375 function on this view.

NOTE Confidence: 0.93165535

00:06:04.755 --> 00:06:06.035 These next set of clips

NOTE Confidence: 0.93165535

00:06:06.035 --> 00:06:07.815 once again compare a normal

NOTE Confidence: 0.93165535

00:06:07.955 --> 00:06:08.455 PSSA

NOTE Confidence: 0.9971587

00:06:08.995 --> 00:06:09.975 chamber evaluation

NOTE Confidence: 0.999636

00:06:10.355 --> 00:06:11.100 on the left

NOTE Confidence: 0.93267334

00:06:11.660 --> 00:06:13.680 compared to a markedly abnormal

NOTE Confidence: 0.9976932

00:06:14.380 --> 00:06:15.839 appearance of the right ventricle

NOTE Confidence: 0.9729894

00:06:16.220 --> 00:06:17.500 on the right. In this

NOTE Confidence: 0.9729894

00:06:17.500 --> 00:06:18.940 abnormal clip, there is a

NOTE Confidence: 0.9729894

00:06:18.940 --> 00:06:21.440 dreaded d sign with flattening

NOTE Confidence: 0.9729894

00:06:21.500 --> 00:06:22.320 of the intraventricular

NOTE Confidence: 0.99990445

00:06:23.020 --> 00:06:23.520 septum

NOTE Confidence: 0.98760253

00:06:24.065 --> 00:06:25.285 due to a large pulmonary

NOTE Confidence: 0.98760253

00:06:25.425 --> 00:06:25.925 embolus,

NOTE Confidence: 0.99378663

00:06:26.625 --> 00:06:28.725 which has caused increased pressures

NOTE Confidence: 0.99378663

00:06:28.785 --> 00:06:30.385 in the right ventricle and

NOTE Confidence: 0.99378663

00:06:30.385 --> 00:06:31.604 subsequent enlargement.

NOTE Confidence: 0.930801

00:06:32.305 --> 00:06:33.824 The septal wall flattening is

NOTE Confidence: 0.930801

00:06:33.824 --> 00:06:35.824 a nonspecific finding and can

NOTE Confidence: 0.930801

00:06:35.824 --> 00:06:37.264 be caused by any disease

NOTE Confidence: 0.930801

00:06:37.264 --> 00:06:39.490 process that elevates pressures in

NOTE Confidence: 0.930801

00:06:39.490 --> 00:06:41.350 the right ventricle and therefore

NOTE Confidence: 0.930801

00:06:41.410 --> 00:06:43.270 transmits a d shaped appearance

NOTE Confidence: 0.930801

00:06:43.410 --> 00:06:44.710 to the left ventricle.

NOTE Confidence: 0.8166466

00:07:06.685 --> 00:07:07.529 Next we will look at

NOTE Confidence: 0.8166466

00:07:07.529 --> 00:07:08.190 is something

NOTE Confidence: 0.9485974

00:07:08.650 --> 00:07:09.770 called an apical four chamber

NOTE Confidence: 0.9485974

00:07:09.770 --> 00:07:10.270 view,

NOTE Confidence: 0.9077905

00:07:10.729 --> 00:07:12.009 which again, you find the

NOTE Confidence: 0.9077905

00:07:12.009 --> 00:07:13.069 apex of the heart,

NOTE Confidence: 0.7835903

00:07:13.530 --> 00:07:14.430 tilt up,

NOTE Confidence: 0.6863547

00:07:15.370 --> 00:07:16.250 and give me a little

NOTE Confidence: 0.6863547

00:07:16.250 --> 00:07:16.990 bit more back.

NOTE Confidence: 0.9887461

00:07:19.849 --> 00:07:21.229 Again, you wanna rotate

NOTE Confidence: 0.98714864

00:07:22.014 --> 00:07:23.315 until you get the image

NOTE Confidence: 0.9222289

00:07:24.255 --> 00:07:25.455 that you have here. Again,

NOTE Confidence: 0.9222289

00:07:25.455 --> 00:07:26.595 you can tilt the transducer

NOTE Confidence: 0.9222289

00:07:26.655 --> 00:07:27.474 back and forth

NOTE Confidence: 0.937071

00:07:28.095 --> 00:07:29.235 to make sure that the

NOTE Confidence: 0.937071

00:07:29.375 --> 00:07:30.974 ventricular septum, the atrial septum

NOTE Confidence: 0.937071

00:07:30.974 --> 00:07:32.095 lines up with the vertical

NOTE Confidence: 0.937071

00:07:32.095 --> 00:07:33.155 axis of the image.

NOTE Confidence: 0.991564

00:07:39.970 --> 00:07:41.970 On this comparison split screen

NOTE Confidence: 0.991564

00:07:41.970 --> 00:07:43.410 for the apical four chamber

NOTE Confidence: 0.991564

00:07:43.410 --> 00:07:45.170 view, the left clip shows

NOTE Confidence: 0.991564

00:07:45.170 --> 00:07:46.470 a heart with good function.

NOTE Confidence: 0.9949285

00:07:46.985 --> 00:07:48.105 The lateral walls of the

NOTE Confidence: 0.9949285

00:07:48.105 --> 00:07:49.465 left and right ventricle are

NOTE Confidence: 0.9949285

00:07:49.465 --> 00:07:51.305 both seen to squeeze nicely

NOTE Confidence: 0.9949285

00:07:51.305 --> 00:07:52.365 towards the septum.

NOTE Confidence: 0.9860318

00:07:53.305 --> 00:07:54.665 The clip on the right

NOTE Confidence: 0.9860318

00:07:54.665 --> 00:07:56.585 shows abnormal function on this

NOTE Confidence: 0.9860318

00:07:56.585 --> 00:07:58.185 apical four chamber view of

NOTE Confidence: 0.9860318

00:07:58.185 --> 00:07:59.520 a two week old with

NOTE Confidence: 0.9860318

00:07:59.520 --> 00:08:00.260 a juxteductal

NOTE Confidence: 0.92034006

00:08:00.800 --> 00:08:01.860 aortic coarctation.

NOTE Confidence: 0.9893835

00:08:02.639 --> 00:08:04.580 This newborn presented with hypothermia,

NOTE Confidence: 0.98084104

00:08:05.040 --> 00:08:07.060 lethargy, and unexplained dyspnea,

NOTE Confidence: 0.99905014

00:08:07.440 --> 00:08:08.560 but had a normal heart

NOTE Confidence: 0.99905014

00:08:08.560 --> 00:08:09.760 rate and blood pressure at

NOTE Confidence: 0.99905014

00:08:09.760 --> 00:08:11.200 the time this focus was

NOTE Confidence: 0.99905014

00:08:11.200 --> 00:08:12.960 performed. There appears to be

NOTE Confidence: 0.99905014

00:08:12.960 --> 00:08:14.895 depressed function and poor squeeze

NOTE Confidence: 0.99905014

00:08:14.895 --> 00:08:16.275 of the ventricular walls.

NOTE Confidence: 0.97600937

00:08:16.895 --> 00:08:18.014 In addition, you could see

NOTE Confidence: 0.97600937

00:08:18.014 --> 00:08:19.375 air bubbles coursing through the

NOTE Confidence: 0.97600937

00:08:19.375 --> 00:08:20.495 right atrium and the right

NOTE Confidence: 0.97600937

00:08:20.495 --> 00:08:20.995 ventricle.

NOTE Confidence: 0.9964474

00:08:21.375 --> 00:08:23.074 You may experience this finding

NOTE Confidence: 0.9964474

00:08:23.215 --> 00:08:25.235 if, the focus is performed

NOTE Confidence: 0.9964474

00:08:25.294 --> 00:08:26.995 during IV fluid administration.

NOTE Confidence: 0.9897476

00:08:27.375 --> 00:08:28.735 The other interesting finding here

NOTE Confidence: 0.9897476

00:08:28.735 --> 00:08:29.455 is that there is an

NOTE Confidence: 0.9897476

00:08:29.455 --> 00:08:30.930 occasional air bubble that escapes

NOTE Confidence: 0.9897476

00:08:30.930 --> 00:08:32.150 into the left atrium.

NOTE Confidence: 0.99438286

00:08:32.530 --> 00:08:33.570 This finding is caused by

NOTE Confidence: 0.99438286

00:08:33.570 --> 00:08:35.030 a direct atrial communication

NOTE Confidence: 0.94778794

00:08:35.809 --> 00:08:36.850 such as would be seen

NOTE Confidence: 0.94778794

00:08:36.850 --> 00:08:38.290 with a small ASD or

NOTE Confidence: 0.94778794

00:08:38.290 --> 00:08:38.950 a PFO.

NOTE Confidence: 0.94760996

00:08:45.575 --> 00:08:47.335 Here we see comparison views

NOTE Confidence: 0.94760996

00:08:47.335 --> 00:08:48.875 again of a normal appearing

NOTE Confidence: 0.94760996

00:08:48.934 --> 00:08:50.375 typical four chamber view on

NOTE Confidence: 0.94760996

00:08:50.375 --> 00:08:51.035 the left.

NOTE Confidence: 0.9994082

00:08:51.575 --> 00:08:52.695 The video clip on the

NOTE Confidence: 0.9994082

00:08:52.695 --> 00:08:53.895 right is striking for the

NOTE Confidence: 0.9994082

00:08:53.895 --> 00:08:55.575 large fluid collection that is

NOTE Confidence: 0.9994082

00:08:55.575 --> 00:08:57.654 encircling the heart. This large

NOTE Confidence: 0.9994082

00:08:57.654 --> 00:08:59.575 pericardial effusion is starting to

NOTE Confidence: 0.9994082

00:08:59.575 --> 00:09:01.809 show signs of tamponade physiology.

NOTE Confidence: 0.998978

00:09:02.670 --> 00:09:04.270 The star marks the lateral

NOTE Confidence: 0.998978

00:09:04.270 --> 00:09:05.650 wall of the right ventricle.

NOTE Confidence: 0.9968551

00:09:06.190 --> 00:09:07.730 This degree of fluid accumulation

NOTE Confidence: 0.9968551

00:09:07.870 --> 00:09:09.790 in the pericardial sac has

NOTE Confidence: 0.9968551

00:09:09.790 --> 00:09:11.390 now overcome the pressures within

NOTE Confidence: 0.9968551

00:09:11.390 --> 00:09:12.210 the right ventricle.

NOTE Confidence: 0.9996936

00:09:12.750 --> 00:09:14.190 This is an important finding

NOTE Confidence: 0.9996936

00:09:14.190 --> 00:09:14.850 to recognize

NOTE Confidence: 0.97660446

00:09:15.275 --> 00:09:16.315 as in bowing of the

NOTE Confidence: 0.97660446

00:09:16.315 --> 00:09:17.515 lateral wall of the right

NOTE Confidence: 0.97660446

00:09:17.515 --> 00:09:19.755 ventricle is an ominous finding

NOTE Confidence: 0.97660446

00:09:19.755 --> 00:09:21.455 that requires prompt recognition

NOTE Confidence: 0.9581418

00:09:22.235 --> 00:09:24.255 and preparations for pericardiocentesis.

NOTE Confidence: 0.946459

00:09:31.679 --> 00:09:33.040 In this split screen, you

NOTE Confidence: 0.946459

00:09:33.040 --> 00:09:34.339 can see on the left

NOTE Confidence: 0.946459

00:09:34.399 --> 00:09:35.220 normal appearing

NOTE Confidence: 0.996541

00:09:36.160 --> 00:09:37.139 chamber sizes

NOTE Confidence: 0.9602748

00:09:37.519 --> 00:09:39.300 and the dominant left ventricle,

NOTE Confidence: 0.9602748

00:09:39.519 --> 00:09:40.800 which is the largest of

NOTE Confidence: 0.9602748

00:09:40.800 --> 00:09:41.760 all the chambers on the

NOTE Confidence: 0.9602748

00:09:41.760 --> 00:09:42.260 screen.

NOTE Confidence: 0.99637777

00:09:42.575 --> 00:09:44.015 The abnormal video clip on

NOTE Confidence: 0.99637777

00:09:44.015 --> 00:09:45.475 the right shows an enlarged

NOTE Confidence: 0.99637777

00:09:45.535 --> 00:09:47.315 right ventricle in an adolescent

NOTE Confidence: 0.99637777

00:09:47.455 --> 00:09:48.835 with a pulmonary embolus.

NOTE Confidence: 0.9980782

00:09:49.295 --> 00:09:50.335 There is a greater than

NOTE Confidence: 0.9980782

00:09:50.335 --> 00:09:51.695 one to one ratio in

NOTE Confidence: 0.9980782

00:09:51.695 --> 00:09:52.575 the size of the right

NOTE Confidence: 0.9980782

00:09:52.575 --> 00:09:54.255 ventricle compared to the left

NOTE Confidence: 0.9980782

00:09:54.255 --> 00:09:54.755 ventricle.

NOTE Confidence: 0.99490607

00:09:55.340 --> 00:09:56.300 This is seen in the

NOTE Confidence: 0.99490607

00:09:56.300 --> 00:09:57.820 presence of right sided heart

NOTE Confidence: 0.99490607

00:09:57.820 --> 00:09:59.660 strain, which is typically caused

NOTE Confidence: 0.99490607

00:09:59.660 --> 00:10:01.580 by pathology that elevates the

NOTE Confidence: 0.99490607

00:10:01.580 --> 00:10:03.440 pressures in the pulmonary vasculature.

NOTE Confidence: 0.9984482

00:10:04.700 --> 00:10:06.460 One last caveat to consider

NOTE Confidence: 0.9984482

00:10:06.460 --> 00:10:07.820 on the apical four chamber

NOTE Confidence: 0.9984482

00:10:07.820 --> 00:10:09.615 view is the importance of

NOTE Confidence: 0.9984482

00:10:09.615 --> 00:10:11.375 correlating the indicator on the

NOTE Confidence: 0.9984482

00:10:11.375 --> 00:10:13.135 patient to the indicator on

NOTE Confidence: 0.9984482

00:10:13.135 --> 00:10:13.795 the screen.

NOTE Confidence: 0.9878168

00:10:14.255 --> 00:10:16.095 A good anatomical pearl to

NOTE Confidence: 0.9878168

00:10:16.095 --> 00:10:17.295 take away is that the

NOTE Confidence: 0.9878168

00:10:17.295 --> 00:10:19.535 tricuspid valve will generally take

NOTE Confidence: 0.9878168

00:10:19.535 --> 00:10:20.975 off closer to the probe

NOTE Confidence: 0.9878168

00:10:20.975 --> 00:10:22.255 and therefore higher on the

NOTE Confidence: 0.9878168

00:10:22.255 --> 00:10:23.535 screen when compared to the

NOTE Confidence: 0.9878168

00:10:23.535 --> 00:10:24.515 mitral valve.

NOTE Confidence: 0.9966399

00:10:24.860 --> 00:10:26.460 On first glance, the video

NOTE Confidence: 0.9966399

00:10:26.460 --> 00:10:27.500 clip on the right would

NOTE Confidence: 0.9966399

00:10:27.500 --> 00:10:28.620 appear to be that of

NOTE Confidence: 0.9966399

00:10:28.620 --> 00:10:30.720 an abnormally enlarged right ventricle.

NOTE Confidence: 0.99614793

00:10:31.340 --> 00:10:32.540 This clip is actually a

NOTE Confidence: 0.99614793

00:10:32.540 --> 00:10:34.320 result of an operator error.

NOTE Confidence: 0.8946743

00:10:34.620 --> 00:10:36.080 Instead of having the indicator

NOTE Confidence: 0.8946743

00:10:36.140 --> 00:10:36.795 towards the patient

NOTE Confidence: 0.6250484

00:10:44.154 --> 00:10:44.654 screen

NOTE Confidence: 0.9315732

00:10:45.274 --> 00:10:46.735 by a hundred eighty degrees,

NOTE Confidence: 0.9315732

00:10:46.795 --> 00:10:48.495 giving off a false impression

NOTE Confidence: 0.9315732

00:10:48.795 --> 00:10:50.815 of enlarged right sided structures.

NOTE Confidence: 0.99288464

00:10:51.690 --> 00:10:53.370 Since the mitral valve takeoff

NOTE Confidence: 0.99288464

00:10:53.370 --> 00:10:54.330 is lower than that of

NOTE Confidence: 0.99288464

00:10:54.330 --> 00:10:56.250 the tricuspid valve, you can

NOTE Confidence: 0.99288464

00:10:56.250 --> 00:10:57.850 detect that this is likely

NOTE Confidence: 0.99288464

00:10:57.850 --> 00:10:59.470 due to a flipped probe

NOTE Confidence: 0.99288464

00:10:59.770 --> 00:11:01.470 and not due to true

NOTE Confidence: 0.99288464

00:11:01.610 --> 00:11:03.070 right ventricular hypertrophy.

NOTE Confidence: 0.79917574

00:11:26.880 --> 00:11:28.260 And you're putting the transducer

NOTE Confidence: 0.7927067

00:11:28.800 --> 00:11:29.540 in the subdividend,

NOTE Confidence: 0.98427737

00:11:30.480 --> 00:11:31.895 aiming up. Sometimes it's easier

NOTE Confidence: 0.98427737

00:11:31.895 --> 00:11:32.815 to put the hand on

NOTE Confidence: 0.98427737

00:11:32.815 --> 00:11:33.635 top of the transducer

NOTE Confidence: 0.8939731

00:11:34.175 --> 00:11:35.055 and then aim up. And

NOTE Confidence: 0.8939731

00:11:35.055 --> 00:11:36.175 then Antonio is gonna help

NOTE Confidence: 0.8939731

00:11:36.175 --> 00:11:37.375 me change the depth so

NOTE Confidence: 0.8939731

00:11:37.375 --> 00:11:37.875 that

NOTE Confidence: 0.8591418

00:11:38.735 --> 00:11:40.035 it fills the heart.

NOTE Confidence: 0.95269996

00:11:42.735 --> 00:11:43.855 Again, you might find this

NOTE Confidence: 0.95269996

00:11:43.855 --> 00:11:45.395 difficult in a skinny patient.

NOTE Confidence: 0.973242

00:11:50.800 --> 00:11:52.800 Here we find comparison views

NOTE Confidence: 0.973242

00:11:52.800 --> 00:11:54.959 of the subxiphoid window. On

NOTE Confidence: 0.973242

00:11:54.959 --> 00:11:55.519 the left, you see the

NOTE Confidence: 0.973242

00:11:55.519 --> 00:11:56.720 normal positioning of the heart

NOTE Confidence: 0.973242

00:11:56.720 --> 00:11:58.320 behind the liver as we

NOTE Confidence: 0.973242

00:11:58.320 --> 00:11:59.600 would expect to see on

NOTE Confidence: 0.973242

00:11:59.600 --> 00:12:00.660 a fast examination.

NOTE Confidence: 0.9964888

00:12:01.194 --> 00:12:02.074 The liver here is used

NOTE Confidence: 0.9964888

00:12:02.074 --> 00:12:03.355 as an acoustic window to

NOTE Confidence: 0.9964888

00:12:03.355 --> 00:12:04.074 get a good view of

NOTE Confidence: 0.9964888

00:12:04.074 --> 00:12:05.214 the cardiac chambers.

NOTE Confidence: 0.9978017

00:12:05.675 --> 00:12:06.954 On the abnormal image on

NOTE Confidence: 0.9978017

00:12:06.954 --> 00:12:08.235 the right of the screen,

NOTE Confidence: 0.9978017

00:12:08.235 --> 00:12:09.855 you see a large pericardial

NOTE Confidence: 0.9978017

00:12:10.074 --> 00:12:11.595 effusion with collapse of the

NOTE Confidence: 0.9978017

00:12:11.595 --> 00:12:12.795 lateral wall of the right

NOTE Confidence: 0.9978017

00:12:12.795 --> 00:12:13.295 ventricle.

NOTE Confidence: 0.99317867

00:12:13.990 --> 00:12:15.750 Although this large effusion appears

NOTE Confidence: 0.99317867

00:12:15.750 --> 00:12:16.730 to be circumferential,

NOTE Confidence: 0.9992883

00:12:17.430 --> 00:12:18.630 the most sensitive place to

NOTE Confidence: 0.9992883

00:12:18.630 --> 00:12:20.230 check for pericardial effusion on

NOTE Confidence: 0.9992883

00:12:20.230 --> 00:12:22.150 the subxiphoid window is between

NOTE Confidence: 0.9992883

00:12:22.150 --> 00:12:22.809 the liver

NOTE Confidence: 0.9987839

00:12:23.110 --> 00:12:24.330 and the right ventricle.

NOTE Confidence: 0.9852196

00:12:30.325 --> 00:12:31.525 This is an example of

NOTE Confidence: 0.9852196

00:12:31.525 --> 00:12:33.605 a small pericardial effusion as

NOTE Confidence: 0.9852196

00:12:33.605 --> 00:12:36.025 seen on subsyphoid view found

NOTE Confidence: 0.9852196

00:12:36.085 --> 00:12:38.325 anteriorly between the liver and

NOTE Confidence: 0.9852196

00:12:38.325 --> 00:12:39.145 the right ventricle.

NOTE Confidence: 0.86599904

00:13:11.839 --> 00:13:13.139 We're gonna look at intravascular

NOTE Confidence: 0.86599904

00:13:13.279 --> 00:13:14.259 status, intravascular

NOTE Confidence: 0.89823437

00:13:14.559 --> 00:13:16.079 volume status by looking at

NOTE Confidence: 0.89823437

00:13:16.079 --> 00:13:17.679 the inferior vena cava. You

NOTE Confidence: 0.89823437

00:13:17.679 --> 00:13:18.800 put the transducer right in

NOTE Confidence: 0.89823437

00:13:18.800 --> 00:13:20.175 the midline, subside flow process

NOTE Confidence: 0.7454842

00:13:21.934 --> 00:13:22.515 tilting up.

NOTE Confidence: 0.6830493

00:13:23.455 --> 00:13:24.255 You should be able to

NOTE Confidence: 0.6830493

00:13:24.255 --> 00:13:25.295 see the IVC follow it

NOTE Confidence: 0.6830493

00:13:25.295 --> 00:13:26.175 through the liver, all the

NOTE Confidence: 0.6830493

00:13:26.175 --> 00:13:27.554 way and tranclar right away.

NOTE Confidence: 0.95168066

00:13:28.415 --> 00:13:29.695 Alternatively, you can turn the

NOTE Confidence: 0.95168066

00:13:29.695 --> 00:13:30.834 transducer longitudinally,

NOTE Confidence: 0.91150707

00:13:31.214 --> 00:13:32.654 and then following the inferior

NOTE Confidence: 0.91150707

00:13:32.654 --> 00:13:33.394 vena cava.

NOTE Confidence: 0.9234295

00:13:39.699 --> 00:13:40.420 And you can try to

NOTE Confidence: 0.9234295

00:13:40.420 --> 00:13:41.540 open it up by rotating

NOTE Confidence: 0.9234295

00:13:41.540 --> 00:13:42.500 back and forth until you

NOTE Confidence: 0.9234295

00:13:42.500 --> 00:13:43.000 see

NOTE Confidence: 0.9343053

00:13:43.459 --> 00:13:44.040 it entering

NOTE Confidence: 0.6424038

00:13:44.820 --> 00:13:45.959 and ready to go.

NOTE Confidence: 0.748296

00:13:46.865 --> 00:13:48.065 You can see the respiratory

NOTE Confidence: 0.748296

00:13:48.065 --> 00:13:48.565 evaluation.

NOTE Confidence: 0.6609637

00:13:50.384 --> 00:13:51.845 And the beautiful anatomy.

NOTE Confidence: 0.99091995

00:13:58.384 --> 00:13:59.850 So the IVC has been

NOTE Confidence: 0.99091995

00:13:59.929 --> 00:14:01.470 studied in many different manners

NOTE Confidence: 0.99091995

00:14:01.529 --> 00:14:03.529 and many different contexts to

NOTE Confidence: 0.99091995

00:14:03.529 --> 00:14:04.649 see if it can be

NOTE Confidence: 0.99091995

00:14:04.649 --> 00:14:06.329 used as a reliable tool

NOTE Confidence: 0.99091995

00:14:06.329 --> 00:14:08.190 to assess for volume status.

NOTE Confidence: 0.99075717

00:14:08.809 --> 00:14:10.009 To some degree, this is

NOTE Confidence: 0.99075717

00:14:10.009 --> 00:14:12.329 nuanced research that falls beyond

NOTE Confidence: 0.99075717

00:14:12.329 --> 00:14:13.690 the scope of this learning

NOTE Confidence: 0.99075717

00:14:13.690 --> 00:14:14.190 tutorial.

NOTE Confidence: 0.99123657

00:14:14.985 --> 00:14:16.605 However, you can find information

NOTE Confidence: 0.99123657

00:14:16.825 --> 00:14:18.205 you gather from the IVC

NOTE Confidence: 0.99123657

00:14:18.345 --> 00:14:19.625 to be a useful piece

NOTE Confidence: 0.99123657

00:14:19.625 --> 00:14:20.365 of the puzzle,

NOTE Confidence: 0.96859944

00:14:20.825 --> 00:14:22.265 especially when you combine this

NOTE Confidence: 0.96859944

00:14:22.265 --> 00:14:24.025 information with the other cardiac

NOTE Confidence: 0.96859944

00:14:24.025 --> 00:14:25.325 views that you have obtained.

NOTE Confidence: 0.96859944

00:14:25.625 --> 00:14:27.245 Here we find three different

NOTE Confidence: 0.96859944

00:14:27.464 --> 00:14:29.385 calibers of the IVC and

NOTE Confidence: 0.96859944

00:14:29.385 --> 00:14:30.205 long axis.

NOTE Confidence: 0.9545129

00:14:30.839 --> 00:14:32.200 On the left most video

NOTE Confidence: 0.9545129

00:14:32.200 --> 00:14:33.399 clip, you see a flat

NOTE Confidence: 0.9545129

00:14:33.399 --> 00:14:35.399 IVC, which seems to collapse

NOTE Confidence: 0.9545129

00:14:35.399 --> 00:14:35.899 completely,

NOTE Confidence: 0.9992116

00:14:36.440 --> 00:14:37.579 suggestive of hypovolemia

NOTE Confidence: 0.9963674

00:14:37.959 --> 00:14:38.620 or dehydration.

NOTE Confidence: 0.9964634

00:14:39.320 --> 00:14:40.120 In the middle of the

NOTE Confidence: 0.9964634

00:14:40.120 --> 00:14:41.160 screen, you see a full

NOTE Confidence: 0.9964634

00:14:41.160 --> 00:14:43.260 IVC with some proximal collapse.

NOTE Confidence: 0.9952723

00:14:43.745 --> 00:14:45.605 Clinical correlation is necessary

NOTE Confidence: 0.98493695

00:14:45.985 --> 00:14:48.305 with particular attention paid to

NOTE Confidence: 0.98493695

00:14:48.305 --> 00:14:50.464 the patient's respiratory dynamics. The

NOTE Confidence: 0.98493695

00:14:50.464 --> 00:14:51.425 clip on the right shows

NOTE Confidence: 0.98493695

00:14:51.425 --> 00:14:53.024 a plump IVC without much

NOTE Confidence: 0.98493695

00:14:53.024 --> 00:14:54.644 collapse seen during inspiration.

NOTE Confidence: 0.9988597

00:14:55.185 --> 00:14:56.625 In the right clinical context,

NOTE Confidence: 0.9988597

00:14:56.625 --> 00:14:57.825 this is suggestive of heart

NOTE Confidence: 0.9988597

00:14:57.825 --> 00:14:59.045 failure and myocardial

NOTE Confidence: 0.9992312

00:14:59.400 --> 00:15:00.380 pump dysfunction.

NOTE Confidence: 0.994704

00:15:04.120 --> 00:15:05.400 A five year old girl

NOTE Confidence: 0.994704

00:15:05.400 --> 00:15:06.920 presents with weight loss, cough,

NOTE Confidence: 0.994704

00:15:06.920 --> 00:15:08.760 and difficulty sleeping for several

NOTE Confidence: 0.994704

00:15:08.760 --> 00:15:09.260 days.

NOTE Confidence: 0.9890839

00:15:09.720 --> 00:15:11.000 On physical exam, there is

NOTE Confidence: 0.9890839

00:15:11.000 --> 00:15:13.045 an elevated respiratory rate, hepatomegaly,

NOTE Confidence: 0.9979952

00:15:13.505 --> 00:15:14.485 and a loud murmur.

NOTE Confidence: 0.99868155

00:15:14.945 --> 00:15:15.445 Electrocardiogram

NOTE Confidence: 0.9871225

00:15:15.825 --> 00:15:17.445 reveals left axis deviation.

NOTE Confidence: 0.9922611

00:15:18.305 --> 00:15:20.085 Vital signs are as shown.

NOTE Confidence: 0.9946735

00:15:20.545 --> 00:15:22.065 How would you interpret the

NOTE Confidence: 0.9946735

00:15:22.065 --> 00:15:23.605 following focus images?

NOTE Confidence: 0.98603594

00:16:01.310 --> 00:16:02.350 A four year old boy

NOTE Confidence: 0.98603594

00:16:02.350 --> 00:16:04.110 presents with intermittent vomiting and

NOTE Confidence: 0.98603594

00:16:04.110 --> 00:16:05.985 cough for several weeks. He

NOTE Confidence: 0.98603594

00:16:05.985 --> 00:16:07.845 is afebrile, but the pediatrician

NOTE Confidence: 0.98603594

00:16:07.904 --> 00:16:08.805 suspects dehydration.

NOTE Confidence: 0.9930277

00:16:09.585 --> 00:16:11.025 On physical exam, he appears

NOTE Confidence: 0.9930277

00:16:11.025 --> 00:16:12.385 agitated and is unable to

NOTE Confidence: 0.9930277

00:16:12.385 --> 00:16:13.125 lay flat.

NOTE Confidence: 0.9892546

00:16:13.505 --> 00:16:14.225 You do not hear a

NOTE Confidence: 0.9892546

00:16:14.225 --> 00:16:15.665 murmur or any abnormal lung

NOTE Confidence: 0.9892546

00:16:15.665 --> 00:16:16.165 sounds.

NOTE Confidence: 0.9940486

00:16:16.625 --> 00:16:18.245 Vital signs are as shown.

NOTE Confidence: 0.96367276

00:16:18.625 --> 00:16:19.985 How would you interpret the

NOTE Confidence: 0.96367276

00:16:19.985 --> 00:16:21.360 following focus images?