WEBVTT

NOTE duration:"00:35:59.5520000"

NOTE language:en-us

NOTE Confidence: 0.97357494

00:00:06.130 --> 00:00:08.734 OK, so now that we have pneumothorax

NOTE Confidence: 0.97357494

00:00:08.734 --> 00:00:10.968 and pleural effusion under our belts,

NOTE Confidence: 0.97357494

00:00:10.970 --> 00:00:13.578 we will move on to lung pocus for

NOTE Confidence: 0.97357494

00:00:13.578 --> 00:00:15.421 pediatric pneumonia and pearls and

NOTE Confidence: 0.97357494

00:00:15.421 --> 00:00:17.671 pitfalls necessary to be able to

NOTE Confidence: 0.97357494

00:00:17.671 --> 00:00:19.728 differentiate this entity from other

NOTE Confidence: 0.97357494

00:00:19.728 --> 00:00:21.743 causes of lower airway inflammation.

NOTE Confidence: 0.98510724

00:00:23.990 --> 00:00:26.678 So one of the challenges for us

NOTE Confidence: 0.98510724

00:00:26.678 --> 00:00:28.320 clinicians in diagnosing pediatric

NOTE Confidence: 0.98510724

00:00:28.320 --> 00:00:30.410 pneumonia is that the physical

NOTE Confidence: 0.98510724

00:00:30.410 --> 00:00:32.980 exam has an inherent limitations.

NOTE Confidence: 0.98510724

00:00:32.980 --> 00:00:35.422 In order for us to accurately

NOTE Confidence: 0.98510724

00:00:35.422 --> 00:00:37.050 differentiate other causes of

NOTE Confidence: 0.98510724

00:00:37.122 --> 00:00:39.397 lower airway disease in children.

1

NOTE Confidence: 0.98510724

00:00:39.400 --> 00:00:41.524 And this is nicely described in

NOTE Confidence: 0.98510724

00:00:41.524 --> 00:00:43.474 the JAMA 2017 Rational clinical

NOTE Confidence: 0.98510724

00:00:43.474 --> 00:00:45.334 Examination Systematic Review series

NOTE Confidence: 0.98510724

00:00:45.334 --> 00:00:48.390 on the topic of pediatric pneumonia.

NOTE Confidence: 0.98510724

00:00:48.390 --> 00:00:51.603 And so using an infiltrate on chest X ray

NOTE Confidence: 0.98510724

00:00:51.603 --> 00:00:55.300 as a reference standard for this diagnosis.

NOTE Confidence: 0.98510724

00:00:55.300 --> 00:00:57.868 There was no single finding that

NOTE Confidence: 0.98510724

00:00:57.868 --> 00:00:59.152 could reliably differentiate

NOTE Confidence: 0.98510724

00:00:59.152 --> 00:01:01.409 pneumonia from other causes of

NOTE Confidence: 0.98510724

00:01:01.409 --> 00:01:02.729 childhood respiratory illness.

NOTE Confidence: 0.98510724

00:01:02.730 --> 00:01:05.454 While two of the least important

NOTE Confidence: 0.98510724

00:01:05.454 --> 00:01:07.270 predictors included tachypnoea and

NOTE Confidence: 0.98510724

00:01:07.345 --> 00:01:09.715 lung findings on the physical exam.

NOTE Confidence: 0.9612918

00:01:12.270 --> 00:01:15.084 So this JAMA report is really eye

NOTE Confidence: 0.9612918

00:01:15.084 --> 00:01:17.623 opening because it really puts into

NOTE Confidence: 0.9612918

00:01:17.623 --> 00:01:20.125 question how much time we should

NOTE Confidence: 0.9612918

00:01:20.125 --> 00:01:22.902 even be spending on a lung exam

NOTE Confidence: 0.9612918

00:01:22.902 --> 00:01:25.214 using a stethoscope as opposed to

NOTE Confidence: 0.9612918

00:01:25.214 --> 00:01:27.199 harnessing our skills to perform

NOTE Confidence: 0.9612918

00:01:27.199 --> 00:01:29.716 high quality lung pocus exams with

NOTE Confidence: 0.9612918

00:01:29.716 --> 00:01:31.801 a general awareness of potential

NOTE Confidence: 0.9612918

00:01:31.801 --> 00:01:34.137 limitations of this modality as well.

NOTE Confidence: 0.9795054

00:01:37.640 --> 00:01:40.784 So if you look at what's been published

NOTE Confidence: 0.9795054

00:01:40.784 --> 00:01:44.384 in terms of lung ultrasound for the

NOTE Confidence: 0.9795054

00:01:44.384 --> 00:01:46.568 diagnosis of childhood pneumonia,

NOTE Confidence: 0.9795054

00:01:46.570 --> 00:01:49.860 the findings to date are very encouraging.

NOTE Confidence: 0.9795054

00:01:49.860 --> 00:01:52.464 We have meta analysis data published

NOTE Confidence: 0.9795054

00:01:52.464 --> 00:01:55.785 from 2015 and the Journal of Pediatrics

NOTE Confidence: 0.9795054

00:01:55.785 --> 00:01:58.785 in which they evaluated 8 studies,

NOTE Confidence: 0.9795054

00:01:58.790 --> 00:02:01.592 of which five used highly skilled

NOTE Confidence: 0.9795054

00:02:01.592 --> 00:02:03.460 operators with experience in

NOTE Confidence: 0.9795054

00:02:03.538 --> 00:02:05.948 long ultrasound in 765 children.

NOTE Confidence: 0.9795054

00:02:05.950 --> 00:02:07.662 Lung point of care.

NOTE Confidence: 0.9795054

00:02:07.662 --> 00:02:09.374 Ultrasound had a sensitivity

NOTE Confidence: 0.9795054

00:02:09.374 --> 00:02:11.938 of 96% and specificity of 93%

NOTE Confidence: 0.9795054

00:02:11.938 --> 00:02:13.646 to detect pediatric pneumonia.

NOTE Confidence: 0.9795054

00:02:13.650 --> 00:02:14.934 All studies incorporated

NOTE Confidence: 0.9795054

00:02:14.934 --> 00:02:17.502 the use of the linear probe.

NOTE Confidence: 0.9795054

00:02:17.510 --> 00:02:19.390 However, the reference standard

NOTE Confidence: 0.9795054

00:02:19.390 --> 00:02:21.740 did have some heterogeneity as

NOTE Confidence: 0.9795054

00:02:21.740 --> 00:02:24.381 some studies used at chest X ray

NOTE Confidence: 0.9795054

00:02:24.381 --> 00:02:26.490 alone as the criterion standard,

NOTE Confidence: 0.9795054

00:02:26.490 --> 00:02:28.555 while others incorporated both clinical

NOTE Confidence: 0.9795054

00:02:28.555 --> 00:02:31.200 findings with chest X ray results.

NOTE Confidence: 0.97423625

00:02:33.760 --> 00:02:36.294 So with the linear probe you will

NOTE Confidence: 0.97423625

00:02:36.294 --> 00:02:38.405 perform a rapid assessment to

NOTE Confidence: 0.97423625

00:02:38.405 --> 00:02:40.780 interrogate all six lung zones.

NOTE Confidence: 0.97423625

00:02:40.780 --> 00:02:43.108 He would start with the probe

NOTE Confidence: 0.97423625

00:02:43.108 --> 00:02:45.137 and the Midclavicular line and

NOTE Confidence: 0.97423625

00:02:45.137 --> 00:02:47.549 the anterior lung field with the

NOTE Confidence: 0.97423625

00:02:47.549 --> 00:02:49.869 indicator towards the patient's head,

NOTE Confidence: 0.97423625

00:02:49.870 --> 00:02:51.518 and slide the transducer

NOTE Confidence: 0.97423625

00:02:51.518 --> 00:02:53.166 down towards the diaphragm,

NOTE Confidence: 0.97423625

00:02:53.170 --> 00:02:56.158 and you're going to repeat these

NOTE Confidence: 0.97423625

00:02:56.158 --> 00:02:58.150 motions in the midaxillary

NOTE Confidence: 0.97423625

00:02:58.238 --> 00:03:01.311 line as shown and again to the

NOTE Confidence: 0.97423625

00:03:01.311 --> 00:03:03.390 posterior lung fields like so.

NOTE Confidence: 0.97423625

00:03:03.390 --> 00:03:04.820 And you would repeat on

NOTE Confidence: 0.97423625

00:03:04.820 --> 00:03:05.678 the contralateral side.

NOTE Confidence: 0.97971135

00:03:08.360 --> 00:03:09.850 Now for the most part,

NOTE Confidence: 0.97971135

00:03:09.850 --> 00:03:11.674 if everything looks normal on the

NOTE Confidence: 0.97971135

00:03:11.674 --> 00:03:13.791 monitor and you're seeing good at a

NOTE Confidence: 0.97971135

00:03:13.791 --> 00:03:15.206 lines with this agile orientation,

NOTE Confidence: 0.97971135

00:03:15.210 --> 00:03:17.594 you can move on to the next zone.

NOTE Confidence: 0.97971135

00:03:17.600 --> 00:03:18.965 That said, when something jumps

NOTE Confidence: 0.97971135

00:03:18.965 --> 00:03:20.880 out at me as being abnormal,

NOTE Confidence: 0.97971135

00:03:20.880 --> 00:03:23.256 such as a break in the pleural line,

NOTE Confidence: 0.97971135

00:03:23.260 --> 00:03:24.448 or perhaps there's the

NOTE Confidence: 0.97971135

00:03:24.448 --> 00:03:25.636 start of some beelines,

NOTE Confidence: 0.97971135

00:03:25.640 --> 00:03:27.565 I will at this point rotate the

NOTE Confidence: 0.97971135

00:03:27.565 --> 00:03:29.705 probe on that same spot to change

NOTE Confidence: 0.97971135

00:03:29.705 --> 00:03:31.577 the angle of insulation and try

NOTE Confidence: 0.97971135

00:03:31.641 --> 00:03:33.692 to get a good overall picture as

NOTE Confidence: 0.97971135

00:03:33.692 --> 00:03:35.672 to what's going on in this area

NOTE Confidence: 0.97971135

00:03:35.672 --> 00:03:38.020 of the lung that has an abnormal.

NOTE Confidence: 0.97971135

00:03:38.020 --> 00:03:42.498 Finding so let's start by taking a look

NOTE Confidence: 0.97971135

00:03:42.498 --> 00:03:45.260 at what normal lung ultrasound looks like.

NOTE Confidence: 0.97971135

00:03:45.260 --> 00:03:46.656 Air, as you know,

NOTE Confidence: 0.97971135

00:03:46.656 --> 00:03:48.750 is a poor transmitter of ultrasound,

NOTE Confidence: 0.97971135

00:03:48.750 --> 00:03:50.495 so we're not really seeing

NOTE Confidence: 0.97971135

00:03:50.495 --> 00:03:52.240 lung tissue on the screen,

NOTE Confidence: 0.97971135

00:03:52.240 --> 00:03:54.316 but rather the artifacts that are

NOTE Confidence: 0.97971135

00:03:54.316 --> 00:03:56.799 created by the interface of the pleura

NOTE Confidence: 0.97971135

00:03:56.799 --> 00:03:58.869 with airfield alviola right behind it.

NOTE Confidence: 0.97971135

00:03:58.870 --> 00:04:01.454 So in this example you have a ping

NOTE Confidence: 0.97971135

00:04:01.454 --> 00:04:03.352 pong effect from the ultrasound

NOTE Confidence: 0.97971135

00:04:03.352 --> 00:04:05.710 beam as it directs that first

NOTE Confidence: 0.97971135

00:04:05.710 --> 00:04:08.074 bright line in the center of the

NOTE Confidence: 0.97971135

00:04:08.074 --> 00:04:09.824 screen which is the pleura.

NOTE Confidence: 0.97971135

00:04:09.824 --> 00:04:13.212 And this ping pong effect will cause

NOTE Confidence: 0.97971135

00:04:13.212 --> 00:04:15.499 reverberation artifacts known as a

NOTE Confidence: 0.97971135

00:04:15.499 --> 00:04:17.564 lines that are essentially equidistant

NOTE Confidence: 0.97971135

00:04:17.564 --> 00:04:20.462 from the distance between the probe on

NOTE Confidence: 0.97971135

00:04:20.462 --> 00:04:23.218 the patient's chest to the plural line.

NOTE Confidence: 0.97971135

00:04:23.218 --> 00:04:25.492 And the reason for these equidistant

NOTE Confidence: 0.97971135

00:04:25.492 --> 00:04:28.508 lines is really the well known formula

NOTE Confidence: 0.97971135

00:04:28.508 --> 00:04:30.698 distance equals velocity times times.

NOTE Confidence: 0.97971135

00:04:30.700 --> 00:04:32.755 So the ultrasound beam velocity

NOTE Confidence: 0.97971135

00:04:32.755 --> 00:04:33.988 is a constant,

NOTE Confidence: 0.97971135

00:04:33.990 --> 00:04:36.510 so it changes is how long it

NOTE Confidence: 0.97971135

00:04:36.510 --> 00:04:38.734 takes for the ultrasound beam

NOTE Confidence: 0.97971135

00:04:38.734 --> 00:04:41.369 to travel to get reflected.

NOTE Confidence: 0.97971135

00:04:41.370 --> 00:04:42.405 Of the pleura.

NOTE Confidence: 0.97971135

00:04:42.405 --> 00:04:44.820 Depending on the size of the chest

NOTE Confidence: 0.97971135

00:04:44.898 --> 00:04:47.068 wall and the age of the patient

NOTE Confidence: 0.97971135

00:04:47.068 --> 00:04:49.480 and so these a lines that are

NOTE Confidence: 0.97971135

00:04:49.480 --> 00:04:51.592 created behind the pleura are the

NOTE Confidence: 0.97971135

00:04:51.600 --> 00:04:53.310 same distance from one another.

NOTE Confidence: 0.97971135

00:04:53.310 --> 00:04:55.838 So the important point here is that a

NOTE Confidence: 0.97971135

00:04:55.838 --> 00:04:58.760 lines are good and normal and reflect well.

NOTE Confidence: 0.97971135

00:04:58.760 --> 00:05:00.686 Aerated healthy lung tissue and the

NOTE Confidence: 0.97971135

00:05:00.686 --> 00:05:03.110 absence of a lines tends to signal

NOTE Confidence: 0.97971135

00:05:03.110 --> 00:05:04.895 some pathology within the lungs.

NOTE Confidence: 0.93803996

00:05:07.260 --> 00:05:09.772 So in contrast, B lines are bad and

NOTE Confidence: 0.93803996

00:05:09.772 --> 00:05:12.967 they are actually created by a different

NOTE Confidence: 0.93803996

00:05:12.967 --> 00:05:14.963 type of reverberation artifact.

NOTE Confidence: 0.93803996

00:05:14.970 --> 00:05:17.406 But the lines are a reverberation

NOTE Confidence: 0.93803996

00:05:17.406 --> 00:05:18.218 artifact nonetheless.

NOTE Confidence: 0.93803996

00:05:18.220 --> 00:05:20.410 So what tends to happen here

NOTE Confidence: 0.93803996

00:05:20.410 --> 00:05:23.294 is that when you have wet lung

NOTE Confidence: 0.93803996

00:05:23.294 --> 00:05:25.524 or fluid filled alveolar sacs,

NOTE Confidence: 0.93803996

00:05:25.530 --> 00:05:28.152 the ultrasound beam gets trapped within

NOTE Confidence: 0.93803996

00:05:28.152 --> 00:05:30.737 these fluid filled bubbles and the

NOTE Confidence: 0.93803996

00:05:30.737 --> 00:05:33.041 ping pong effect rather than occurring

NOTE Confidence: 0.93803996

00:05:33.041 --> 00:05:35.267 between the probe and the pleura,

NOTE Confidence: 0.93803996

00:05:35.270 --> 00:05:36.521 actually happens within.

NOTE Confidence: 0.93803996

00:05:36.521 --> 00:05:38.606 The inflamed and fluid filled

NOTE Confidence: 0.93803996

00:05:38.606 --> 00:05:39.440 alveoli instead,

NOTE Confidence: 0.93803996

00:05:39.440 --> 00:05:42.500 and so the images that is created is a

NOTE Confidence: 0.93803996

00:05:42.500 --> 00:05:45.556 series of tightly packed horizontal lines,

NOTE Confidence: 0.93803996

00:05:45.560 --> 00:05:49.360 one on top of the other that dive all the

NOTE Confidence: 0.93803996

00:05:49.462 --> 00:05:52.894 way down to the bottom of the screen,

NOTE Confidence: 0.93803996

00:05:52.900 --> 00:05:55.258 and as beelines become more diffuse

NOTE Confidence: 0.93803996

00:05:55.258 --> 00:05:57.799 and more prominent on your monitor,

NOTE Confidence: 0.93803996

00:05:57.800 --> 00:06:00.328 this is going to be linked with a

NOTE Confidence: 0.93803996

00:06:00.328 --> 00:06:02.764 more severe process of interstitial

NOTE Confidence: 0.93803996

00:06:02.764 --> 00:06:03.916 alveolar disease.

NOTE Confidence: 0.96507794

00:06:06.400 --> 00:06:08.976 OK, so here we have some examples

NOTE Confidence: 0.96507794

00:06:08.976 --> 00:06:10.804 of abnormal findings by lung

NOTE Confidence: 0.96507794

00:06:10.804 --> 00:06:13.093 ultrasound in the clip on the left

NOTE Confidence: 0.96507794

00:06:13.093 --> 00:06:15.399 using high frequency linear probe,

NOTE Confidence: 0.96507794

00:06:15.400 --> 00:06:18.064 you're able to see a series of the

NOTE Confidence: 0.96507794

00:06:18.064 --> 00:06:20.540 lines that are all diving down to

NOTE Confidence: 0.96507794

00:06:20.540 --> 00:06:23.215 the bottom of the screen which are

NOTE Confidence: 0.96507794

00:06:23.215 --> 00:06:25.789 starting from one area of confluence

NOTE Confidence: 0.96507794

00:06:25.789 --> 00:06:28.074 between two rib spaces on the

NOTE Confidence: 0.96507794

00:06:28.074 --> 00:06:30.678 pleura and on the right sided video

NOTE Confidence: 0.96507794

00:06:30.678 --> 00:06:33.380 clip you can see beelines as would

NOTE Confidence: 0.96507794

00:06:33.380 --> 00:06:35.829 be created using a phased array.

NOTE Confidence: 0.96507794

00:06:35.830 --> 00:06:36.704 Transducer again,

NOTE Confidence: 0.96507794

00:06:36.704 --> 00:06:38.452 these tightly packed horizontal

NOTE Confidence: 0.96507794

00:06:38.452 --> 00:06:40.200 reverberation artifacts can be

NOTE Confidence: 0.96507794

00:06:40.262 --> 00:06:41.907 seen to dive all the way down

NOTE Confidence: 0.96507794

00:06:41.907 --> 00:06:43.785 to the bottom of the screen and

NOTE Confidence: 0.96507794

00:06:43.785 --> 00:06:45.459 there are no clear lines visible,

NOTE Confidence: 0.96507794

00:06:45.460 --> 00:06:47.539 so this pattern would always be abnormal

NOTE Confidence: 0.96507794

00:06:47.539 --> 00:06:49.309 when performing a lung ultrasound.

NOTE Confidence: 0.9344359

00:06:51.960 --> 00:06:54.298 So when we think about diagnosing lung

NOTE Confidence: 0.9344359

00:06:54.298 --> 00:06:56.560 alter sound by pony culture sound,

NOTE Confidence: 0.9344359

00:06:56.560 --> 00:06:58.690 there is a spectrum of findings.

NOTE Confidence: 0.9344359

00:06:58.690 --> 00:07:00.640 Some of the earlier findings would

NOTE Confidence: 0.9344359

00:07:00.640 --> 00:07:02.930 be the presence of Beelines alone,

NOTE Confidence: 0.9344359

00:07:02.930 --> 00:07:04.902 and these can be.

NOTE Confidence: 0.9344359

00:07:04.902 --> 00:07:07.367 Differentiated into isolated versus conflict,

NOTE Confidence: 0.9344359

00:07:07.370 --> 00:07:10.256 with confluent being a more concerning

NOTE Confidence: 0.9344359

00:07:10.256 --> 00:07:13.441 finding and you want to just train

NOTE Confidence: 0.9344359

00:07:13.441 --> 00:07:15.787 yourself to be a good detective

NOTE Confidence: 0.9344359

00:07:15.787 --> 00:07:18.837 of pleural changes so you will

NOTE Confidence: 0.9344359

00:07:18.837 --> 00:07:21.407 become accustomed to disruptions of

NOTE Confidence: 0.9344359

00:07:21.410 --> 00:07:24.014 the pleural line being a possible

NOTE Confidence: 0.9344359

00:07:24.014 --> 00:07:26.285 early end concerning finding to

NOTE Confidence: 0.9344359

00:07:26.285 --> 00:07:28.133 suggest underlying pneumonia and

NOTE Confidence: 0.9344359

00:07:28.133 --> 00:07:30.443 finally with these plural line

NOTE Confidence: 0.9344359

00:07:30.517 --> 00:07:33.547 disruptions you can have small sub

NOTE Confidence: 0.9344359

00:07:33.547 --> 00:07:35.062 centimeter subpleural lesions.

NOTE Confidence: 0.9344359

00:07:35.070 --> 00:07:37.715 Or collections which are unfortunately

NOTE Confidence: 0.9344359

00:07:37.715 --> 00:07:39.831 nonspecific and could reflect

NOTE Confidence: 0.9344359

00:07:39.831 --> 00:07:42.228 either atelectasis or the start

NOTE Confidence: 0.9344359

00:07:42.228 --> 00:07:44.024 of a infiltrative process.

NOTE Confidence: 0.9464293

00:07:46.440 --> 00:07:49.030 So here we have a 2 year old boy with

NOTE Confidence: 0.9464293

00:07:49.100 --> 00:07:52.040 bronchiolitis and reactive airway disease.

NOTE Confidence: 0.9464293

00:07:52.040 --> 00:07:54.721 You can see over the center of

NOTE Confidence: 0.9464293

00:07:54.721 --> 00:07:57.323 the screen there is a small divot

NOTE Confidence: 0.9464293

00:07:57.323 --> 00:07:59.870 and a dip in that pleural line,

NOTE Confidence: 0.9464293

00:07:59.870 --> 00:08:01.880 so although this would potentially

NOTE Confidence: 0.9464293

00:08:01.880 --> 00:08:04.576 some lower airway process we should not

13

NOTE Confidence: 0.9464293

00:08:04.576 --> 00:08:06.725 be using this finding alone to make

NOTE Confidence: 0.9464293

00:08:06.725 --> 00:08:08.680 a diagnosis of pediatric pneumonia

NOTE Confidence: 0.9464293

00:08:08.680 --> 00:08:11.432 by long ultrasound as this is a

NOTE Confidence: 0.9464293

00:08:11.432 --> 00:08:13.664 very mild and non specific finding.

NOTE Confidence: 0.9250729

00:08:16.800 --> 00:08:19.260 These following clips show and additional.

NOTE Confidence: 0.9250729

00:08:19.260 --> 00:08:21.310 I would say progression of

NOTE Confidence: 0.9250729

00:08:21.310 --> 00:08:22.950 the spectrum of findings.

NOTE Confidence: 0.9250729

00:08:22.950 --> 00:08:26.420 So on the 1st clip on the left hand side

NOTE Confidence: 0.9250729

00:08:26.511 --> 00:08:30.021 there is a linear probe and you can see

NOTE Confidence: 0.9250729

00:08:30.021 --> 00:08:33.197 again disruption of the pleural line.

NOTE Confidence: 0.9250729

00:08:33.200 --> 00:08:36.712 We would call this an isolated beeline focus

NOTE Confidence: 0.9250729

00:08:36.712 --> 00:08:39.755 emanating from the same spot in the pleura.

NOTE Confidence: 0.9250729

00:08:39.760 --> 00:08:43.120 These are tough because they could reflect

NOTE Confidence: 0.9250729

00:08:43.120 --> 00:08:45.520 early pneumonia versus atelectasis.

NOTE Confidence: 0.9250729

00:08:45.520 --> 00:08:49.462 On the clip on the right hand side you

NOTE Confidence: 0.9250729

00:08:49.462 --> 00:08:53.968 can see a greater confluence of the lines,

NOTE Confidence: 0.9250729

00:08:53.970 --> 00:08:56.450 which again are arising from

NOTE Confidence: 0.9250729

00:08:56.450 --> 00:08:58.434 a single subpleural focus.

NOTE Confidence: 0.9250729

00:08:58.440 --> 00:09:01.646 What I would typically do here is

NOTE Confidence: 0.9250729

00:09:01.646 --> 00:09:05.239 rotate the probe 360 degrees to see

NOTE Confidence: 0.9250729

00:09:05.239 --> 00:09:07.889 if there are additional findings,

NOTE Confidence: 0.9250729

00:09:07.890 --> 00:09:10.452 such as air bronchograms or other

NOTE Confidence: 0.9250729

00:09:10.452 --> 00:09:13.350 signs of nearby lung consolidation.

NOTE Confidence: 0.97704875

00:09:15.880 --> 00:09:17.605 So here's a good example

NOTE Confidence: 0.97704875

00:09:17.605 --> 00:09:19.330 of what I'm talking about.

NOTE Confidence: 0.97704875

00:09:19.330 --> 00:09:22.074 This is a 5 year old with right

NOTE Confidence: 0.97704875

00:09:22.074 --> 00:09:24.375 upper lobe pneumonia as diagnosed

NOTE Confidence: 0.97704875

00:09:24.375 --> 00:09:27.429 by lung point of care ultrasound.

NOTE Confidence: 0.97704875

00:09:27.430 --> 00:09:28.738 With an essentially

NOTE Confidence: 0.97704875

00:09:28.738 --> 00:09:30.918 unremarkable X-ray at the time,

NOTE Confidence: 0.97704875

00:09:30.920 --> 00:09:33.517 you can see where the arrow is

NOTE Confidence: 0.97704875

00:09:33.517 --> 00:09:36.150 placed on the ultrasound image.

NOTE Confidence: 0.97704875

00:09:36.150 --> 00:09:38.652 There is a confluence of the

NOTE Confidence: 0.97704875

00:09:38.652 --> 00:09:40.950 lines emanating from the pleura.

NOTE Confidence: 0.97704875

00:09:40.950 --> 00:09:43.694 As this image is obtained over the

NOTE Confidence: 0.97704875

00:09:43.694 --> 00:09:45.950 posterior upper lung zone and here

NOTE Confidence: 0.97704875

00:09:45.950 --> 00:09:48.295 there is a lesion which is bigger

NOTE Confidence: 0.97704875

00:09:48.370 --> 00:09:51.355 than one centimeter that represents

NOTE Confidence: 0.97704875

00:09:51.355 --> 00:09:53.146 potential aspiration pneumonia.

NOTE Confidence: 0.97704875

00:09:53.150 --> 00:09:55.190 That clinically was patient

NOTE Confidence: 0.97704875

00:09:55.190 --> 00:09:58.250 had some risk factors for so.

NOTE Confidence: 0.97704875

00:09:58.250 --> 00:10:00.308 Although the X ray was unremarkable,

NOTE Confidence: 0.97704875

00:10:00.310 --> 00:10:02.620 we did initiate a course of augmentin

NOTE Confidence: 0.97704875

00:10:02.620 --> 00:10:05.126 and I happened to call the mom the next

NOTE Confidence: 0.97704875

00:10:05.126 --> 00:10:07.563 day or so who reported improved fever

NOTE Confidence: 0.97704875

00:10:07.563 --> 00:10:09.903 and also improved worker breathing.

NOTE Confidence: 0.97704875

00:10:09.910 --> 00:10:12.003 So we were pretty happy with this

NOTE Confidence: 0.97704875

00:10:12.003 --> 00:10:14.333 outcome that we were able to use

NOTE Confidence: 0.97704875

00:10:14.333 --> 00:10:16.385 ultrasound to augment our physical exam

NOTE Confidence: 0.97704875

00:10:16.447 --> 00:10:18.829 to provide the best possible treatment.

NOTE Confidence: 0.97704875

00:10:18.830 --> 00:10:20.198 Recommendations for this family.

NOTE Confidence: 0.9551262

00:10:23.070 --> 00:10:25.374 And so here in this patient it was

NOTE Confidence: 0.9551262

00:10:25.374 --> 00:10:28.422 a five week old with the left upper

NOTE Confidence: 0.9551262

00:10:28.422 --> 00:10:30.730 lobe infiltrate as diagnosed by X-ray.

NOTE Confidence: 0.9551262

00:10:30.730 --> 00:10:32.818 And you can see on ultrasound

NOTE Confidence: 0.9551262

00:10:32.818 --> 00:10:34.210 with the linear probe.

NOTE Confidence: 0.9551262

00:10:34.210 --> 00:10:36.220 There are confluent be lines

NOTE Confidence: 0.9551262

00:10:36.220 --> 00:10:38.230 which are spanning across multiple

NOTE Confidence: 0.9551262

00:10:38.297 --> 00:10:40.481 rib spaces so that it's not just

NOTE Confidence: 0.9551262

00:10:40.481 --> 00:10:42.426 emanating from a single focus or

NOTE Confidence: 0.9551262

00:10:42.426 --> 00:10:44.298 a single area of the pleura.

NOTE Confidence: 0.9551262

00:10:44.300 --> 00:10:46.519 And so this pattern where there is

NOTE Confidence: 0.9551262

00:10:46.519 --> 00:10:48.661 a larger area of lung involvement

NOTE Confidence: 0.9551262

00:10:48.661 --> 00:10:50.905 is of course a more concerning.

NOTE Confidence: 0.9551262

00:10:50.910 --> 00:10:52.482 Finding requires careful interpretation.

NOTE Confidence: 0.9551262

00:10:52.482 --> 00:10:54.054 And judicious next steps,

NOTE Confidence: 0.9551262

00:10:54.060 --> 00:10:56.937 especially in a patient that's so young.

NOTE Confidence: 0.9551262

00:10:56.940 --> 00:10:59.358 So if these findings are diffused

NOTE Confidence: 0.9551262

00:10:59.358 --> 00:11:01.470 and seen to all long,

NOTE Confidence: 0.9551262

00:11:01.470 --> 00:11:04.564 then I would interpret as bronchiolitis or

NOTE Confidence: 0.9551262

00:11:04.564 --> 00:11:06.830 diffuse multifocal pneumonia as opposed to.

NOTE Confidence: 0.9551262

00:11:06.830 --> 00:11:09.707 In this case it was a symmetric.

NOTE Confidence: 0.9551262

00:11:09.710 --> 00:11:12.657 So this would suggest some more focal

NOTE Confidence: 0.9551262

00:11:12.657 --> 00:11:15.669 process of lung tissue consolidation.

NOTE Confidence: 0.9551262

00:11:15.670 --> 00:11:17.775 Here is another example using

NOTE Confidence: 0.9551262

00:11:17.775 --> 00:11:19.038 a curvilinear probe.

NOTE Confidence: 0.9551262

00:11:19.040 --> 00:11:21.326 As this patient is having an

NOTE Confidence: 0.9551262

00:11:21.326 --> 00:11:23.836 assessment of the loan basis for

NOTE Confidence: 0.9551262

00:11:23.836 --> 00:11:26.566 likely for a pleural effusion X-ray

NOTE Confidence: 0.9551262

00:11:26.566 --> 00:11:29.204 consistent with the right middle lobe

NOTE Confidence: 0.9551262

00:11:29.204 --> 00:11:33.530 infiltrate and you can once again see.

NOTE Confidence: 0.9551262

00:11:33.530 --> 00:11:35.355 Confluent felines spanning multiple rib

NOTE Confidence: 0.9551262

00:11:35.355 --> 00:11:37.780 spaces in this patient with pneumonia.

NOTE Confidence: 0.9551262

00:11:37.780 --> 00:11:40.090 So the tradeoff here is penetration

NOTE Confidence: 0.9551262

00:11:40.090 --> 00:11:40.860 for resolution.

NOTE Confidence: 0.9551262

00:11:40.860 --> 00:11:43.219 This is a cover linear probe eval

NOTE Confidence: 0.9551262

00:11:43.219 --> 00:11:45.499 probably for a pleural effusion,

NOTE Confidence: 0.9551262

00:11:45.500 --> 00:11:46.968 which is not present.

NOTE Confidence: 0.9551262

00:11:46.968 --> 00:11:49.630 So although we don't see the pleura

NOTE Confidence: 0.9551262

00:11:49.630 --> 00:11:52.304 as large and as crisply as we've

NOTE Confidence: 0.9551262

00:11:52.304 --> 00:11:54.759 been viewing with the linear probe,

NOTE Confidence: 0.9551262

00:11:54.760 --> 00:11:57.462 you can still get a sense that

NOTE Confidence: 0.9551262

00:11:57.462 --> 00:11:58.620 these be lines.

NOTE Confidence: 0.9551262

00:11:58.620 --> 00:12:01.105 Dip all the way down to the

NOTE Confidence: 0.9551262

00:12:01.105 --> 00:12:04.154 bottom of the screen, even when a.

NOTE Confidence: 0.9551262

00:12:04.154 --> 00:12:05.866 Lower frequency transducer is

NOTE Confidence: 0.9551262

00:12:05.866 --> 00:12:08.009 used to scan the lungs.

NOTE Confidence: 0.984748100000001

00:12:10.790 --> 00:12:12.992 And finally, here's a 6 year

NOTE Confidence: 0.984748100000001

00:12:12.992 --> 00:12:14.927 old drowning victim who arrived

NOTE Confidence: 0.984748100000001

00:12:14.927 --> 00:12:17.692 vomiting a pool water but was not

NOTE Confidence: 0.984748100000001

00:12:17.692 --> 00:12:20.107 intimidated at the time of this scan.

NOTE Confidence: 0.984748100000001

00:12:20.110 --> 00:12:22.312 You can see that there's diffuse

NOTE Confidence: 0.984748100000001

00:12:22.312 --> 00:12:24.510 beelines seen throughout all longfields,

NOTE Confidence: 0.984748100000001

00:12:24.510 --> 00:12:27.380 and so these are some extra findings

NOTE Confidence: 0.984748100000001

00:12:27.380 --> 00:12:29.514 on linear probe interrogation of

NOTE Confidence: 0.984748100000001

00:12:29.514 --> 00:12:32.794 the right lung in the left lung and

NOTE Confidence: 0.984748100000001

00:12:32.878 --> 00:12:35.782 the bee lines can be seen using the

NOTE Confidence: 0.984748100000001

00:12:35.782 --> 00:12:38.510 cardiac or phased array probe as well,

NOTE Confidence: 0.984748100000001

00:12:38.510 --> 00:12:40.470 although the beeline artifacts in

NOTE Confidence: 0.984748100000001

00:12:40.470 --> 00:12:42.903 this case actually stem from the

NOTE Confidence: 0.984748100000001

00:12:42.903 --> 00:12:44.928 diaphragm with otherwise good mirror

NOTE Confidence: 0.984748100000001

00:12:44.928 --> 00:12:47.310 imaging and no thoracic spine sign,

NOTE Confidence: 0.984748100000001

00:12:47.310 --> 00:12:49.440 so this would exclude pleural

NOTE Confidence: 0.984748100000001

00:12:49.440 --> 00:12:50.718 effusion or any.

NOTE Confidence: 0.984748100000001

00:12:50.720 --> 00:12:52.268 Lower lobe pneumonia in this area.

NOTE Confidence: 0.9839716

00:12:55.510 --> 00:12:58.867 And so here in the next set of images

NOTE Confidence: 0.9839716

00:12:58.867 --> 00:13:02.620 that we're going to look at will be

NOTE Confidence: 0.9839716

00:13:02.620 --> 00:13:05.370 more advanced findings for pneumonia,

NOTE Confidence: 0.9839716

00:13:05.370 --> 00:13:08.046 and so these include air bronchograms,

NOTE Confidence: 0.9839716

00:13:08.050 --> 00:13:12.628 which can either be static or dynamic.

NOTE Confidence: 0.9839716

00:13:12.630 --> 00:13:15.732 The presence of a shred sign, pleural,

NOTE Confidence: 0.9839716

00:13:15.732 --> 00:13:18.826 shred sign and hepatization of lung tissue.

NOTE Confidence: 0.96384454

00:13:22.070 --> 00:13:24.526 So in this three year old patient with

NOTE Confidence: 0.96384454

00:13:24.526 --> 00:13:26.717 left upper lobe pneumonia by X ray,

NOTE Confidence: 0.96384454

00:13:26.720 --> 00:13:29.240 which can be seen at pretty clearly

NOTE Confidence: 0.96384454

00:13:29.240 --> 00:13:31.920 on at the lateral projection.

NOTE Confidence: 0.96384454

00:13:31.920 --> 00:13:34.155 Lung ultrasound shows static air

NOTE Confidence: 0.96384454

00:13:34.155 --> 00:13:36.390 bronchograms which are created by

NOTE Confidence: 0.96384454

00:13:36.459 --> 00:13:38.559 these white punctate spots where

NOTE Confidence: 0.96384454

00:13:38.559 --> 00:13:41.079 you would otherwise expect to have

NOTE Confidence: 0.96384454

00:13:41.079 --> 00:13:43.543 a lines if there was normal aerated

NOTE Confidence: 0.96384454

00:13:43.543 --> 00:13:46.040 lung tissue and I really love this

NOTE Confidence: 0.96384454

00:13:46.040 --> 00:13:48.305 clip because you can see towards

NOTE Confidence: 0.96384454

00:13:48.305 --> 00:13:51.077 the left of the screen above the

NOTE Confidence: 0.96384454

00:13:51.077 --> 00:13:53.853 rib there's an area of multiple

NOTE Confidence: 0.96384454

00:13:53.853 --> 00:13:55.757 beelines with some confluence,

NOTE Confidence: 0.96384454

00:13:55.760 --> 00:13:58.144 which if I had seen that alone I

NOTE Confidence: 0.96384454

00:13:58.144 --> 00:14:00.722 would have been suspicious about

NOTE Confidence: 0.96384454

00:14:00.722 --> 00:14:01.996 surrounding atelectasis.

NOTE Confidence: 0.96384454

00:14:02.000 --> 00:14:03.908 Or lung tissue consolidation.

NOTE Confidence: 0.9547709

00:14:05.990 --> 00:14:08.186 A static or bronchograms can be

NOTE Confidence: 0.9547709

00:14:08.186 --> 00:14:10.489 tricky because they could be seen

NOTE Confidence: 0.9547709

00:14:10.489 --> 00:14:12.414 in both pneumonia and atelectasis,

NOTE Confidence: 0.9547709

00:14:12.420 --> 00:14:14.520 so you really have to correlate

NOTE Confidence: 0.9547709

00:14:14.520 --> 00:14:16.949 this finding to the clinical exam,

NOTE Confidence: 0.9547709

00:14:16.950 --> 00:14:19.362 and these are probably instances where

NOTE Confidence: 0.9547709

00:14:19.362 --> 00:14:22.618 you want to get a chest film as well,

NOTE Confidence: 0.9547709

00:14:22.620 --> 00:14:24.762 and together with the lung ultrasound you

NOTE Confidence: 0.9547709

00:14:24.762 --> 00:14:27.160 can make a more accurate interpretation

NOTE Confidence: 0.9547709

00:14:27.160 --> 00:14:29.804 of the ultrasound findings. In contrast,

NOTE Confidence: 0.9547709

00:14:29.804 --> 00:14:32.066 dynamic air bronchograms as seen here,

NOTE Confidence: 0.9547709

00:14:32.070 --> 00:14:34.338 which are reflected by fluid mucus,

NOTE Confidence: 0.9547709

00:14:34.340 --> 00:14:35.996 phlegm buildup within the

NOTE Confidence: 0.9547709

00:14:35.996 --> 00:14:37.238 bronchi and bronchioles.

NOTE Confidence: 0.9547709

00:14:37.240 --> 00:14:39.406 Are the most specific finding for

NOTE Confidence: 0.9547709

00:14:39.406 --> 00:14:41.570 pediatric pneumonia by lung ultrasound.

NOTE Confidence: 0.9547709

00:14:41.570 --> 00:14:43.540 However, the incidence of finding

NOTE Confidence: 0.9547709

00:14:43.540 --> 00:14:45.510 dinamico bronchograms is relatively low,

NOTE Confidence: 0.9547709

00:14:45.510 --> 00:14:48.350 but you can see here on this clip

NOTE Confidence: 0.9547709

00:14:48.350 --> 00:14:50.863 motion of the fluid filled bronchi

NOTE Confidence: 0.9547709

00:14:50.863 --> 00:14:54.288 and you can almost make out the airway

NOTE Confidence: 0.9547709

00:14:54.288 --> 00:14:57.328 tree and so this is a great example

NOTE Confidence: 0.9547709

00:14:57.330 --> 00:14:59.978 of what you would be looking for in

NOTE Confidence: 0.9547709

00:14:59.978 --> 00:15:01.987 terms of dynamic air bronchograms

NOTE Confidence: 0.9547709

00:15:01.987 --> 00:15:05.559 which have been found to be the most

NOTE Confidence: 0.9547709

00:15:05.559 --> 00:15:07.727 specific finding for pneumonia.

NOTE Confidence: 0.9547709

00:15:07.730 --> 00:15:10.238 Using lung ultrasound.

NOTE Confidence: 0.9547709

00:15:10.240 --> 00:15:13.584 Here we have a 6 year old with

NOTE Confidence: 0.9547709

00:15:13.584 --> 00:15:16.518 sickle cell disease and acute chest

NOTE Confidence: 0.9547709

00:15:16.518 --> 00:15:19.506 syndrome as seen by X ray.

NOTE Confidence: 0.9547709

24

00:15:19.510 --> 00:15:22.540 In order to have bibasilar airspace

NOTE Confidence: 0.9547709

00:15:22.540 --> 00:15:25.952 opacities and of course the differential

NOTE Confidence: 0.9547709

00:15:25.952 --> 00:15:29.207 would be pneumonia versus atelectasis

NOTE Confidence: 0.9547709

00:15:29.207 --> 00:15:33.129 versus vaso occlusive changes by ultrasound.

NOTE Confidence: 0.9547709

00:15:33.130 --> 00:15:35.638 You can see a pleural disruption

NOTE Confidence: 0.9547709

00:15:35.638 --> 00:15:38.797 and shred sign in both the right

NOTE Confidence: 0.9547709

00:15:38.797 --> 00:15:41.587 and the left posterior lung fields.

NOTE Confidence: 0.9547709

00:15:41.590 --> 00:15:44.260 The pathology on the right is

NOTE Confidence: 0.9547709

00:15:44.260 --> 00:15:45.150 somewhat smaller.

NOTE Confidence: 0.9547709

00:15:45.150 --> 00:15:47.992 Here you can see towards the right

NOTE Confidence: 0.9547709

00:15:47.992 --> 00:15:50.489 of the screen the diaphragm,

NOTE Confidence: 0.9547709

00:15:50.490 --> 00:15:53.376 the double line of the diaphragm

NOTE Confidence: 0.9547709

00:15:53.376 --> 00:15:57.134 with the liver right below it and you

NOTE Confidence: 0.9547709

00:15:57.134 --> 00:16:00.298 can see disruption and shred of the

NOTE Confidence: 0.9547709

00:16:00.298 --> 00:16:03.930 pleura with B lines that are diving down.

NOTE Confidence: 0.9547709

00:16:03.930 --> 00:16:06.378 From the pleural interface and so

NOTE Confidence: 0.9547709

00:16:06.378 --> 00:16:09.449 the lesion on the left is actually

NOTE Confidence: 0.9547709

00:16:09.449 --> 00:16:10.808 much much bigger.

NOTE Confidence: 0.9547709

00:16:10.810 --> 00:16:13.390 There you don't see that clear,

NOTE Confidence: 0.9547709

00:16:13.390 --> 00:16:15.110 crisp pleura that echogenic

NOTE Confidence: 0.9547709

00:16:15.110 --> 00:16:17.260 line between the rib spaces.

NOTE Confidence: 0.9547709

00:16:17.260 --> 00:16:19.410 Because there is tissue consolidation

NOTE Confidence: 0.9547709

00:16:19.410 --> 00:16:20.270 there instead.

NOTE Confidence: 0.9547709

00:16:20.270 --> 00:16:22.860 So the shred sign is actually far

NOTE Confidence: 0.9547709

00:16:22.860 --> 00:16:25.538 lower on the screen about where

NOTE Confidence: 0.9547709

00:16:25.538 --> 00:16:28.003 the four centimeter marker is,

NOTE Confidence: 0.9547709

00:16:28.010 --> 00:16:31.216 and this is correlated with the X

NOTE Confidence: 0.9547709

00:16:31.216 --> 00:16:34.118 ray that appeared to be far worse.

NOTE Confidence: 0.9547709

00:16:34.120 --> 00:16:35.828 On the left compared to the right.

NOTE Confidence: 0.94951075

00:16:39.430 --> 00:16:42.330 And here we have a 12 year old with asthma

NOTE Confidence: 0.94951075

00:16:42.401 --> 00:16:45.509 who also presented with respiratory distress,

NOTE Confidence: 0.94951075

00:16:45.510 --> 00:16:48.134 found to have pneumonia by X ray and

NOTE Confidence: 0.94951075

00:16:48.134 --> 00:16:51.210 on lung ultrasound. You can see a

NOTE Confidence: 0.94951075

00:16:51.210 --> 00:16:53.490 clear hepatization of the lung tissue.

NOTE Confidence: 0.94951075

00:16:53.490 --> 00:16:56.478 So the probe in this case is a phased

NOTE Confidence: 0.94951075

00:16:56.478 --> 00:16:59.356 array probe which is placed in the

NOTE Confidence: 0.94951075

00:16:59.356 --> 00:17:01.850 left anterior zone above the heart.

NOTE Confidence: 0.94951075

00:17:01.850 --> 00:17:05.002 As you can see on the ultrasound image

NOTE Confidence: 0.94951075

00:17:05.002 --> 00:17:08.259 the heart is beating on the right side.

NOTE Confidence: 0.94951075

00:17:08.260 --> 00:17:12.020 And what appears to be liver above it.

NOTE Confidence: 0.94951075

00:17:12.020 --> 00:17:14.932 But in fact this is diseased lung

NOTE Confidence: 0.94951075

00:17:14.932 --> 00:17:17.352 tissue which would be reflective

NOTE Confidence: 0.94951075

00:17:17.352 --> 00:17:19.536 of more advanced pneumonia.

NOTE Confidence: 0.94951075

00:17:19.540 --> 00:17:21.360 So lines are missing.

NOTE Confidence: 0.94951075

00:17:21.360 --> 00:17:24.090 And because the disease process is

NOTE Confidence: 0.94951075

00:17:24.173 --> 00:17:27.302 parenchymal and not solely at the level

NOTE Confidence: 0.94951075

00:17:27.302 --> 00:17:30.350 of the alveolae or the interstitium,

NOTE Confidence: 0.94951075

00:17:30.350 --> 00:17:34.110 you do not see any B lines on this image

NOTE Confidence: 0.94951075

00:17:34.209 --> 00:17:38.349 but just advanced lung tissue consolidation.

NOTE Confidence: 0.94951075

00:17:38.350 --> 00:17:40.815 Otherwise known as Hepatization because

NOTE Confidence: 0.94951075

00:17:40.815 --> 00:17:43.280 of the similarities in appearance

NOTE Confidence: 0.94951075

00:17:43.353 --> 00:17:45.621 when comparing this to the normal

NOTE Confidence: 0.94951075

00:17:45.621 --> 00:17:47.950 appearance of liver by ultrasound.

NOTE Confidence: 0.9257735

00:17:50.770 --> 00:17:53.976 So we don't know what the future

NOTE Confidence: 0.9257735

00:17:53.976 --> 00:17:56.819 impact of lung focus will be.

NOTE Confidence: 0.9257735

00:17:56.820 --> 00:18:00.068 I believe there are three potential outcomes,

NOTE Confidence: 0.9257735

00:18:00.070 --> 00:18:03.325 one with integration of the clinical exam.

NOTE Confidence: 0.9257735

00:18:03.330 --> 00:18:05.655 We hope that pediatric pneumonia

NOTE Confidence: 0.9257735

00:18:05.655 --> 00:18:07.980 diagnosis can become more reliable.

NOTE Confidence: 0.9257735

00:18:07.980 --> 00:18:10.476 Ideally, we can make a earlier

NOTE Confidence: 0.9257735

00:18:10.476 --> 00:18:12.768 diagnosis and reduce the overall

NOTE Confidence: 0.9257735

00:18:12.768 --> 00:18:14.948 burden of chest radiography.

NOTE Confidence: 0.9257735

00:18:14.950 --> 00:18:17.540 Another potential impact is over

NOTE Confidence: 0.9257735

00:18:17.540 --> 00:18:19.612 prescription of antibiotics as.

NOTE Confidence: 0.9257735

00:18:19.620 --> 00:18:23.180 There's no way to fees abli or reliably

NOTE Confidence: 0.9257735

00:18:23.180 --> 00:18:25.890 differentiate a viral pneumonia from

NOTE Confidence: 0.9257735

00:18:25.890 --> 00:18:28.775 a bacterial pneumonia by ultrasound.

NOTE Confidence: 0.9257735

00:18:28.780 --> 00:18:29.736 And finally,

NOTE Confidence: 0.9257735

00:18:29.736 --> 00:18:32.604 there's a possibility that we may

NOTE Confidence: 0.9257735

00:18:32.604 --> 00:18:34.889 actually prescribe less antibiotics.

NOTE Confidence: 0.9257735

00:18:34.890 --> 00:18:35.880 Given again,

NOTE Confidence: 0.9257735

00:18:35.880 --> 00:18:38.355 the limitations in the physical

NOTE Confidence: 0.9257735

00:18:38.355 --> 00:18:40.855 exam and lack of reliability

NOTE Confidence: 0.9257735

00:18:40.855 --> 00:18:43.621 that X ray has to differentiate

NOTE Confidence: 0.9257735

00:18:43.621 --> 00:18:46.599 a viral from bacterial process.

NOTE Confidence: 0.92602354

00:18:48.840 --> 00:18:51.896 So this would be an example of the

NOTE Confidence: 0.92602354

00:18:51.896 --> 00:18:53.422 first outcome, greater position

NOTE Confidence: 0.92602354

00:18:53.422 --> 00:18:54.946 and more accurate diagnosis.

NOTE Confidence: 0.92602354

00:18:54.950 --> 00:18:57.950 So 6 year old male with Hemoglobin SC

NOTE Confidence: 0.92602354

00:18:57.950 --> 00:19:00.587 presented with fever for two days and

NOTE Confidence: 0.92602354

00:19:00.587 --> 00:19:03.263 shortness of breath on exam had some

NOTE Confidence: 0.92602354

00:19:03.263 --> 00:19:05.645 slight elevation in the heart rate,

NOTE Confidence: 0.92602354

00:19:05.650 --> 00:19:07.765 but otherwise normal oxygen saturation

NOTE Confidence: 0.92602354

00:19:07.765 --> 00:19:09.880 exam with wheezing and diminished

NOTE Confidence: 0.92602354

00:19:09.939 --> 00:19:11.757 breath sounds on the left side.

NOTE Confidence: 0.92602354

00:19:11.760 --> 00:19:15.396 High typical work up was done for SC disease

NOTE Confidence: 0.92602354

00:19:15.396 --> 00:19:18.777 with fever to include a chest X ray and.

NOTE Confidence: 0.92602354

00:19:18.780 --> 00:19:21.370 Lab work which revealed no

NOTE Confidence: 0.92602354

00:19:21.370 --> 00:19:23.960 Leukocytosis on the X ray.

NOTE Confidence: 0.92602354

00:19:23.960 --> 00:19:26.045 There was no acute cardio

NOTE Confidence: 0.92602354

00:19:26.045 --> 00:19:27.713 thoracic abnormality as per

NOTE Confidence: 0.92602354

00:19:27.713 --> 00:19:30.180 the radiologist interpretation.

NOTE Confidence: 0.91635346

00:19:32.190 --> 00:19:35.683 However, by lung focus there is clear

NOTE Confidence: 0.91635346

00:19:35.683 --> 00:19:39.014 shred sign in the left posterior

NOTE Confidence: 0.91635346

00:19:39.014 --> 00:19:41.899 lung field with disruption of

NOTE Confidence: 0.91635346

00:19:41.899 --> 00:19:45.103 the pleura and beelines emanating

NOTE Confidence: 0.91635346

00:19:45.103 --> 00:19:48.343 from this jagged pleural edge.

NOTE Confidence: 0.91635346

00:19:48.350 --> 00:19:50.870 This patient was subsequently admitted

NOTE Confidence: 0.91635346

00:19:50.870 --> 00:19:53.390 with early recognition of acute

NOTE Confidence: 0.91635346

00:19:53.462 --> 00:19:56.178 chest on given ceftriaxone and is it

NOTE Confidence: 0.91635346

00:19:56.178 --> 00:19:58.910 through myosin as per our hematology

NOTE Confidence: 0.91635346

00:19:58.910 --> 00:20:00.398 treatment recommendations and

NOTE Confidence: 0.91635346

00:20:00.398 --> 00:20:02.842 incurred a three day hospitalization?

NOTE Confidence: 0.91635346

00:20:02.842 --> 00:20:05.554 How luckily did not require any

NOTE Confidence: 0.91635346

00:20:05.554 --> 00:20:07.953 PRBC transfusion and had multiple

NOTE Confidence: 0.91635346

00:20:07.953 --> 00:20:09.408 negative blood cultures.

NOTE Confidence: 0.91635346

00:20:09.410 --> 00:20:12.406 This case was several years before we

NOTE Confidence: 0.91635346

00:20:12.406 --> 00:20:14.793 were routinely obtaining procalcitonin to

NOTE Confidence: 0.91635346

00:20:14.793 --> 00:20:17.895 help rid stratified bacterial versus viral.

NOTE Confidence: 0.91635346

00:20:17.900 --> 00:20:20.014 Pneumonia and a viral swab is not

NOTE Confidence: 0.91635346

00:20:20.014 --> 00:20:21.928 performed as his patient was managed

NOTE Confidence: 0.91635346

00:20:21.928 --> 00:20:24.126 in the hospital who did well and

NOTE Confidence: 0.91635346

00:20:24.193 --> 00:20:26.338 completed his course for community

NOTE Confidence: 0.91635346

00:20:26.338 --> 00:20:28.483 acquired pneumonia as an outpatient.

NOTE Confidence: 0.97425926

00:20:31.220 --> 00:20:34.230 Here's another example of how we may

NOTE Confidence: 0.97425926

00:20:34.230 --> 00:20:37.130 provide more efficient care with lung pocus.

NOTE Confidence: 0.97425926

00:20:37.130 --> 00:20:39.240 So in this clinical case,

NOTE Confidence: 0.97425926

00:20:39.240 --> 00:20:41.766 a 9 month old presented with

NOTE Confidence: 0.97425926

00:20:41.766 --> 00:20:44.138 respiratory distress, and this was the

NOTE Confidence: 0.97425926

00:20:44.138 --> 00:20:47.260 3rd ER visit for the same illness.

NOTE Confidence: 0.97425926

00:20:47.260 --> 00:20:49.370 Had a prior rhinovirus positive

NOTE Confidence: 0.97425926

00:20:49.370 --> 00:20:51.480 tests in an X ray,

NOTE Confidence: 0.97425926

00:20:51.480 --> 00:20:53.412 which during the first visit was

NOTE Confidence: 0.97425926

00:20:53.412 --> 00:20:55.983 more in keeping with Perihilar and

NOTE Confidence: 0.97425926

00:20:55.983 --> 00:20:57.807 peribronchial interstitial markings,

NOTE Confidence: 0.97425926

00:20:57.810 --> 00:20:59.838 likely viral airway inflammation.

NOTE Confidence: 0.97425926

00:20:59.838 --> 00:21:01.723 Most likely bronchiolitis, however,

NOTE Confidence: 0.97425926

00:21:01.723 --> 00:21:03.538 ongoing fevers cough and some

NOTE Confidence: 0.97425926

00:21:03.538 --> 00:21:05.454 posts of emesis and increasing

NOTE Confidence: 0.97425926

00:21:05.454 --> 00:21:07.854 work of breathing and there was

NOTE Confidence: 0.97425926

00:21:07.854 --> 00:21:09.750 strong family history of asthma.

NOTE Confidence: 0.97425926

00:21:09.750 --> 00:21:11.622 This infant was takach Arctic with

NOTE Confidence: 0.97425926

00:21:11.622 --> 00:21:14.099 takip NIA and exam was notable for

NOTE Confidence: 0.97425926

00:21:14.099 --> 00:21:16.049 attractions and coarse breath sounds,

NOTE Confidence: 0.97425926

00:21:16.050 --> 00:21:18.150 but no audible wheezes were present,

NOTE Confidence: 0.97425926

00:21:18.150 --> 00:21:20.250 and the clinical team not only

NOTE Confidence: 0.97425926

00:21:20.250 --> 00:21:21.650 did a long ultrasound,

NOTE Confidence: 0.97425926

00:21:21.650 --> 00:21:23.205 but performed a cardiac ultrasound

NOTE Confidence: 0.97425926

00:21:23.205 --> 00:21:25.619 as well to rule out any other

NOTE Confidence: 0.97425926

00:21:25.619 --> 00:21:27.599 potential causes of compensated shock.

NOTE Confidence: 0.9475929

00:21:31.220 --> 00:21:33.962 So interestingly, this infant had one

NOTE Confidence: 0.9475929

00:21:33.962 --> 00:21:36.369 specific lung area of abnormality

NOTE Confidence: 0.9475929

00:21:36.369 --> 00:21:39.357 in the left posterior lung field.

NOTE Confidence: 0.9475929

00:21:39.360 --> 00:21:42.720 You can see here between those ribs.

NOTE Confidence: 0.9475929

00:21:42.720 --> 00:21:45.540 There is an absence of that

NOTE Confidence: 0.9475929

00:21:45.540 --> 00:21:47.990 pleural line and shred sign,

NOTE Confidence: 0.9475929

00:21:47.990 --> 00:21:51.254 so we have a lesion that is certainly

NOTE Confidence: 0.9475929

00:21:51.254 --> 00:21:54.689 abnormal and needs more thorough evaluation.

NOTE Confidence: 0.95041984

00:21:56.780 --> 00:22:00.508 So a scan performed on the opposite side,

NOTE Confidence: 0.95041984

00:22:00.510 --> 00:22:02.840 the right posterior lung field

NOTE Confidence: 0.95041984

00:22:02.840 --> 00:22:05.170 is here as a comparison,

NOTE Confidence: 0.95041984

00:22:05.170 --> 00:22:10.450 and you can see the intact pleura throughout.

NOTE Confidence: 0.95041984

00:22:10.450 --> 00:22:15.022 Spaces and. There are essentially normal

NOTE Confidence: 0.95041984

00:22:15.022 --> 00:22:17.760 a lines in the different lung zone.

NOTE Confidence: 0.95041984

00:22:17.760 --> 00:22:20.189 As the probe slides from the top

NOTE Confidence: 0.95041984

00:22:20.189 --> 00:22:22.609 of the patient down towards the

NOTE Confidence: 0.95041984

00:22:22.609 --> 00:22:24.779 diaphragm in a sagittal plane.

NOTE Confidence: 0.9417049

00:22:27.100 --> 00:22:31.120 And so we go back to the left side and

NOTE Confidence: 0.9417049

00:22:31.232 --> 00:22:35.464 get another clear look here at this sub,

NOTE Confidence: 0.9417049

00:22:35.470 --> 00:22:36.400 pleural abnormality,

NOTE Confidence: 0.9417049

00:22:36.400 --> 00:22:40.120 where there's a break in the pleural line.

NOTE Confidence: 0.9417049

00:22:40.120 --> 00:22:43.424 There's a shed sign and there are

NOTE Confidence: 0.9417049

00:22:43.424 --> 00:22:46.169 static air bronchograms in this lesion,

NOTE Confidence: 0.9417049

00:22:46.170 --> 00:22:47.986 demarcated by the arrow.

NOTE Confidence: 0.9417049

00:22:47.986 --> 00:22:51.618 And So what you do here is you

NOTE Confidence: 0.9417049

00:22:51.618 --> 00:22:54.460 turn the probe 90 degrees to try

NOTE Confidence: 0.9417049

00:22:54.460 --> 00:22:57.430 and assess a complete picture.

NOTE Confidence: 0.9417049

00:22:57.430 --> 00:23:00.405 Of this lesion, so when the probe

NOTE Confidence: 0.9417049

00:23:00.405 --> 00:23:03.490 is rotated in a transverse plane,

NOTE Confidence: 0.9417049

00:23:03.490 --> 00:23:05.990 you essentially see a confluence

NOTE Confidence: 0.9417049

00:23:05.990 --> 00:23:08.992 of beelines dropping down from the

NOTE Confidence: 0.9417049

00:23:08.992 --> 00:23:11.470 pleura as on the second ultrasound

NOTE Confidence: 0.9417049

00:23:11.470 --> 00:23:13.270 clip here and again.

NOTE Confidence: 0.9417049

00:23:13.270 --> 00:23:16.326 If you were to rotate it 90 degrees

NOTE Confidence: 0.9417049

00:23:16.326 --> 00:23:18.829 with the indicator towards the

NOTE Confidence: 0.9417049

00:23:18.829 --> 00:23:22.129 patient's head in a sagittal plane,

NOTE Confidence: 0.9417049

00:23:22.130 --> 00:23:25.147 you would have made out this abnormal

NOTE Confidence: 0.9417049

00:23:25.147 --> 00:23:27.810 consolidation which is highly suggestive.

NOTE Confidence: 0.9417049

00:23:27.810 --> 00:23:28.740 Of a pneumonia.

NOTE Confidence: 0.9846555

00:23:31.420 --> 00:23:33.736 So the clinical course was interesting

NOTE Confidence: 0.9846555

00:23:33.736 --> 00:23:36.395 for this infant was admitted for

NOTE Confidence: 0.9846555

00:23:36.395 --> 00:23:37.955 respiratory monitoring after

NOTE Confidence: 0.9846555

00:23:37.955 --> 00:23:40.555 initiation of hydros amoxicillin for

NOTE Confidence: 0.9846555

00:23:40.625 --> 00:23:42.623 this long ultrasound finding and X

NOTE Confidence: 0.9846555

00:23:42.623 --> 00:23:45.628 ray at the time was not obtained and

NOTE Confidence: 0.9846555

00:23:45.628 --> 00:23:47.713 had a pretty brief hospitalization.

NOTE Confidence: 0.9846555

00:23:47.720 --> 00:23:50.096 Had no fever, antibiotics ended up

NOTE Confidence: 0.9846555

00:23:50.096 --> 00:23:52.628 being a discontinued and was discharged

NOTE Confidence: 0.9846555

00:23:52.628 --> 00:23:55.250 home after some period of monitoring,

NOTE Confidence: 0.9846555

00:23:55.250 --> 00:23:58.169 which he seemed to do quite well.

NOTE Confidence: 0.95378697

00:24:00.670 --> 00:24:03.715 Then three days later, he came back,

NOTE Confidence: 0.95378697

00:24:03.720 --> 00:24:06.760 this now being the 4th ER visit with

NOTE Confidence: 0.95378697

00:24:06.760 --> 00:24:09.390 persistent fever and respiratory distress,

NOTE Confidence: 0.95378697

00:24:09.390 --> 00:24:12.878 at which point in X ray was repeated,

NOTE Confidence: 0.95378697

00:24:12.880 --> 00:24:14.752 showing bilateral findings concerning

NOTE Confidence: 0.95378697

00:24:14.752 --> 00:24:17.560 for pneumonia and amoxicillin was re

NOTE Confidence: 0.95378697

00:24:17.630 --> 00:24:20.290 prescribed and able to be discharged home,

NOTE Confidence: 0.95378697

00:24:20.290 --> 00:24:22.726 and he actually did quite well

NOTE Confidence: 0.95378697

00:24:22.726 --> 00:24:24.350 without any further emergency

NOTE Confidence: 0.95378697

00:24:24.424 --> 00:24:26.388 visits for labored breathing.

NOTE Confidence: 0.9664203

00:24:29.210 --> 00:24:32.154 OK, so the next possible outcome is that

NOTE Confidence: 0.9664203

00:24:32.154 --> 00:24:35.267 lung focus has the potential to lead to

NOTE Confidence: 0.9664203

00:24:35.267 --> 00:24:37.740 the prescription of more antibiotics.

NOTE Confidence: 0.9664203

00:24:37.740 --> 00:24:40.413 And I say this only because it is far

NOTE Confidence: 0.9664203

00:24:40.413 --> 00:24:42.800 more sensitive to pick up abnormalities

NOTE Confidence: 0.9664203

00:24:42.800 --> 00:24:45.896 when compared to X ray and viral

NOTE Confidence: 0.9664203

00:24:45.896 --> 00:24:47.904 pneumonia findings and bacterial

NOTE Confidence: 0.9664203

00:24:47.904 --> 00:24:50.351 pneumonia findings will have overlapped

NOTE Confidence: 0.9664203

00:24:50.351 --> 00:24:52.937 and this has been well documented

NOTE Confidence: 0.9664203

00:24:52.937 --> 00:24:56.066 to date with all the non specific

NOTE Confidence: 0.9664203

00:24:56.066 --> 00:24:58.700 findings we see with COVID pneumonia.

NOTE Confidence: 0.9664203

00:24:58.700 --> 00:25:00.072 Here in this case,

NOTE Confidence: 0.9664203

00:25:00.072 --> 00:25:03.232 we present a 27 month old with respiratory

NOTE Confidence: 0.9664203

00:25:03.232 --> 00:25:06.280 distress and fever in January 2020,

NOTE Confidence: 0.9664203

00:25:06.280 --> 00:25:08.806 when COVID pneumonia may have been

NOTE Confidence: 0.9664203

00:25:08.806 --> 00:25:10.490 circulating in the community.

NOTE Confidence: 0.9664203

00:25:10.490 --> 00:25:12.590 We don't know for 100%

NOTE Confidence: 0.9664203

00:25:12.590 --> 00:25:15.930 the symptoms consisted of.

NOTE Confidence: 0.9664203

00:25:15.930 --> 00:25:18.289 Two to three weeks of cough worse

NOTE Confidence: 0.9664203

00:25:18.289 --> 00:25:20.549 at night and one day a fever.

NOTE Confidence: 0.9664203

00:25:20.550 --> 00:25:22.530 Ah was ill appearing on exam

NOTE Confidence: 0.9664203

00:25:22.530 --> 00:25:23.190 with tachycardia,

NOTE Confidence: 0.9664203

00:25:23.190 --> 00:25:25.170 low oxygen saturation and takip NIA.

NOTE Confidence: 0.9664203

00:25:25.170 --> 00:25:26.585 Also was listless with flaring

NOTE Confidence: 0.9664203

00:25:26.585 --> 00:25:28.000 and accessory muscle use and

NOTE Confidence: 0.9664203

00:25:28.058 --> 00:25:29.790 diminished breath sounds throughout,

NOTE Confidence: 0.9664203

00:25:29.790 --> 00:25:32.079 but perhaps were sitting in the right

NOTE Confidence: 0.9664203

00:25:32.079 --> 00:25:34.428 upper lung field and the next rate

NOTE Confidence: 0.9664203

00:25:34.428 --> 00:25:36.390 is shown showed no focal infiltrate.

NOTE Confidence: 0.9484178

00:25:39.620 --> 00:25:42.462 Lang Focus performed in the right upper

NOTE Confidence: 0.9484178

00:25:42.462 --> 00:25:45.379 lobe showed the following abnormality.

NOTE Confidence: 0.9484178

00:25:45.380 --> 00:25:47.420 Disruption of the pleura,

NOTE Confidence: 0.9484178

00:25:47.420 --> 00:25:51.030 shred sign belines and this lesion was

NOTE Confidence: 0.9484178

00:25:51.030 --> 00:25:54.243 measured to be 1 1/2 centimeter and

NOTE Confidence: 0.9484178

00:25:54.243 --> 00:25:57.377 concerning for the start of a pneumonia.

NOTE Confidence: 0.966113

00:26:00.410 --> 00:26:02.489 So this channel is emitted to the

NOTE Confidence: 0.966113

00:26:02.489 --> 00:26:04.791 ICU and IBM PASILAN was initiated

NOTE Confidence: 0.966113

00:26:04.791 --> 00:26:07.479 was treated with Bipap and required

NOTE Confidence: 0.966113

00:26:07.479 --> 00:26:09.520 continuous albuterol and steroids.

NOTE Confidence: 0.966113

00:26:09.520 --> 00:26:11.108 Interestingly, a procalcitonin test

NOTE Confidence: 0.966113

00:26:11.108 --> 00:26:13.870 came back normal chest X ray done.

NOTE Confidence: 0.966113

00:26:13.870 --> 00:26:15.700 The subsequent date revealed and was

NOTE Confidence: 0.966113

00:26:15.700 --> 00:26:18.595 read as a right upper lobe infiltrate

NOTE Confidence: 0.966113

00:26:18.595 --> 00:26:20.209 consolidation versus atelectasis,

NOTE Confidence: 0.966113

00:26:20.210 --> 00:26:23.010 and this correlated perfectly with the area

NOTE Confidence: 0.966113

00:26:23.010 --> 00:26:26.547 of the lung that was imaged the day before.

NOTE Confidence: 0.966113

00:26:26.550 --> 00:26:28.918 With that abnormal finding.

NOTE Confidence: 0.966113

00:26:28.918 --> 00:26:31.878 Had a three day hospitalization.

NOTE Confidence: 0.966113

00:26:31.880 --> 00:26:34.790 Was managed as a bronchiolitis,

NOTE Confidence: 0.966113

00:26:34.790 --> 00:26:37.630 a therapy with treatment of

NOTE Confidence: 0.966113

00:26:37.630 --> 00:26:39.902 reactive bronchospasm and all

NOTE Confidence: 0.966113

00:26:39.902 --> 00:26:42.368 viral tests were negative,

NOTE Confidence: 0.966113

00:26:42.370 --> 00:26:46.120 so this child improved fully without

NOTE Confidence: 0.966113

00:26:46.120 --> 00:26:50.259 completing a full course of antibiotics.

NOTE Confidence: 0.966113

00:26:50.260 --> 00:26:51.022 And finally,

NOTE Confidence: 0.966113

00:26:51.022 --> 00:26:53.308 lung ultrasound may have the potential

NOTE Confidence: 0.966113

00:26:53.308 --> 00:26:55.279 to decrease antibiotic overuse.

NOTE Confidence: 0.966113

00:26:55.280 --> 00:26:57.765 So here's a great example of a

NOTE Confidence: 0.966113

00:26:57.765 --> 00:27:00.893 10 month old male with a fever

NOTE Confidence: 0.966113

00:27:00.893 --> 00:27:02.378 and suspected pneumonia,

NOTE Confidence: 0.966113

00:27:02.380 --> 00:27:05.158 as per clinicians that are referring

NOTE Confidence: 0.966113

00:27:05.158 --> 00:27:07.494 hospital who had initiated amoxicillin

NOTE Confidence: 0.966113

00:27:07.494 --> 00:27:10.322 with an X ray obtained was read

NOTE Confidence: 0.966113

00:27:10.322 --> 00:27:12.826 as haziness in the left lung zone.

NOTE Confidence: 0.966113

00:27:12.830 --> 00:27:14.327 Suspicious for pneumonia.

NOTE Confidence: 0.966113

00:27:14.327 --> 00:27:14.826 However,

NOTE Confidence: 0.966113

00:27:14.826 --> 00:27:17.321 there are definitely some other

NOTE Confidence: 0.966113

00:27:17.321 --> 00:27:19.846 things going on clinically to include

NOTE Confidence: 0.966113

00:27:19.846 --> 00:27:22.257 a prior COVID positive PCR test

NOTE Confidence: 0.966113

00:27:22.257 --> 00:27:24.207 10 days before this presentation

NOTE Confidence: 0.966113

00:27:24.207 --> 00:27:26.664 and daily fever for four days.

NOTE Confidence: 0.966113

00:27:26.664 --> 00:27:28.899 Popular rash on the torso.

NOTE Confidence: 0.966113

00:27:28.900 --> 00:27:31.140 Some lesions to the lip,

NOTE Confidence: 0.966113

00:27:31.140 --> 00:27:31.483 gums,

NOTE Confidence: 0.966113

00:27:31.483 --> 00:27:33.884 and some swelling to the hands and

NOTE Confidence: 0.966113

00:27:33.884 --> 00:27:36.705 feet so multisystem picture and this

NOTE Confidence: 0.966113

00:27:36.705 --> 00:27:39.280 infant actually looked quite well

NOTE Confidence: 0.966113

00:27:39.280 --> 00:27:41.867 appearing and no respiratory distress.

NOTE Confidence: 0.966113

00:27:41.870 --> 00:27:43.208 Playful and unremarkable

NOTE Confidence: 0.966113

00:27:43.208 --> 00:27:44.100 physical examination,

NOTE Confidence: 0.966113

00:27:44.100 --> 00:27:47.493 and you can see the labs there had a

NOTE Confidence: 0.966113

00:27:47.493 --> 00:27:50.418 little thrombocytosis and a slight.

NOTE Confidence: 0.966113

00:27:50.420 --> 00:27:53.577 Elevation in the ESR and the CRP.

NOTE Confidence: 0.8432531

00:27:55.640 --> 00:27:59.364 So in the PDE complete 6 zone,

NOTE Confidence: 0.8432531

00:27:59.370 --> 00:28:02.178 longer sound was performed and well

NOTE Confidence: 0.8432531

00:28:02.178 --> 00:28:05.358 tolerated and it revealed essentially the

NOTE Confidence: 0.8432531

00:28:05.358 --> 00:28:08.428 following findings which run remarkable.

NOTE Confidence: 0.8432531

00:28:08.430 --> 00:28:11.608 You can see a lines throughout all

NOTE Confidence: 0.8432531

00:28:11.608 --> 00:28:14.830 the lung zones being interrogated,

NOTE Confidence: 0.8432531

00:28:14.830 --> 00:28:17.974 and occasionally there's a little divot

NOTE Confidence: 0.8432531

00:28:17.974 --> 00:28:22.960 at the level of the pleura, but no true.

NOTE Confidence: 0.8432531

00:28:22.960 --> 00:28:25.280 B line with stacked,

NOTE Confidence: 0.8432531

00:28:25.280 --> 00:28:27.515 horizontal reverberation dipping down all

NOTE Confidence: 0.8432531

00:28:27.515 --> 00:28:31.369 the way down to the bottom of the screen.

NOTE Confidence: 0.8432531

00:28:31.370 --> 00:28:32.675 No shred sign.

NOTE Confidence: 0.8432531

00:28:32.675 --> 00:28:34.415 No static air bronchograms,

NOTE Confidence: 0.8432531

00:28:34.420 --> 00:28:37.030 and certainly no signs of hepatization.

NOTE Confidence: 0.8432531

00:28:37.030 --> 00:28:39.436 So based on these findings we

NOTE Confidence: 0.8432531

00:28:39.436 --> 00:28:41.040 actually made the recommendation

NOTE Confidence: 0.8432531

00:28:41.112 --> 00:28:43.120 to discontinue the amoxicillin.

NOTE Confidence: 0.920523169999999

00:28:45.660 --> 00:28:48.840 And this little infant was actually

NOTE Confidence: 0.920523169999999

00:28:48.840 --> 00:28:52.044 somewhat fascinating as it seemed to

NOTE Confidence: 0.920523169999999

00:28:52.044 --> 00:28:55.020 have some sort of mild inflammatory

NOTE Confidence: 0.920523169999999

00:28:55.020 --> 00:28:57.512 picture with a slightly elevated

NOTE Confidence: 0.920523169999999

00:28:57.512 --> 00:29:00.802 BNP and a slightly elevated D dimer

NOTE Confidence: 0.920523169999999

00:29:00.810 --> 00:29:03.325 was admitted for surveillance with

NOTE Confidence: 0.920523169999999

00:29:03.325 --> 00:29:05.840 concern for MIC normal echocardiogram

NOTE Confidence: 0.920523169999999

00:29:05.912 --> 00:29:08.892 during the admission, and there was

NOTE Confidence: 0.920523169999999

00:29:08.892 --> 00:29:10.908 no progression or decompensation,

NOTE Confidence: 0.920523169999999

00:29:10.910 --> 00:29:13.940 so the team was able to.

NOTE Confidence: 0.920523169999999

00:29:13.940 --> 00:29:16.520 The first steroids and IVIG.

NOTE Confidence: 0.920523169999999

00:29:16.520 --> 00:29:18.753 And had a great follow up visit

NOTE Confidence: 0.920523169999999

00:29:18.753 --> 00:29:20.775 10 days later with normalization

NOTE Confidence: 0.920523169999999

00:29:20.775 --> 00:29:23.255 of the inflammatory markers and

NOTE Confidence: 0.920523169999999

00:29:23.255 --> 00:29:25.599 was clinically well appearing and

NOTE Confidence: 0.920523169999999

00:29:25.599 --> 00:29:27.939 back to herself at this point.

NOTE Confidence: 0.939759970000001

00:29:30.770 --> 00:29:33.885 So there's lots of further inquiry that

NOTE Confidence: 0.939759970000001

00:29:33.885 --> 00:29:37.281 is necessary so that we can fine tune

NOTE Confidence: 0.939759970000001

00:29:37.281 --> 00:29:40.772 how to integrate lung pocus as part of

NOTE Confidence: 0.939759970000001

00:29:40.772 --> 00:29:43.147 our workups for pediatric pneumonia.

NOTE Confidence: 0.939759970000001

00:29:43.150 --> 00:29:46.142 And it's possible that we will have to

NOTE Confidence: 0.939759970000001

00:29:46.142 --> 00:29:47.796 incorporate long ultrasound findings

NOTE Confidence: 0.939759970000001

00:29:47.796 --> 00:29:50.701 with not only physical exam but also

NOTE Confidence: 0.939759970000001

00:29:50.701 --> 00:29:53.840 some laboratory values to make good

NOTE Confidence: 0.939759970000001

00:29:53.840 --> 00:29:55.960 decisions about antibiotic stewardship.

NOTE Confidence: 0.939759970000001

00:29:55.960 --> 00:29:58.200 And there's also some instances

NOTE Confidence: 0.939759970000001

00:29:58.200 --> 00:29:59.544 where lung ultrasound.

NOTE Confidence: 0.939759970000001

00:29:59.550 --> 00:30:02.226 Will have to be incorporated in

NOTE Confidence: 0.939759970000001

00:30:02.226 --> 00:30:04.010 parallel with chest radiography

NOTE Confidence: 0.939759970000001

00:30:04.087 --> 00:30:06.407 in certain instances to minimize

NOTE Confidence: 0.939759970000001

00:30:06.407 --> 00:30:08.263 our risk for misdiagnosis.

NOTE Confidence: 0.9635818

00:30:11.280 --> 00:30:14.619 And so here in this final case you can

NOTE Confidence: 0.9635818

00:30:14.619 --> 00:30:18.008 see we have a 21 year old with fever,

NOTE Confidence: 0.9635818

00:30:18.010 --> 00:30:19.129 wheezing and decreased

NOTE Confidence: 0.9635818

00:30:19.129 --> 00:30:20.994 breath sounds on the right.

NOTE Confidence: 0.9635818

00:30:21.000 --> 00:30:24.000 On this frontal projection of the X ray,

NOTE Confidence: 0.9635818

00:30:24.000 --> 00:30:26.359 you can see that there is an

NOTE Confidence: 0.9635818

00:30:26.359 --> 00:30:27.876 obvious abnormality that could

NOTE Confidence: 0.9635818

00:30:27.876 --> 00:30:29.608 be interpreted as pneumonia.

NOTE Confidence: 0.9635818

00:30:29.610 --> 00:30:32.769 If you put the lung probe as was done

NOTE Confidence: 0.9635818

00:30:32.769 --> 00:30:35.282 in this case, right over this lesion,

NOTE Confidence: 0.9635818

00:30:35.282 --> 00:30:38.087 you can see a mass like finding which

NOTE Confidence: 0.9635818

00:30:38.087 --> 00:30:40.447 could be misconstrued as hepatization.

NOTE Confidence: 0.9635818

00:30:40.450 --> 00:30:42.114 There is no lines.

NOTE Confidence: 0.9635818

00:30:42.114 --> 00:30:44.194 There are no body lines.

NOTE Confidence: 0.9635818

00:30:44.200 --> 00:30:46.340 There is no shred sign.

NOTE Confidence: 0.9635818

00:30:46.340 --> 00:30:48.824 There is no static air bronchograms

NOTE Confidence: 0.9635818

00:30:48.824 --> 00:30:51.427 and this tissue doesn't quite look

NOTE Confidence: 0.9635818

00:30:51.427 --> 00:30:54.055 hypothesized like in the prior example.

NOTE Confidence: 0.9635818

00:30:54.060 --> 00:30:56.592 So if you're up to obtain

NOTE Confidence: 0.9635818

00:30:56.592 --> 00:30:58.780 a lateral chest X ray,

NOTE Confidence: 0.9635818

00:30:58.780 --> 00:31:00.925 this diagnosis is more consistent

NOTE Confidence: 0.9635818

00:31:00.925 --> 00:31:03.070 with the anterior mediastinal mass,

NOTE Confidence: 0.9635818

00:31:03.070 --> 00:31:05.644 and this young man was subsequently

NOTE Confidence: 0.9635818

00:31:05.644 --> 00:31:07.360 diagnosed with a lymphoma.

NOTE Confidence: 0.9635818

00:31:07.360 --> 00:31:09.640 So the important point here

NOTE Confidence: 0.9635818

00:31:09.640 --> 00:31:12.500 is that a chest wall mass.

NOTE Confidence: 0.9635818

00:31:12.500 --> 00:31:14.505 We can mimic potentially the

NOTE Confidence: 0.9635818

00:31:14.505 --> 00:31:16.510 appearance of hepatocytes lung tissue,

NOTE Confidence: 0.9635818

00:31:16.510 --> 00:31:18.664 and this needs to be carefully

NOTE Confidence: 0.9635818

00:31:18.664 --> 00:31:20.645 accounted for during the clinical

NOTE Confidence: 0.9635818

00:31:20.645 --> 00:31:22.529 assessment of our patients.

NOTE Confidence: 0.98843795

00:31:24.900 --> 00:31:27.600 A couple of other pitfalls and

NOTE Confidence: 0.98843795

00:31:27.600 --> 00:31:30.550 potential false positives in the right

NOTE Confidence: 0.98843795

00:31:30.550 --> 00:31:34.608 clinical scenario, sinus can appear.

NOTE Confidence: 0.98843795

00:31:34.610 --> 00:31:39.391 Is a homogeneous you know appearing mass

NOTE Confidence: 0.98843795

00:31:39.391 --> 00:31:43.918 typically is this is found anteriorly.

NOTE Confidence: 0.98843795

00:31:43.920 --> 00:31:47.187 In front of the heart and can be seen.

NOTE Confidence: 0.98843795

00:31:47.190 --> 00:31:49.766 In my experience both on the right side

NOTE Confidence: 0.98843795

00:31:49.766 --> 00:31:52.938 and in the left side of the chest with

NOTE Confidence: 0.98843795

00:31:52.938 --> 00:31:55.539 integration of the anterior lung fields.

NOTE Confidence: 0.98843795

00:31:55.540 --> 00:31:58.428 So we must be able to recognize thymus

NOTE Confidence: 0.98843795

00:31:58.428 --> 00:32:00.581 tissue as normal and actually one

NOTE Confidence: 0.98843795

00:32:00.581 --> 00:32:03.520 of the keys for me is the plural.

NOTE Confidence: 0.98843795

00:32:03.520 --> 00:32:05.851 So in this image of thymus you

NOTE Confidence: 0.98843795

00:32:05.851 --> 00:32:08.194 can still make out the echogenic

NOTE Confidence: 0.98843795

00:32:08.194 --> 00:32:10.726 bright pleura in between the rib

NOTE Confidence: 0.98843795

00:32:10.726 --> 00:32:13.768 spaces and so that to me is a clear

NOTE Confidence: 0.98843795

00:32:13.768 --> 00:32:16.882 indicator that this is not consistent.

NOTE Confidence: 0.98843795

00:32:16.882 --> 00:32:20.590 With long hair participation or pneumonia.

NOTE Confidence: 0.98843795

00:32:20.590 --> 00:32:24.346 Finally, in the left upper quadrant,

NOTE Confidence: 0.98843795

00:32:24.350 --> 00:32:26.598 especially when assessing for.

NOTE Confidence: 0.98843795

00:32:26.598 --> 00:32:29.970 A fusion with the curvilinear probe,

NOTE Confidence: 0.98843795

00:32:29.970 --> 00:32:32.130 the stomach, when it is filled

NOTE Confidence: 0.98843795

00:32:32.130 --> 00:32:34.479 with mixed content to include air,

NOTE Confidence: 0.98843795

00:32:34.480 --> 00:32:37.105 can give off a bright echogenic appearance.

NOTE Confidence: 0.98843795

00:32:37.110 --> 00:32:39.196 So you really want to be very

NOTE Confidence: 0.98843795

00:32:39.196 --> 00:32:41.529 clear as to whether these findings

NOTE Confidence: 0.98843795

00:32:41.529 --> 00:32:44.247 are above or below the diaphragm.

NOTE Confidence: 0.98843795

00:32:44.250 --> 00:32:46.404 So in this particular image you're

NOTE Confidence: 0.98843795

00:32:46.404 --> 00:32:48.390 not seeing the diaphragm clearly,

NOTE Confidence: 0.98843795

00:32:48.390 --> 00:32:50.646 but you're seeing pleura at the

NOTE Confidence: 0.98843795

00:32:50.646 --> 00:32:52.150 top of the screen,

NOTE Confidence: 0.98843795

00:32:52.150 --> 00:32:55.158 next to the P with the lung sliding.

NOTE Confidence: 0.98843795

00:32:55.160 --> 00:32:58.016 And so you see, pleura rib pleura.

NOTE Confidence: 0.98843795

00:32:58.020 --> 00:33:00.806 Read you don't quite see the diaphragm,

NOTE Confidence: 0.98843795

00:33:00.810 --> 00:33:02.004 but the spleen.

NOTE Confidence: 0.98843795

00:33:02.004 --> 00:33:02.800 Is there,

NOTE Confidence: 0.98843795

00:33:02.800 --> 00:33:03.146 UM,

NOTE Confidence: 0.98843795

00:33:03.146 --> 00:33:05.222 right adjacent to the rib shadow

NOTE Confidence: 0.98843795

00:33:05.222 --> 00:33:08.328 that is in the center of the screen

NOTE Confidence: 0.98843795

00:33:08.328 --> 00:33:10.825 and the stomach with airfield and

NOTE Confidence: 0.98843795

00:33:10.825 --> 00:33:13.429 mixed contents is giving off a

NOTE Confidence: 0.98843795

00:33:13.429 --> 00:33:15.536 bright appearance behind this plane.

NOTE Confidence: 0.98843795

00:33:15.536 --> 00:33:16.730 So location, location,

NOTE Confidence: 0.98843795

00:33:16.730 --> 00:33:18.350 location and pattern recognition

NOTE Confidence: 0.98843795

00:33:18.350 --> 00:33:20.780 and knowing your landmarks and what

NOTE Confidence: 0.98843795

00:33:20.841 --> 00:33:22.695 you're looking for are going to

NOTE Confidence: 0.98843795

00:33:22.695 --> 00:33:25.071 be very important to minimize your

NOTE Confidence: 0.98843795

00:33:25.071 --> 00:33:26.679 false positive interpretations.

NOTE Confidence: 0.97488135

00:33:29.470 --> 00:33:32.116 So this is such an exciting modality,

NOTE Confidence: 0.97488135

00:33:32.120 --> 00:33:34.388 but we're clearly not doing this

NOTE Confidence: 0.97488135

00:33:34.388 --> 00:33:35.900 protocolized on every patient,

NOTE Confidence: 0.97488135

00:33:35.900 --> 00:33:39.680 and there are lots of reasons why this is so.

NOTE Confidence: 0.97488135

00:33:39.680 --> 00:33:41.936 Number one from a practical standpoint,

NOTE Confidence: 0.97488135

00:33:41.940 --> 00:33:44.684 it takes time, which it takes a longer

NOTE Confidence: 0.97488135

00:33:44.684 --> 00:33:47.427 time for the setup and the process

NOTE Confidence: 0.97488135

00:33:47.427 --> 00:33:49.856 of completing a high quality long

NOTE Confidence: 0.97488135

00:33:49.856 --> 00:33:52.896 ultrasound in a infant and a toddler as

NOTE Confidence: 0.97488135

00:33:52.896 --> 00:33:57.520 opposed to an X ray is just a quick.

NOTE Confidence: 0.97488135

00:33:57.520 --> 00:33:59.392 Picture with a plate on the

NOTE Confidence: 0.97488135

00:33:59.392 --> 00:34:01.090 back or on the side.

NOTE Confidence: 0.97488135

00:34:01.090 --> 00:34:03.589 Patient cooperation does come into play here,

NOTE Confidence: 0.97488135

00:34:03.590 --> 00:34:06.500 so you really have to.

NOTE Confidence: 0.97488135

00:34:06.500 --> 00:34:08.775 Engage, you know the caregiver

NOTE Confidence: 0.97488135

00:34:08.775 --> 00:34:11.968 to be a partner, and you know,

NOTE Confidence: 0.97488135

00:34:11.968 --> 00:34:13.336 sometimes you know.

NOTE Confidence: 0.97488135

00:34:13.340 --> 00:34:16.160 Patients just are not going to

NOTE Confidence: 0.97488135

00:34:16.160 --> 00:34:19.270 tolerate either the gel or the probe,

NOTE Confidence: 0.97488135

00:34:19.270 --> 00:34:22.726 or just the whole process in general and

NOTE Confidence: 0.97488135

00:34:22.726 --> 00:34:26.326 we need adequate training and we need to

NOTE Confidence: 0.97488135

00:34:26.326 --> 00:34:29.611 reach a level of competency across the

NOTE Confidence: 0.97488135

00:34:29.611 --> 00:34:33.441 board that is not yet been well established.

NOTE Confidence: 0.97488135

00:34:33.441 --> 00:34:34.423 And unfortunately,

NOTE Confidence: 0.97488135

00:34:34.423 --> 00:34:37.369 when doing research around this topic.

NOTE Confidence: 0.97488135

00:34:37.370 --> 00:34:39.735 There are serious challenges related

NOTE Confidence: 0.97488135

00:34:39.735 --> 00:34:41.627 to assigning an incontrovertible

NOTE Confidence: 0.97488135

00:34:41.627 --> 00:34:43.469 referenced or criterion standard,

NOTE Confidence: 0.97488135

00:34:43.470 --> 00:34:46.098 but for resource limited settings and

NOTE Confidence: 0.97488135

00:34:46.098 --> 00:34:48.409 for individuals who are comfortable

NOTE Confidence: 0.97488135

00:34:48.409 --> 00:34:50.814 at performing lung ultrasound and

NOTE Confidence: 0.97488135

00:34:50.814 --> 00:34:53.291 are able to interpret findings

NOTE Confidence: 0.97488135

00:34:53.291 --> 00:34:55.187 in the clinical context,

NOTE Confidence: 0.97488135

00:34:55.190 --> 00:34:58.130 this is an invaluable tool with tremendous

NOTE Confidence: 0.97488135

00:34:58.130 --> 00:35:01.371 promise for the future care of our

NOTE Confidence: 0.97488135

00:35:01.371 --> 00:35:03.279 pediatric patients with respiratory

NOTE Confidence: 0.97488135

00:35:03.279 --> 00:35:05.979 distress or unexplained chest pain,

NOTE Confidence: 0.97488135

00:35:05.980 --> 00:35:09.804 and there is certainly a lot of enthusiasm.

NOTE Confidence: 0.97488135

00:35:09.810 --> 00:35:12.768 And momentum behind for lung pocus

NOTE Confidence: 0.97488135

00:35:12.768 --> 00:35:15.851 to increase our position in emergency

NOTE Confidence: 0.97488135

00:35:15.851 --> 00:35:19.421 medicine when we are challenged to make

NOTE Confidence: 0.97488135

00:35:19.421 --> 00:35:22.170 clinical decisions with oftentimes

NOTE Confidence: 0.97488135

00:35:22.170 --> 00:35:25.038 imperfect and limited information.

NOTE Confidence: 0.9696989

00:35:27.680 --> 00:35:29.520 This concludes our introduction

NOTE Confidence: 0.9696989

00:35:29.520 --> 00:35:31.820 to lung ultrasound Part 2.

NOTE Confidence: 0.9696989

00:35:31.820 --> 00:35:34.635 We hope you find this

NOTE Confidence: 0.9696989

00:35:34.635 --> 00:35:36.324 information useful and.

NOTE Confidence: 0.9696989

00:35:36.330 --> 00:35:37.980 If there are any questions,

NOTE Confidence: 0.9696989

00:35:37.980 --> 00:35:39.960 please don't hesitate to reach out,

NOTE Confidence: 0.9696989

00:35:39.960 --> 00:35:41.490 otherwise we will see you

NOTE Confidence: 0.9696989

00:35:41.490 --> 00:35:43.448 soon and this content will be

NOTE Confidence: 0.9696989

00:35:43.448 --> 00:35:44.908 updated as deemed necessary.