

I N D E X

WEDNESDAY, APRIL 18, 2001 2849: 3
1:35 P.M. 2849: 7

WITNESS

SAM HAMMAR

DIRECT EXAMINATION (RESUMED) BY MR. PIUZE..... 2849: 25

1 CASE NUMBER: BC 226593
2 CASE NAME: BOEKEN V. PHILIP MORRIS
3 LOS ANGELES, CALIFORNIA WEDNESDAY, APRIL 18, 2001
4 DEPARTMENT 308 HON. CHARLES W MC COY, JUDGE
5 APPEARANCES: (AS NOTED ON TITLE PAGE.)
6 REPORTER: LINDA STALEY, CSR NO. 3359, RMR, CRR
7 TIME: 1:35 P.M.

8

9

- - 0 - -

10

11

SAM HAMMAR,

12

WITNESS, RESUMED THE STAND AND TESTIFIED FURTHER AS FOLLOWS:

13

14

THE COURT: THANK YOU TO OUR SWIFT MOVING COURT

15

ATTENDANT.

16

PLEASE BE SEATED.

17

ALL RIGHT. OUR JURY PANEL IS PRESENT; COUNSEL

18

PRESENT; THE WITNESS IS ON THE WITNESS STAND.

19

SIR, YOU UNDERSTAND YOU ARE STILL UNDER OATH?

20

THE WITNESS: YES, SIR.

21

THE COURT: ALL RIGHT. VERY WELL.

22

MR. PIUZE.

23

MR. PIUZE: THANK YOU, YOUR HONOR.

24

25

DIRECT EXAMINATION (RESUMED)

26

BY MR. PIUZE:

27

Q. THIS IS 8050.11?

28

A. SURE.

1 Q. YOU TOLD US ABOUT THE FACT YOU' RE A
2 PATHOLOGIST, HOW LONG YOU' VE BEEN A PATHOLOGIST, WHERE YOU
3 WENT TO, WHERE YOU' VE TAUGHT, WHERE YOU' VE BEEN PRACTICING.
4 DO YOU HAVE A PART OF THE BODY IN WHICH YOU
5 SPECIALIZE?

6 A. I DO.

7 Q. WHAT' S THAT?

8 A. THE LUNGS.

9 Q. IS THAT CALLED A PULMONARY PATHOLOGIST?

10 A. YES. PULMONARY AND LUNG ARE SYNONYMOUS.

11 Q. I' M GOING TO SHOW THIS TO YOU ONE MORE TIME,
12 THEN YOU WON' T BE ABLE TO SEE IT FOR AWHILE.

13 OKAY?

14 A. OKAY.

15 Q. WHAT PERCENTAGE OF YOUR TIME NOW -- NOT IN THE
16 ACADEMIC FIELD, BUT OUT IN THE REAL WORLD.

17 WHAT PERCENTAGE OF YOUR TIME DO YOU SPEND WITH
18 PULMONARY OR CHEST, LUNG PATHOLOGY AS OPPOSED TO OTHER PARTS
19 OF THE BODY?

20 A. APPROXIMATELY 85 PERCENT.

21 Q. NOW, AS AN OVERVIEW, IN THE REAL WORLD, WHAT
22 DOES A PULMONARY PATHOLOGIST DEAL WITH BESIDES LUNG CANCER,
23 PLEASE?

24 A. THERE ARE ALL KINDS OF LUNG DISEASE THAT RANGE
25 FROM CONGENITAL TYPE DISEASES OF THE LUNG, LIKE EXTRA LOBES
26 OR CONGENITAL CYSTS IN THE LUNGS, TO A WIDE VARIETY OF WHAT
27 ARE CALLED INTERSTITIAL LUNG DISEASES IN WHICH YOU GET
28 CHANGES IN THE INTERSTITIUM OF THE LUNG WHICH IS THE

1 SUPPORTIVE FRAMEWORK OF THE LUNG.

2 THERE ARE A WIDE NUMBER OF INFECTIOUS DISEASES
3 THAT OCCUR IN THE LUNGS RANGING ANYWHERE FROM ORDINARY
4 BACTERIAL PNEUMONIA TO SOME VERY RARE INFECTIONS THAT WE
5 SOMETIMES SEE IN PATIENTS WITH AIDS.

6 ONE OF MY BIGGEST INTERESTS IN THE LUNGS HAS TO
7 DO WITH THE LINING OF THE LUNG AND THE CHEST CAVITY, WHICH IS
8 CALLED THE PLEURA. AND THAT GIVES RISE TO A RARE TYPE OF
9 CANCER CALLED MESOTHELIOMA CAUSED BY ASBESTOS. I SEE A LOT
10 OF THAT. SO THERE'S JUST A WIDE RANGE OF DISEASES OF THE
11 LUNGS.

12 IN THE BOOK THAT I'M A COEDITOR OF, THERE ARE
13 35 CHAPTERS IN THAT BOOK, AND IT'S 1565 PAGES LONG. SO I
14 THINK THAT KIND OF GIVES YOU AN IDEA THAT THERE'S QUITE A BIT
15 OF INFORMATION TO TALK ABOUT WHEN YOU TALK ABOUT DISEASES OF
16 THE LUNG FROM A PATHOLOGIST'S VIEWPOINT.

17 Q. THANK YOU.

18 IF YOU'RE SPENDING 85 PERCENT OF YOUR
19 PROFESSIONAL TIME ON LUNGS, ROUGHLY WHAT PERCENTAGE OF YOUR
20 PROFESSIONAL TIME DO YOU SPEND ON LUNG CANCER -- ONE FORM OR
21 ANOTHER OF LUNG CANCER, PLEASE?

22 A. PROBABLY, ABOUT, I WOULD SAY, 40 PERCENT.

23 Q. 40 PERCENT. GOOD ENOUGH.

24 OVER THE COURSE OF THE YEARS, UNDER WHAT
25 CIRCUMSTANCES HAVE YOU REVIEWED SLIDES THAT CONTAIN TISSUE
26 FROM PEOPLE'S LUNGS?

27 A. WELL, I'VE REVIEWED IT AS A PRACTICING
28 PATHOLOGIST THROUGHOUT MY CAREER.

1 WHEN I WAS AT THE UNIVERSITY OF UTAH, WHEN I
2 WAS AT VIRGINIA MASON MEDICAL CENTER IN SEATTLE, AND WHEN I
3 WORKED AS A PATHOLOGIST IN BREMERTON. I SAW CASES BOTH FROM
4 BIOPSY, SPECIMENS TAKEN BY PULMONARY MEDICINE DOCTORS SENT TO
5 ME. AND ALSO, I'VE SEEN CASES OF RESECTED LUNGS AND RESECTED
6 PORTIONS OF LUNGS THAT WERE SENT TO ME BY SURGEONS.

7 I'VE ALSO DONE SEVERAL HUNDRED AUTOPSIES OR
8 HAVE EVALUATED SEVERAL HUNDRED AUTOPSY SPECIMENS OF PEOPLE
9 WHO HAVE DIED FROM LUNG CANCER. SO A WIDE VARIETY OF TYPE OF
10 SPECIMENS.

11 Q. IN YOUR DAY-TO-DAY PRACTICE AS IT HAS EXISTED
12 OVER THE LAST, ARBITRARILY, 10 OR 15 YEARS, IN THAT AREA,
13 SOMETIMES, DO DOCTORS FROM LOS ANGELES SEND SLIDES ALL THE
14 WAY UP TO WASHINGTON FOR YOU TO LOOK AT?

15 A. YES. IN FACT, I KNOW A FEW OF THE PATHOLOGISTS
16 AT UCLA. AND DR. SONITA BHUTA, B-H-U-T-A, IS A VERY GOOD
17 FRIEND OF MINE. AND I WOULD SAY, ABOUT EIGHT MONTHS AGO,
18 MAYBE MORE THAN THAT -- TIME GOES FAST -- SHE SENT ME A CASE
19 OF A LESION IN A RELATIVELY YOUNG MAN WHO WAS HOSPITALIZED AT
20 UCLA IN WHICH ONE OF THE PATHOLOGISTS THERE HAD MADE A
21 DIAGNOSIS OF A SARCOMA OF THE LUNG.

22 AND WHAT SARCOMA MEANS IS A MALIGNANCY OF CELLS
23 THAT ARE USUALLY SPINDLE SHAPED OR ELONGATED, WHICH IS A VERY
24 RARE TYPE OF PRIMARY CANCER IN THE LUNG. MOST OF THE
25 SARCOMAS ONE WOULD SEE IN THE LUNG WOULD BE METASTATIC FROM
26 ANOTHER SITE.

27 BUT I LOOKED AT THAT CASE, AND I WAS CERTAIN
28 THAT THIS WASN'T A CANCER. I THOUGHT -- I THOUGHT IT WAS

1 WHAT IS CALLED AN INFLAMMATORY PSEUDOTUMOR. AND "PSEUDO"
2 MEANS FALSE; "TUMOR" JUST MEANS A MASS.

3 AND I SHARED IT WITH A FRIEND OF MINE IN
4 SEATTLE WHO WAS THE COEDITOR OF THIS BOOK THAT WE WROTE. HE
5 CAME TO THE SAME DIAGNOSIS.

6 SO I SENT BACK A REPORT TO SONITA TELLING HER
7 THAT, IN MY OPINION, THIS WAS NOT A SARCOMA; THIS WAS AN
8 INFLAMMATORY REACTION, AND THIS PATIENT WILL BE FINE. AND I
9 TALKED TO HER NOT TOO LONG AGO AND SHE SAID THAT THERE HAD
10 BEEN NO EVIDENCE THAT THIS MAN HAD A REOCCURRENCE, AND HE WAS
11 WELL. SO I'VE SEEN A FEW CASES FROM UCLA.

12 I'VE SEEN SEVERAL CASES THAT ARE SENT TO ME
13 FROM OTHER PATHOLOGISTS, FOR EXAMPLE, DOWN AT EISENHOWER
14 MEDICAL CENTER, RANCHO MIRAGE, CALIFORNIA, AND WE DO THE EM
15 WORK FOR TWO HOSPITALS IN SAN FRANCISCO.

16 BY "EM " I MEAN ELECTRON MICROSCOPY.

17 Q. THANK YOU. THIS MORNING, I THINK YOU WERE ON
18 THE WITNESS STAND FOR 17 MINUTES OR SOMETHING LIKE AND NOW,
19 IN THE FIRST FIVE MINUTES THIS AFTERNOON, YOU'VE USED THE
20 TERM "PRIMARY," AND THIS TIME WHEN YOU USED IT, YOU USED IT
21 IN CONJUNCTION WITH METASTATIC.

22 AND I WOULD APPRECIATE IT IF YOU'D TAKE A
23 COUPLE OF MINUTES AND EXPLAIN TO THE JURY WHAT A PRIMARY
24 TUMOR IS AND WHAT METASTATIC HAS TO DO WITH OR DOESN'T HAVE
25 TO DO WITH A PRIMARY TUMOR, PLEASE.

26 A. SURE. A PRIMARY TUMOR IS DEFINED AS A TUMOR,
27 USUALLY A CANCER, THAT'S ARISING IN AN ORGAN WHERE IT
28 ORIGINATED FROM

1 FOR EXAMPLE, PRIMARY LUNG CANCER WOULD BE A
2 CANCER THAT AROSE IN THE LUNG AND WAS DERIVED FROM SOME OF
3 THE CELLS, ONE OR MORE DIFFERENT TYPES OF CELLS IN THE LUNGS.

4 A METASTATIC CANCER IN THE LUNG, OR WHAT'S
5 SOMETIMES REFERRED TO AS SECONDARY CANCER IN THE LUNG, WOULD
6 BE A CANCER THAT HAD COME FROM SOME OTHER PART OF THE BODY.

7 FOR EXAMPLE, IN THE CASE OF SARCOMA, MAYBE A
8 PERSON HAD MASS IN THEIR LEG THAT TURNED OUT TO BE A CANCER
9 OF CELLS OF CONNECTIVE TISSUE IN THEIR LEG, AND THAT TUMOR
10 INVADED BLOOD VESSELS AND METASTASIZED OR SPREAD TO THE LUNG.
11 THAT WOULD BE A METASTATIC TUMOR OF THE LUNG OR A SECONDARY.

12 IT TURNS OUT THAT PRIMARY LUNG CANCERS DO
13 METASTASIZE, AND THEY HAVE SOME FAIRLY CHARACTERISTIC SITES
14 THAT THEY METASTASIZE TO. THE MOST COMMON BEING THE LYMPH
15 NODES THAT SURROUND THE LUNG WHERE THE AIR TUBES AND VESSELS
16 ENTER. THE LYMPH NODES IN THE CENTER OF THE CHEST. AND THEN
17 THE NEXT MOST COMMON SITE OUTSIDE OF THE CHEST WOULD BE THE
18 ADRENAL GLANDS. NEXT MOST COMMON WOULD BE THE LIVER. NEXT
19 MOST COMMON WOULD BE THE BONE. AND THE NEXT MOST COMMON
20 WOULD BE THE BRAIN.

21 Q. THANK YOU.

22 SO TO TAKE THAT AND PUT IT INTO MR. BOEKEN'S
23 EQUATION, RIGHT NOW, WE'RE TOLD, HE HAS BRAIN CANCER.

24 DOES HE HAVE PRIMARY CANCER OR METASTATIC BRAIN
25 CANCER?

26 A. HE HAS A METASTATIC CANCER. HE HAS A PRIMARY
27 CANCER IN THE LUNG IN THE RIGHT UPPER LOBE THAT HAD
28 PREVIOUSLY METASTASIZED TO HIS BRAIN. PREVIOUSLY, IN THE

1 PATHOLOGY MATERIAL, THAT WAS REMOVED WHEN HE HAD HIS SURGERY
2 IN 1999. HE HAD METASTASIS TO THE LYMPH NODES. AND AFTER
3 THAT, IT HAD METASTASIZED TO HIS THIRD LUMBAR, AND I THINK
4 FOURTH LUMBAR CEREBRAL BODY. THAT'S PART OF THE LOWER SPINE.

5 Q. THANK YOU.

6 NOW, HERE'S WHERE WE WERE. UP IN WASHINGTON,
7 VARIOUS HOSPITALS AROUND THE STATE OF CALIFORNIA AND DOCTORS
8 AROUND THE STATE OF CALIFORNIA, INCLUDING UCLA MEDICAL
9 CENTER, SOMETIMES SEND YOU LUNG TISSUE TO TAKE A LOOK AT,
10 RIGHT?

11 A. YES.

12 Q. OKAY. WHEN YOU LOOKED AT MR. BOEKEN'S LUNG
13 TISSUE -- JUST TO GIVE US AN IDEA FOR SOMEONE THAT'S BEEN
14 DOING THIS ALL OF HIS LIFE AND KNOWS WHAT HE OR SHE IS
15 DOING -- HOW LONG DO YOU HAVE TO LOOK AT THE SLIDES BEFORE
16 YOU KNOW WHAT IT'S ALL ABOUT?

17 A. NOT VERY LONG. I MEAN, IT'S PRETTY OBVIOUS,
18 USUALLY, IN MOST CANCER CASES WHETHER IT'S CANCER OR NOT.
19 AND THERE ARE FAIRLY WELL-DEFINED CRITERIA FOR DIAGNOSING THE
20 FOUR MAJOR SUBTYPES OF LUNG CANCER, AND YOU CAN USUALLY
21 FIGURE THAT OUT PRETTY FAST.

22 Q. OKAY. LET'S START -- IF I COULD, LET ME GUIDE
23 YOU.

24 LET'S START WITH WHAT'S CANCER?

25 JUST A BRIEF, WHAT'S CANCER?

26 A. OKAY. CANCER IS A TYPE OF DISEASE PROCESS
27 THAT'S ALSO REFERRED TO AS A MALIGNANT NEOPLASM AND
28 NEOPLASM COMES FROM TWO WORDS. "NEO," MEANING NEW, AND

1 "PLASM, " MEANING GROWTH. SO A CANCER SYNONYMOUS WITH A
2 MALIGNANT NEW GROWTH.

3 AND IT IS A DISEASE CHARACTERIZED BY A
4 PROLIFERATION OF A CELL THAT NO LONGER IS UNDER NORMAL GROWTH
5 CONTROL MECHANISMS OF THE BODY. THAT MEANS IT IS AN IMMORTAL
6 CELL THAT CAN START DOUBLING AND GROWING IN A WAY THAT THE
7 BODY CANNOT CONTROL IT.

8 IT'S ALSO CHARACTERIZED BY TWO BAD THINGS. ONE
9 IS THAT AS THESE CANCER CELLS CONTINUE TO GROW, THEY START TO
10 UNDERGO ADDITIONAL GENETIC MUTATIONS, AND THEY ARE ABLE TO
11 INVADE NORMAL TISSUE BY PRODUCING ENZYMES THAT DIGEST THE
12 TISSUE THAT THEY ARE SURROUNDED BY.

13 THEY ALSO HAVE THE ABILITY TO INVADE INTO
14 LYMPHATIC CHANNELS, WHICH ARE CHANNELS WHICH CARRY THE LYMPH
15 IN THE BODY AND ALSO INTO BLOOD VESSELS, AGAIN, BY PRODUCING
16 THESE ENZYMES THAT DEGRADE THE WALLS OF THE BLOOD VESSELS AND
17 THE LYMPHATIC CHANNELS.

18 ONCE THEY GAIN ACCESS TO THE LYMPHATIC CHANNELS
19 OR THE BLOOD VASCULAR CHANNELS, THEY ARE THEN ABLE TO SPREAD
20 TO OTHER PARTS OF THE BODY, AND THAT PROCESS, WHICH IS
21 ANOTHER CHARACTERISTIC OF CANCER, IS CALLED METASTASES.

22 Q. THANK YOU. SO THAT'S WHAT CANCER IS.
23 WHAT'S LUNG CANCER?

24 A. LUNG CANCER IS A PRIMARY CANCER OF THE LUNG.
25 THAT MEANS IT ORIGINATED IN THE LUNG, AND THAT'S WHERE IT
26 CAME FROM

27 Q. LET ME JUST SHOW YOU THIS, AND I'M POINTING TO
28 THE TUMOR.

1 OF COURSE, YOU KNOW THAT'S WHERE IT IS?

2 A. RIGHT. IN THE RIGHT UPPER LOBE.

3 Q. HOW DID THAT COME TO BE?

4 DID THAT HAPPEN OVERNIGHT, OVER THE COURSE OF
5 THREE DAYS, OVER THE COURSE OF 50 YEARS, SOMETHING OTHER THAN
6 THOSE?

7 A. IT HAPPENED OVER A LONG TIME. AND THE CURRENT
8 CONCEPT OF CANCER IS RELATIVELY STRAIGHTFORWARD, AND THIS IS
9 THOUGHT TO APPLY TO BASICALLY EVERY TYPE OF SOLID CANCER
10 THERE IS IN THE BODY.

11 AND WHAT IT INVOLVES IS THAT THERE ARE
12 CARCINOGENS, SOME THAT WE KNOW OF AND SOME THAT WE DON'T,
13 THAT ARE ABLE TO CHANGE THE DNA IN CELLS. AND THE DNA IN
14 CELLS IS THE MATERIAL IN THE NUCLEUS THAT CONTROLS WHAT THE
15 CELL DOES.

16 AND THE WAY CARCINOGENS ACT ON THE DNA IS
17 PRIMARILY RELATED TO THREE TYPES OF GENES, AND GENES ARE MADE
18 UP OF DNA THAT DO CERTAIN THINGS OR TELL THE CELLS TO DO
19 CERTAIN THINGS.

20 AND ONE SET OF GENE IS REFERRED TO AS GENES
21 THAT CONTROL CELL GROWTH OR CELL REPLICATION, AND THOSE ARE
22 SCIENTIFICALLY CALLED PROTO-ONCOGENES. P-R-O-T-O, DASH,
23 ONCOGENES, O-N-C-O-G-E-N-E-S. "ONCO" MEANS CANCER, AND THEN
24 "GENES." SO IT'S A CANCER GENE.

25 AND THEN THEY ALSO HAVE AN EFFECT ON WHAT ARE
26 CALLED TUMOR SUPPRESSOR GENES. THOSE ARE SOMETIMES CALLED
27 ANTI-ONCOGENES. THEY CONTROL REGULATED CELL DEATH. AND THAT
28 IS, THAT ALL OF OUR CELLS IN OUR BODY THAT FORM THESE VARIOUS

1 TISSUES, LIKE OUR SKIN, OUR LUNGS, OUR HEART, THEY HAVE A
2 TURNOVER RATE. AND THAT TURNOVER RATE IS GENETICALLY
3 DETERMINED BY, BASICALLY, OUR BODIES GENETIC MAKEUP. SO
4 THOSE CELLS NORMALLY DIE AFTER A PERIOD OF TIME.

5 FOR EXAMPLE, A RED BLOOD CELL THAT COMES FROM
6 YOUR BONE MARROW, THAT SURVIVES 130 DAYS AND THEN IT DIES,
7 AND IT'S RELEASED BY ANOTHER ONE FROM THE BONE MARROW

8 YOUR SKIN, IT TAKES 28 DAYS FOR A CELL TO GET
9 FROM THE BOTTOM OF YOUR SKIN TO THE TOP YOUR SKIN. AND
10 THINGS LIKE THAT.

11 SO ANOTHER ASPECT OF CANCER IS A MUTATION OR
12 CHANGE IN THE GENES THAT CONTROL THIS CELL DEATH. AND THEN
13 THE THIRD MUTATION IS CHANGES IN THE GENE THAT TRY TO REPAIR
14 THESE OTHER DAMAGED GENES. AND THOSE ARE REFERRED TO AS
15 DNA-REPAIRED GENES. CANCER INVOLVES CHANGES IN THESE GENES.

16 AND WHAT USUALLY HAPPENS OVER A PERIOD OF
17 YEARS, WHERE A PERSON IS EXPOSED TO CARCINOGENS, BE IT
18 CIGARETTE SMOKE, ASBESTOS, BERYLLIUM, ARSENIC, WHATEVER, IS
19 THAT THESE SUBSTANCES ACT ON THOSE GENES, AND OVER A PERIOD
20 OF TIME, CAUSES THE CHANGES.

21 AND WHAT HAPPENS, AT LEAST FROM A PATHOLOGIST'S
22 POINT OF VIEW, IS THAT THE FIRST CHANGE THAT YOU SEE IN THE
23 TISSUE, IF YOU CAN EXAMINE IT, IS AN INCREASE NUMBER OF
24 CELLS, AND THAT PROCESS IS REFERRED TO AS HYPERPLASIA.
25 "HYPER" MEANS INCREASE; "PLASIA" MEANS NUMBER OF CELLS, AN
26 INCREASE IN THE NUMBER OF CELLS.

27 AND THEN IT WILL CONTINUE FROM THERE INTO
28 WHAT'S CALLED DYSPLASIA, IN WHICH THE CELLS START TO BECOME

1 ABNORMAL, AND THEY GET ABNORMAL DNA. AND THEN EVENTUALLY, IT
2 WILL GET INTO A PROCESS CALLED CARCINOMA IN SITU, WHICH MEANS
3 CANCER IN SITU, WHERE IT IS PRESENT IN THAT ORGAN BUT HAS NOT
4 YET INVADED. AND THEN IT WILL INVADE, AND THAT'S CALLED
5 INVASIVE CANCER.

6 AND THE BEST THING TO MAYBE ILLUSTRATE THIS, BY
7 WHICH I THINK MOST OF THE WOMEN WILL RELATE TO, IS THAT OF
8 CERVICAL CANCER. THEY GET PAP SMEARS TO DETECT THOSE
9 DYSPLASTIC CELLS OR CANCER IN SITU. SO IF THOSE ARE
10 DETECTED, THEN THEY CAN HAVE THAT AREA EXCISED AND THEIR
11 CANCER CAN BE ERADICATED BEFORE IT INVADES. AND HOW LONG
12 THIS TAKES CAN BE AS MANY AS 20, 30 YEARS FROM THE TIME A
13 PERSON IS FIRST EXPOSED TO A CARCINOGEN.

14 IN THIS PROCESS, IN SOLID CANCERS LIKE LUNG
15 CANCERS, KIDNEY CANCER, COLON CANCERS, BRAIN CANCERS,
16 WHATEVER, A SINGLE CELL IS ORIGINALLY FORMED THAT HAS THE
17 ABILITY TO ACT AS A CANCER CELL. AND IT UNDERGOES A CLONAL
18 PROLIFERATION, WHICH MEANS THAT IT STARTS TO DOUBLE ONE CELL
19 INTO TWO, TWO INTO FOUR, FOUR INTO EIGHT, EIGHT TO SIXTEEN,
20 ET CETERA, ET CETERA.

21 AND IT TAKES ABOUT 20 DOUBLINGS OF THOSE CELLS
22 TO PRODUCE A TUMOR THAT'S ONLY A MILLIMETER IN DIAMETER.
23 THAT WOULD BE ABOUT A 16TH OF AN INCH. AND DEPENDING ON THE
24 DOUBLING TIME -- THAT MEANS HOW FAST THE CANCER CELL'S
25 GROWING -- THAT COULD TAKE AS LONG AS MAYBE, SAY, FIVE TO TEN
26 YEARS.

27 AND THEN TO GET A TUMOR THAT'S, WHAT,
28 1 CENTIMETER IN DIAMETER -- WHAT, ABOUT, SAY, A LITTLE BIT --

1 ABOUT A HALF INCH IN DIAMETER, THAT TAKES 30 DOUBLINGS. AND
2 SO, SAY, AN ADENOCARCINOMA OF A LUNG WOULD BE AN AVERAGE
3 DOUBLING TIME OF ABOUT 100 DAYS. SO TO GET A TUMOR THAT
4 SIZE, 1 CENTIMETER, WOULD BE 30 TIMES 100, WHICH WOULD BE
5 3,000, DIVIDED BY 365 DAYS -- ABOUT EIGHT, NINE YEARS TO
6 PRODUCE A TUMOR THAT SIZE.

7 IT TURNS OUT THAT MOST LUNG CANCERS IN HUMANS
8 ARE DETECTED WHEN THEY'RE ABOUT THE SIZE OF A GOLF BALL,
9 ABOUT THREE TO THREE-AND-A-HALF CENTIMETERS IN DIAMETER. AND
10 BY THAT TIME, UNFORTUNATELY, THEY'VE ALREADY UNDERGONE ABOUT
11 35 DOUBLINGS, AND THEY HAVE COMPLETED WHAT IS REFERRED TO AS
12 THREE QUARTERS OF THEIR LIFE. WHICH MEANS THAT, IN MOST
13 PEOPLE, BY THE TIME A CANCER IS DETECTED IN THE LUNG, IT HAS
14 ALREADY BEEN THERE THREE QUARTERS OF ITS TOTAL LIFETIME, AND
15 THAT'S WHY LUNG CANCER IS SUCH A HARD DISEASE TO TREAT.

16 Q. IS IT SUCH A HARD DISEASE TO TREAT BECAUSE BY
17 THE TIME IT'S DISCOVERED, IT'S GOT SUCH A BIG FOOTHOLD THAT
18 IT'S TOO LATE?

19 A. EXACTLY.

20 Q. NOW I'M LOOKING AT THIS. I'M JUST GOING TO
21 FLASH IT AT YOU ONE MORE TIME. I'M LOOKING AT THIS
22 ILLUSTRATION. IT SAYS, "2 CENTIMETER MASS."

23 THERE ARE PLACES IN THE MEDICAL RECORDS,
24 ESPECIALLY THE PATHOLOGY RECORDS, WHICH DESCRIBE THIS AS
25 1-1/2 CENTIMETER MASS?

26 A. YES. PATHOLOGY SAID THE MAXIMUM DISEASE WAS
27 1.5 CENTIMETERS.

28 Q. DOES IT MATTER FOR ANY OPINION THAT YOU'RE

1 GOING TO GIVE HERE WHETHER IT'S ONE AND A HALF CENTIMETERS OR
2 TWO CENTIMETERS?

3 A. NO.

4 Q. WAS MR. BOEKEN'S TUMOR THAT WAS DISCOVERED --
5 WHETHER IT'S ONE AND A HALF OR TWO CENTIMETERS -- WAS IT
6 SMALLER THAN MOST LUNG CANCERS THAT ARE DISCOVERED?

7 A. YES.

8 Q. DO YOU HAVE AN IDEA WHY THAT WAS?

9 A. SURE.

10 Q. WHY?

11 A. WELL, IF YOU LOOK AT HIS CLINICAL RECORDS, HE
12 HAD BRONCHITIC SYMPTOMS, WHICH WOULD BE COUGH, EXCESS MUCOUS
13 PRODUCTION, WHICH IS A VERY COMMON SYMPTOM IN THE CIGARETTE
14 SMOKER. AND AT LEAST IN EARLY OCTOBER OF 1999, THERE WAS
15 SOME THOUGHT BY ONE PHYSICIAN THAT MAYBE HE WAS HAVING A
16 VIRAL SYNDROME OR VIRAL PROBLEM THAT WAS CAUSING AN EXCESS
17 NUMBER OF THESE BRONCHITIC-TYPE SYMPTOMS.

18 SO THAT PHYSICIAN ORDERED A CHEST RADIOGRAPH BE
19 TAKEN. AND A CHEST X-RAY WAS TAKEN, AND THAT X-RAY SHOWED A
20 MASS IN THE RIGHT UPPER LOBE. AND I WOULD CONSIDER THIS TO
21 BE, BASICALLY, AN INCIDENTAL FINDING AS A RESULT OF HIS
22 BRONCHITIC SYMPTOMS. I DON'T THINK THE SYMPTOMS HE HAD WERE
23 DIRECTLY RELATED TO THE LUNG CANCER. I THINK THE LUNG CANCER
24 WAS FOUND AS A RESULT OF THE X-RAY BEING TAKEN FOR THESE
25 OTHER SYMPTOMS.

26 Q. SO THE LUNG CANCER WAS SORT OF FOUND BY
27 ACCIDENT?

28 A. BY ACCIDENT, YES.

1 Q. AND BECAUSE IT WAS FOUND BY ACCIDENT, IT WAS
2 FOUND A LITTLE EARLIER THAN NORMAL?

3 A. YES.

4 Q. OKAY. THANK YOU.

5 LET'S JUST GO BACK TO THE TIMING AGAIN. I
6 APPRECIATE YOUR EXPLANATION, BUT A BOTTOM LINE -- RIGHT
7 TOWARD THE END, I THINK YOU GAVE A BOTTOM LINE.

8 WAS IT SOMETHING IN THE VICINITY OF FIVE OR SIX
9 OR SEVEN, OR SOMETHING IN THAT ORDER OF YEARS, FOR THIS
10 TUMDR, ONCE IT BEGAN, TO GROW THE SIZE THAT IT DID?

11 A. YES.

12 Q. AND PRIOR TO THOSE FIVE OR SIX OR SEVEN YEARS,
13 DID IT TAKE DECADES FOR WHATEVER WAS INITIALLY HAPPENING TO
14 SET THE STAGE FOR THE TUMDR?

15 A. IT DID.

16 IF YOU -- YOU KNOW, MR. BOEKEN WAS BORN IN
17 1944, AND HE STARTED SMOKING REGULARLY AT AGE 14, SO THAT
18 WOULD BE 1958. SO IF THAT WAS -- IF THAT WAS THE TIME -- YOU
19 USED TO SAY THAT THAT WAS THE INITIAL INTRODUCTION OF THE
20 CARCINOGEN. THAT WOULD HAVE BEEN THE INITIATION OF THE
21 CELLULAR CHANGES THAT EVENTUALLY LED TO THE DEVELOPMENT OF A
22 SINGLE CANCER CELL THAT THEN PROLIFERATED TO FORM THAT MASS.

23 SO 1958 TO 1999 -- THAT WOULD BE 41 YEARS --
24 WOULD BE THE TOTAL LATENT PERIOD, WHICH IS THE TIME FROM
25 EXPOSURE TO THE FIRST CARCINOGENIC EXPOSURE TO THE TIME HE
26 WAS DIAGNOSED WITH THE TUMDR. AND A SIGNIFICANT AMOUNT OF
27 THAT TIME, MAYBE AS MUCH AS 20 PLUS YEARS, MAYBE 30 YEARS,
28 WOULD HAVE BEEN THE CELLAR CHANGES TAKING PLACE THAT LED TO

1 THE DEVELOPMENT OF THE FIRST CANCER CELL.

2 Q. THANK YOU.

3 IF MR. BOEKEN'S TUMOR -- AND I WANT TO POINT
4 OUT TO YOU, NOT THREE CENTIMETERS, BUT ONE AND A HALF TO TWO
5 CENTIMETERS, IN THAT GENERAL AREA -- IF IT TOOK -- IF IT WAS
6 DIAGNOSED IN 1999, WHEN DO YOU THINK IT STARTED GROWING, THE
7 TUMOR?

8 NOT ALL OF THE CELLULAR CHANGES AND ALL THE
9 DECADES LEADING UP, BUT THE TUMOR ITSELF?

10 A. WELL, BEST ESTIMATE YOU WOULD HAVE WOULD BE --
11 USING 100 DAYS AS DOUBLING TIME -- AND THAT'S BASED ON SOME
12 INFORMATION THAT IS REFERENCED IN THE BOOK I WAS TALKING
13 ABOUT, DOUBLING TIMES THAT HAVE BEEN CALCULATED FOR LUNG
14 CANCERS.

15 AND, OKAY. AND SAY, 20 DOUBLINGS, 30 DOUBLINGS
16 TO PRODUCE 1 CENTIMETER. SO 30 TIMES 100, AGAIN, WOULD BE
17 3,000. AND HIS WAS 1.5 CENTIMETERS. SO THAT WE'LL JUST SAY,
18 SAY, 33 DOUBLINGS -- 33 DOUBLINGS TIMES 100 WOULD BE 3,300
19 DAYS. TEN YEARS PROBABLY WOULD BE A GOOD NUMBER. AND SO
20 THAT WOULD BE IN 1989. 1989 WOULD BE PROBABLY WHEN THE FIRST
21 CANCER'S FORMED THAT STARTED TO PROLIFERATE TO FORM THAT
22 MASS.

23 Q. OKAY. SO WOULD IT BE -- WOULD YOU TELL ME --
24 IF THAT'S TRUE, WOULD THAT MEAN THAT IN 1989, HE ALREADY HAD
25 LUNG CANCER?

26 A. SURE. THAT'S EXACTLY RIGHT.

27 AND THAT'S WHAT'S NOW BEING DONE BY SOME
28 STUDIES NOW THAT THEY ARE TRYING TO DO ON PEOPLE THAT ARE

1 SMOKERS; TO TRY TO DETECT EARLY CANCERS.

2 AND THERE' S BEEN TWO APPROACHES. ONE WOULD BE
3 WHAT' S CALLED SPIRAL CT SCANS TO TRY TO DETECT EARLY CANCER.
4 BUT ANOTHER ONE IS FROM THE MOLECULAR BIOLOGY, AND THAT IS TO
5 TRY TO GET A SAMPLE OF SPUTUM OR A SECRETION FROM DEEP IN THE
6 LUNG TO SEE IF YOU CAN DETECT THE EARLY GENETIC CHANGES IN
7 CELLS THAT WILL EVENTUALLY GIVE RISE TO CANCER.

8 AND IF YOU CAN, THEN, SOMEHOW VERY CAREFULLY
9 FOLLOW THOSE PEOPLE IN ANY WAY YOU CAN TO DETECT, SAY, AN
10 EARLY LUNG CANCER THAT CAN BE SURGICALLY TREATED AND CAN,
11 HOPEFULLY, BE CURED.

12 Q. THANK YOU.

13 NOW, YOU TALKED ABOUT CANCER -- WE TALKED ABOUT
14 LUNG CANCER. LET' S TALK ABOUT SOME TYPES OF LUNG CANCER.
15 ARE YOU READY TO DO THAT?

16 A. SURE.

17 Q. FOR OPENERS, ARE THERE TWO MAJOR SORT OF
18 CLASSIFICATIONS; SMALL CELL, LARGE CELL?

19 A. THERE ARE USUALLY A SMALL CELL AND NON-SMALL
20 CELL.

21 Q. EXCUSE ME. I' VE SPENT ZERO DAYS AS A
22 PATHOLOGIST.

23 A. THE REASON THAT THERE' S THAT CLASSIFICATION IS
24 VERY, VERY SIMPLE.

25 SMALL CELL LUNG CANCER IS NOT A SURGICALLY
26 TREATED DISEASE. IT' S TREATED WITH COMBINING THINGS LIKE
27 CHEMOTHERAPY AND RADIATION THERAPY. VERY SPECIFIC TREATMENT.
28 IT WILL DEPEND ON WHETHER IT' S CALLED A LOCALIZED DISEASE OR

1 EXTENSIVE DISEASE.

2 NON-SMALL CELL CANCER IS EVERYTHING ELSE. AND
3 THAT ALSO HAS SOME FAIRLY WELL-DEFINED TREATMENT, BUT IT'S
4 BASICALLY ALL THE SAME FOR ALL OF THEM WITH THE EXCEPTION
5 THAT MAYBE IF A PATIENT HAD A TYPE OF CANCER CALLED SQUAMOUS,
6 S-Q-U-A-M-O-U-S, TYPE CANCER, WHICH IS USUALLY IN THE CENTER
7 PART OF THE LUNG HERE, THAT MIGHT BE TREATED WITH RADIATION
8 ONLY. ANYTHING ELSE IS BASICALLY GOING TO GET CHEM, AND
9 SOME INSTANCES, RADIATION, DEPENDING ON WHAT THE ANATOMIC
10 STAGE OF THE DISEASE WILL BE.

11 Q. THANK YOU.

12 LET ME BACK YOU UP JUST A BIT.

13 SMALL CELL AND NON-SMALL CELL ARE THE TWO MAJOR
14 CATEGORIES.

15 DID MR. BOEKEN HAVE SMALL CELL OR NON-SMALL
16 CELL?

17 A. NON-SMALL CELL.

18 Q. WE CAN FORGET ABOUT SMALL CELL, THEN, RIGHT?

19 A. YES.

20 Q. OKAY. WHEN WE GET TO NON-SMALL CELL, ARE THERE
21 DIFFERENT SUBCATEGORIES OF NON-SMALL CELL LUNG CANCER?

22 A. THREE MAJOR SUBCATEGORIES.

23 Q. PLEASE.

24 A. ADENOCARCINOMA IS THE MOST COMMON.

25 NEXT MOST COMMON WOULD BE SQUAMOUS CARCINOMA.

26 AND THE LEAST COMMON WOULD BE WHAT'S CALLED
27 LARGE-CELL UNDIFFERENTIATED CARCINOMA.

28 Q. WHEN YOU SAY ADENOCARCINOMA IS THE MOST COMMON,

1 GIVE US AN IDEA IN PERCENTAGES, COULD YOU, PLEASE?

2 A. AT THIS POINT IN TIME, PROBABLY 40 OR 45
3 PERCENT OF ALL LUNG CANCER.

4 Q. AND OF THE LUNG CANCERS, WE ALREADY GOT RID OF
5 NON-SMALL CELLS.

6 HAVING GOT RID OF THOSE, WHAT PERCENTAGE OF THE
7 SMALL CELL LUNG CANCERS ARE ABNORMAL?

8 A. ZERO. SMALL CELLS, BY DEFINITION, IS A VERY
9 SPECIFIC TYPE OF CANCER, WHICH IS DERIVED FROM WHAT'S CALLED
10 A NEUROENDOCRINE CELL THAT PRODUCES A LOT OF DIFFERENT
11 HORMONES AND GROWTH FACTORS. IT'S A TUMOR THAT HAS GOT THE
12 FASTEST GROWTH RATE. SOME OF THEM HAVE DOUBLED EVERY THREE
13 DAYS. IT'S A TUMOR THAT CAN CAUSE ALL KINDS OF VERY FAST,
14 BAD THINGS TO HAPPEN TO YOU.

15 Q. I MISPOKE. WHAT I MEANT TO SAY IS: WHAT
16 PERCENTAGE OF NON-SMALL CELL LUNG CANCERS ARE ABNORMAL?

17 A. OH, OKAY. NON-SMALL CELL.

18 AGAIN, IT WOULD BE IN THE NEIGHBORHOOD OF
19 40 TO 45 PERCENT.

20 Q. FINE. THANK YOU.

21 WHAT DID MR. BOEKEN HAVE?

22 A. HE HAD ADENOCARCINOMA.

23 Q. IS THERE SOME SORT OF A DEFINITION THAT
24 SPECIALISTS LIKE YOU USE TO SAY THIS TUMOR FITS IN THIS SLOT
25 AND THIS TUMOR FITS IN THIS SLOT AND THIS TUMOR FITS IN THIS
26 SLOT?

27 A. SURE.

28 Q. WHAT'S THE DEFINITION FOR ADENOCARCINOMA,

1 PLEASE?

2 A. AN ADENOCARCINOMA IS A TYPE OF CANCER, AND IT
3 CAN APPLY TO THE LUNG OR ANYWHERE IN WHICH THE CELLS ARE
4 FORMING WHAT ARE CALLED GLANDULAR OR TUBULAR STRUCTURES,
5 WHICH ARE LITTLE ROUND STRUCTURES HERE. AND THEY USUALLY
6 SECRETE SUBSTANCES, OR THE OTHER CRITERIA IS THAT THEY
7 PRODUCE MUCOUS, AND THOSE ARE THE TWO PRIMARY CRITERIA FOR
8 DIAGNOSING ADENOCARCINOMA, BASICALLY, ANYWHERE IN THE BODY.

9 Q. SO WE'VE GONE CANCER, LUNG CANCER, NON-SMALL
10 CELL CANCER, ADENOCARCINOMA?

11 A. RIGHT.

12 Q. ARE THERE SUBGROUPS OF THAT, TOO?

13 A. THERE ARE. THERE'S SEVERAL SUBGROUPS OF
14 ADENOCARCINOMA IN THE LUNG. FOR EXAMPLE -- AND THAT'S KIND
15 OF WHAT I KNOW AS A PATHOLOGIST. ALTHOUGH, FROM A PRACTICAL
16 POINT OF VIEW, IT DOESN'T MAKE MUCH DIFFERENCE.

17 Q. LET'S STAY WITH THAT FOR A SECOND.

18 WHEN YOU SAY, FOR PRACTICAL -- OR FROM A
19 PRACTICAL STANDPOINT, IT DOESN'T MAKE MUCH DIFFERENCE, WHAT
20 DO YOU MEAN?

21 A. I MEAN THAT IF YOU LOOK AT WHAT HAPPENS TO
22 PEOPLE THAT ARE, SAY, DIAGNOSED WITH ADENOCARCINOMA, MAYBE BY
23 A TRANSBRONCHIAL BIOPSY OR A PURE CUTANEOUS NEEDLE BIOPSY,
24 THE TREATMENT IS BASICALLY THE SAME.

25 AND THE INITIAL TREATMENT WOULD BE TO DETERMINE
26 WHETHER THERE IS ANY EVIDENCE OF METASTASIS FROM THE PRIMARY
27 SOURCE TO A DISTANT SOURCE. AND IF THERE ARE NO METASTASES,
28 THE NEXT CONSIDERATION WOULD BE TO DETERMINE IF THE PERSON

1 WAS AN OPERATIVE CANDIDATE. DID THE PERSON HAVE ENOUGH
2 PULMONARY RESERVE TO UNDERGO A RESECTION OF THE LUNG.

3 Q. "RESECTION," MEANING?

4 A. CUT OUT THE PART OF THE LUNG WHERE THE TUMOR
5 WAS.

6 Q. OKAY.

7 A. AND THE NEXT THING WOULD BE TO -- SOMETIMES,
8 THEY'LL DO A BUNCH OF SOPHISTICATED SCANS, WHICH IS ANOTHER
9 WAY OF STAGING, WHICH THEY'LL DETERMINE, BY WHAT'S CALLED A
10 PET SCAN -- P-E-T, CAPITALIZED -- WHETHER OR NOT THERE'S ANY
11 ACTIVITY IN AREAS THAT YOU MIGHT NOT BE ABLE TO SEE WITH SOME
12 ORDINARY RADIOGRAPHIC TECHNIQUES, AND THEY CAN THEN --

13 THE NEXT PROCEDURE WOULD USUALLY BE TO TAKE THE
14 PERSON TO THE OPERATING ROOM AND EITHER DO WHAT'S CALLED AN
15 ARTHROSCOPIC PROCEDURE OR THORACOTOMY.

16 IN AN ARTHROSCOPIC PROCEDURE, THERE'S --
17 LIMITED TYPE OF INCISIONS ARE MADE, AND YOU CAN DO THINGS
18 THROUGH WHAT'S CALLED AN ARTHROSCOPE.

19 IN THE THORACOTOMY, YOU WOULD ACTUALLY OPEN UP
20 THE PATIENT AND GET INSIDE OF THE CHEST. FREQUENTLY, THAT IS
21 PRECEDED BY WHAT'S CALLED A MEDIASTINOSCOPY, IN WHICH YOU PUT
22 A TUBE RIGHT UNDERNEATH THE BREAST BONE HERE AND GO DOWN
23 UNDERNEATH THE STERNUM, AND YOU PLUCK LYMPH NODES OUT FROM
24 THAT AREA. AND YOU WOULD SEND THOSE TO A PATHOLOGIST, LIKE
25 MYSELF, TO SEE WHETHER THERE'S ANY METASTATIC CANCER.

26 IF THERE WAS METASTATIC CANCER, THE SURGERY
27 WOULD BE TERMINATED. IF THERE WAS NOT, THEN THE PERSON WOULD
28 GO TO THORACOSCOPY OR THORACOTOMY, AND THE TUMOR WOULD BE

1 RESECTED. USUALLY, IF IT WAS NOT INVOLVING WHAT'S CALLED THE
2 HILUM OF THE LUNG, IT WOULD BE RESECTED JUST WITH WHAT LOBE
3 IT WAS IN.

4 LIKE IF IT WAS IN THE RIGHT UPPER LOBE, LIKE
5 MR. BOSKY -- NOT ABOUT MR. BOSKY -- MR. BOEKEN, IT WOULD BE
6 RESECTED, IN WHICH THE ENTIRE RIGHT UPPER LOBE WOULD BE
7 REMOVED WITH THE TUMOR.

8 IF THE TUMOR WAS AT THE HILUM, BUT THERE'S
9 STILL A MARGIN, THEY MIGHT TAKE OUT THE ENTIRE RIGHT LUNG.

10 Q. WHAT'S THE HILUM?

11 IS THAT LIKE THE DIFFERENCE BETWEEN
12 SAN FRANCISCO AND LOS ANGELES, RIGHT DOWN THE MIDDLE THERE?

13 A. IT'S RIGHT -- IF YOU'D TURN THAT THING AROUND.
14 IT'S RIGHT -- YOU CAN SEE THERE WHERE THE TUBE COMES DOWN
15 WHERE IT SAYS THE TRACHEA, AND THEN IT GOES INTO ONE TUBE ON
16 THE ONE SIDE AND ONE ON THE OTHER. WHERE THAT TUBE ENTERS
17 THE LUNG IS CALLED THE HILUM

18 Q. RIGHT THERE?

19 A. RIGHT THERE. YEAH.

20 IF THERE'S A TUMOR THERE THAT WAS CLOSE TO
21 THAT, BUT YET THEY COULD GET A MARGIN, THEY COULD CUT OFF
22 ENOUGH OF THAT BRONCHUS WITHOUT HAVING TO GET TO THE TRACHEA,
23 AND THEY COULD GET A STAPLE ACROSS IT, THEY COULD TAKE OUT A
24 TUMOR BY CUTTING IT THERE AND TAKING OUT THE ENTIRE LUNG.

25 IN MR. BOEKEN'S CASE, ALL THEY HAD TO DO WAS
26 TAKE OUT THE MASS IN THE RIGHT UPPER LOBE AND THEN RESECT THE
27 REST OF THE LOBE.

28 Q. THANK YOU.

1 AS PART OF THAT ANSWER, ONE OF THE THINGS YOU
2 SAID IS LYMPH NODES ARE TAKEN, SENT TO A DOCTOR LIKE YOU, AND
3 IF THERE'S NO METASTATIC DISEASE, THEN THE SURGERY CAN GO.

4 WHAT IF THERE IS METASTATIC DISEASE?

5 A. IF THERE'S METASTATIC DISEASE, THEN THE TUMOR
6 WOULD BE CONSIDERED, AS TO THE LYMPH NODE, AS N-2 DISEASE,
7 WHICH THERE IS MEDIASTINAL LYMPH NODES, AND THAT WOULD BE A
8 CONTRAINDICATION TO DO ANY FURTHER SURGERY BECAUSE WHAT'S
9 BEEN FOUND IS, IF YOU HAVE METASTASES TO THOSE LYMPH NODES,
10 SURGERY DOESN'T BENEFIT SURVIVAL.

11 Q. IN OTHER WORDS, IF IT'S ALREADY METASTASIZED TO
12 THOSE LYMPH NODES, YOU'RE CLOSING THE BARN DOOR AFTER THE
13 HORSE OR COW OR WHATEVER HAS GONE?

14 A. THAT'S RIGHT.

15 Q. THANKS.

16 NOW, HERE'S HOW WE GOT INTO THAT SUBJECT. I
17 WAS ASKING YOU ABOUT SUBCATEGORIES OF ADENOCARCINOMA OF THE
18 LUNG, AND I THINK YOU STARTED OUT IN YOUR ANSWER BY SAYING IT
19 DOESN'T REALLY MATTER IN TREATMENT, BUT TO PEOPLE LIKE YOU,
20 IT MIGHT MATTER.

21 DID YOU SAY THAT?

22 A. I DID SAY THAT.

23 Q. WHAT DO YOU MEAN BY THAT, PLEASE?

24 A. I MEAN, PATHOLOGISTS LOVE TO LOOK AT CANCERS
25 AND LOVE TO LOOK AT CELLS, AND THAT'S KIND OF WHAT WE DO FOR
26 A LIVING. AND WHAT WE LIKE TO DO IS SUBCLASSIFY EVERYTHING
27 ACCORDING TO THE APPEARANCE OF THE CANCER CELLS AND THE
28 VARIOUS TYPES OF STRUCTURES THEY FORM

1 SO IN THE CASE OF LUNG CANCER, THERE ARE FOUR
2 MAJOR SUBTYPES. THERE'S PAPILLARY ADENOCARCINOMA; THERE'S A
3 BRONCHIOLOALVEOLAR CELL CARCINOMA; THERE IS ACINAR
4 ADENOCARCINOMA OF THE LUNG; AND THERE IS WHAT'S CALLED A
5 SOLID ADENOCARCINOMA OF THE LUNG, WHICH IS DEFINED AS ONE
6 WHERE THE GROWTH PATTERN IS COMPOSED OF CELLS THAT ARE IN A
7 SOLID SHEET, BUT YOU CAN IDENTIFY MUCUS PRODUCTION BY THOSE
8 CELLS.

9 Q. IS THERE SOME OFFICIAL PLACE -- IF I WANTED TO
10 LOOK UP A LEGAL TERM, I GUESS I COULD FIGURE OUT WHERE TO GO
11 TO LOOK UP LEGAL TERMS -- TO LOOK UP DEFINITIONS OF THESE
12 TYPES OF CANCERS?

13 IS THERE A PLACE TO GO?

14 A. SURE.

15 Q. WHERE?

16 A. YOU COULD GO TO THE WORLD HEALTH ORGANIZATION
17 CLASSIFICATION OF LUNG CANCERS AND MESOTHELIOMAS. OR GO TO A
18 BOOK LIKE MINE WHICH WOULD HAVE THE LAST WHO CLASSIFICATION
19 IN IT PRIOR TO THE MORE CURRENT ONE. THAT WOULD BE THE MOST
20 FREQUENT PLACES TO LOOK.

21 YOU COULD PROBABLY ALSO GO TO A CANCER MEDICINE
22 TEXTBOOK AND FIND CLASSIFICATION OF LUNG CANCER THERE, WHICH
23 MAY NOT BE AS DETAILED AS A PATHOLOGY BOOK.

24 Q. THANK YOU.

25 I WANT TO TALK MORE ABOUT YOUR QUALIFICATIONS
26 NOW, AND I HOPE I ASK THE RIGHT QUESTIONS.

27 LET'S START WITH THE WHO. WHAT IS THE WHO?

28 A. IT STANDS FOR THE WORLD HEALTH ORGANIZATION.

1 Q. WHEN IS THE LAST TIME THAT THE WORLD HEALTH
2 ORGANIZATION CLASSIFIED THE SUBTYPES OF ADENOCARCINOMA?

3 A. PRIOR TO THE MOST RECENT ONE, IT WOULD BE 1981.

4 Q. WHEN WAS THE MOST RECENT ONE?

5 A. 1999.

6 Q. DID YOU HAVE SOMETHING TO DO WITH THE WORLD
7 HEALTH ORGANIZATION'S EFFORTS TO CLASSIFY SUBTYPES OF
8 ADENOCARCINOMA IN 1999?

9 A. YES.

10 Q. TELL US WHAT, PLEASE?

11 A. I WAS A MEMBER OF A PANEL OF PATHOLOGISTS FROM
12 VARIOUS COUNTRIES IN THE WORLD THAT MET OVER ABOUT A
13 THREE-YEAR PERIOD TO HASH OUT THE MOST RECENT CLASSIFICATION.

14 Q. NOW, UNDER THE MOST RECENT CLASSIFICATION, WHAT
15 IS MR. BOEKEN'S DIAGNOSIS -- NOT JUST CANCER, AND NOT JUST
16 LUNG CANCER, OR NOT JUST ADENOCARCINOMA -- BUT WHAT ARE THE
17 SUBCLASSIFICATIONS?

18 A. HE WOULD HAVE ADENOCARCINOMA WITH AREAS OF
19 PAPILLARY DIFFERENTIATION, AREAS OF BRONCHIOALVEOLAR CELL
20 GROWTH PATTERN AND THE METASTASIS, A SOLID GROWTH PATTERN, A
21 SIGNET-RING TYPE OF FORMATION.

22 Q. THAT'S A MOUTHFUL.

23 A. YEAH.

24 Q. IT SOUNDS LIKE HIS ADENOCARCINOMA HAD A LITTLE
25 BIT OF ALL THE SUBTYPES?

26 A. IT DID. I FORGOT, HIS ALSO HAS ACINAR
27 DIFFERENTIATION.

28 Q. IS IT COMMON OR UNCOMMON FOR ADENOCARCINOMA OF

1 THE LUNG TO HAVE A MIX OF DIFFERENT SUBCLASSIFICATIONS?

2 A. IT'S VERY COMMON. THAT'S WHAT YOU SEE IN THE
3 VAST MAJORITY OF THEM

4 Q. THAT'S NOT WHAT I SEE IN ANY.
5 IS THAT WHAT YOU SEE IN THE VAST MAJORITY?

6 A. THAT'S WHAT I SEE IN MOST OF THEM

7 Q. AS FAR AS THE LITERATURE IS CONCERNED,
8 INCLUDING THE WORLD HEALTH ORGANIZATION CLASSIFICATIONS, IS
9 THAT WHAT THOSE SPECIALISTS SEE, TOO?

10 A. YES. IF YOU LOOK AT THE SECTION IN THE WHO
11 BOOK, IT WILL SAY EXACTLY THAT; THAT MOST ADENOCARCINOMA SHOW
12 VARIOUS PATTERNS OF DIFFERENTIATION.

13 Q. ALL RIGHT. THANK YOU.

14 WE MAY BE HEARING LATER IN THE TRIAL SOMETHING
15 ABOUT A FASCICLE.

16 DO YOU KNOW WHAT A FASCICLE IS?

17 A. YES.

18 Q. CAN YOU SPELL IT FOR THE COURT REPORTER?

19 A. YES. F-A-S-C-I-C-L-E.

20 Q. WHAT IS IT?

21 A. WELL, PATHOLOGISTS, WHEN THEY HEAR THE WORD
22 FASCICLE -- AND IT PROBABLY HAS A VERY DISTINCT
23 DEFINITION -- BUT IT REFERS TO A PUBLICATION BY THE ARMED
24 FORCES INSTITUTE OF PATHOLOGY, WHICH IS KIND OF A WORLD
25 FAMOUS PATHOLOGY INSTITUTE THAT OVER THE YEARS HAD PRODUCED
26 THESE DOCUMENTS WHICH ARE IN THE FORM OF BOOKS, BUT THEY'RE
27 USUALLY LOOSE-LEAF, AND THEY'RE USUALLY MORE LIKE PAPER SIZE,
28 SAY, 11 BY -- OH, WHATEVER THE SIZE OF A STANDARD -- THIS

1 SIZE RIGHT HERE.

2 AND WHAT THEY DO, THEY ARE WRITTEN BY PEOPLE
3 WHO ARE CONSIDERED EXPERTS IN THE AREA AND THEY ARE WRITTEN
4 ABOUT CERTAIN TYPES OF TUMORS. FOR EXAMPLE, THERE'S ONE ON
5 LUNG CANCERS. THERE'S ONE ON MESOTHELIOMA. THERE'S ONE ON
6 CANCER OF THE KIDNEY. THERE'S ONE ON CANCER OF THE HEAD AND
7 NECK. ONE IS SOFT TISSUE CANCERS. BASICALLY, EVERYTHING YOU
8 CAN THINK OF. AND THOSE PUBLICATIONS ARE USED WORLDWIDE BY
9 PATHOLOGISTS TO HELP THEM IN THEIR DAILY WORK OF CLASSIFYING
10 TUMORS.

11 Q. THANK YOU.

12 NOW, I'M INTERESTED -- THIS IS THE U.S. ARMED
13 FORCES FASCICLE?

14 A. YES.

15 Q. I'M INTERESTED, OBVIOUSLY, IN ANY ON LUNG
16 CANCER HERE.

17 ARE YOU FAMILIAR WITH THE U.S. ARMED FORCES
18 FASCICLES ON LUNG CANCER?

19 A. SURE.

20 Q. WHO WROTE THOSE?

21 A. THERE'S ONLY ONE. THE MOST CURRENT ONE WAS
22 WRITTEN BY THREE FRIENDS OF MINE. BILL TRAVIS IS AT THE
23 AIFP. MICHAEL KOSS -- T-R-A-V-I-S -- MICHAEL KOSS, K-O-S-S,
24 WHO NOW IS A PATHOLOGIST HERE WORKING IN LOS ANGELES. HIS
25 WIFE IS A MICROBIOLOGIST. AND THE OTHER WRITER, AUTHOR, WAS
26 A PERSON BY THE NAME OF THOMAS COLBY, C-O-L-B-Y, AND
27 DR. COLBY IS A PATHOLOGIST AT THE MAYO CLINIC IN
28 SCOTTSDALE, ARIZONA.

1 Q. I WANT TO TALK ABOUT TWO OF THE THREE.
2 AS FAR AS DR. TRAVIS IS -- WELL, LET'S TALK
3 ABOUT DR. COLBY FIRST.

4 HAVE YOU AND DR. COLBY WRITTEN OR EDITED
5 TOGETHER?

6 A. YES.

7 Q. WHAT WOULD THAT BE, PLEASE?

8 A. WE WROTE A BOOK THAT I HAVE HERE. IT'S CALLED,
9 "PULMONARY PATHOLOGY TUMORS," WHICH IS A BOOK ON THE TUMORS
10 OF THE LUNG. AND DR. COLBY, MYSELF AND A DR. DAVID DAIL,
11 D-A-I-L, WERE THE EDITORS OF THAT BOOK AND AUTHORS.

12 Q. SO THIS?

13 A. YES.

14 Q. OKAY. SO OF THE THREE AUTHORS HERE, I JUST
15 WANT TO CONCENTRATE -- NO OFFENSE TO DR. DAIL.

16 A. OKAY.

17 Q. I JUST WANT TO CONCENTRATE ON TWO FOR NOW
18 YOU'RE HAMMER. COLBY IS ONE OF THE PEOPLE THAT
19 WROTE THE ARMED FORCES FASCICLE ON LUNG CANCER?

20 A. YES.

21 Q. OKAY. DID YOU AND DR. COLBY ALSO SERVE
22 TOGETHER ON A U.S. AND CANADIAN EFFORT THAT HAD SOMETHING TO
23 DO WITH CANCER?

24 A. YES.

25 Q. TELL US WHAT THE EFFORT WAS AND WHAT IT IS THAT
26 THE TWO OF YOU DO, PLEASE?

27 A. WELL, DR. COLBY AND I HAVE SERVED ON A U.S. AND
28 CANADIAN MESOTHELIOMA PANEL WHICH IS A PANEL THAT REVIEWS

1 SUSPECT CASES OF MESOTHELIOMA AT NO CHARGE FOR OTHER
2 PATHOLOGISTS.

3 AND DR. COLBY AND I WERE BOTH ON THE
4 INTERNATIONAL GROUP OF PATHOLOGISTS THAT SERVE TO WRITE THE
5 CURRENT WHO CLASSIFICATION OF LUNG CANCER.

6 Q. NOW, WERE YOU ANSWERING AS TO DR. COLBY JUST
7 THEN?

8 A. YES.

9 Q. BECAUSE I WAS THINKING AHEAD. THANK YOU.

10 DR. TRAVIS. DID YOU ALSO SERVE WITH DR. TRAVIS
11 ON THE SAME U. S. /CANADIAN PANEL DEALING WITH MESOTHELIOMA?

12 A. YES. HE'S A MEMBER OF THAT PANEL, ALSO.

13 Q. DO YOU AND DR. TRAVIS HAVE SOMETHING IN COMMON
14 AS FAR AS ANOTHER ORGANIZATION THAT THE JURY SHOULD HEAR
15 ABOUT?

16 A. YES.

17 Q. WHAT IS THAT, PLEASE?

18 A. THE PULMONARY PATHOLOGY SOCIETY.

19 Q. WHAT DO YOU HAVE IN COMMON WITH THEM?

20 A. THE PULMONARY PATHOLOGY SOCIETY IS AN
21 INTERNATIONAL SOCIETY DEVOTED TO THE STUDY OF LUNG DISEASES
22 FROM A PATHOLOGIST'S PERSPECTIVE. AND WHEN IT WAS FIRST
23 FORMED, DR. COLBY WAS THE PRESIDENT, I WAS THE
24 VICE-PRESIDENT, DR. TRAVIS WAS THE SECRETARY. SO WE BOTH
25 HAVE BEEN IN THE EXECUTIVE BRANCH, SO TO SPEAK, OF THAT
26 ORGANIZATION.

27 Q. DID YOU EVER GET TO BE PRESIDENT OF IT?

28 A. I DID.

1 Q. YOU'RE FAMILIAR WITH THE U. S. ARMED FORCES
2 FASCICLE ON LUNG CANCER?

3 A. YES.

4 Q. AS FAR AS THOSE DOCUMENTS ARE CONCERNED, USING
5 THE DEFINITION THERE, WHAT KIND OF ADENOCARCINOMA DOES
6 MR. BOEKEN HAVE?

7 A. HE WOULD HAVE ADENOCARCINOMA OF THE MIX-CELL
8 TYPE OR SHOWING VARIABLE DIFFERENTIATION.

9 Q. NOW, WHY DID THE WORLD HEALTH ORGANIZATION
10 RECLASSIFY LUNG TUMORS IN 1999 AFTER ALREADY HAVING DONE IT
11 ONCE IN 1981?

12 A. WELL, BECAUSE THERE ARE CERTAIN CHANGES, AND
13 THE CHANGES, PROBABLY IN THE AREA OF ADENOCARCINOMA, AND THE
14 OTHER CHANGE WOULD BE PRIMARILY IN THE GROUP OF TUMORS OF THE
15 LUNG REFERRED TO AS NEUROENDOCRINE TUMORS, ESPECIALLY THREE
16 NEW TUMORS OR TWO NEW ENTITIES THAT HAD NOT BEEN PREVIOUSLY
17 DESCRIBED.

18 ONE WAS CALLED A LARGE-CELL NEUROENDOCRINE
19 CARCINOMA. AND THE OTHER IS CALLED AN ATYPICAL CARCINOMA.
20 AND THE REASON THAT THAT WAS DEFINED IS, A LOT OF
21 PATHOLOGISTS DIDN'T UNDERSTAND WHAT THOSE ENTITIES WERE, AND
22 THIS HAS BEEN SOMETHING THAT HAS BEEN PUBLISHED SINCE 1981
23 AND, ACTUALLY, HAS BEEN PUBLISHED ONLY ABOUT THE LAST FIVE TO
24 SIX YEARS.

25 Q. NOW, DO YOU HAVE -- DO YOU HAVE SOME SLIDES
26 THAT WE CAN TAKE A LOOK AT THAT YOU CAN SHOW THE JURY AND
27 DISCUSS MR. BOEKEN'S TUMOR?

28 A. I DO.

1 Q. BEFORE YOU DO, I WANT TO SHOW ONE MORE THING, I
2 GUESS.

3 HERE'S A PAGE OR, ACTUALLY, PART OF A PAGE FROM
4 A THREE-PAGE -- I THINK IT'S THREE -- PATHOLOGY REPORT FROM
5 CEDARS-SINAI HOSPITAL.

6 ARE YOU FAMILIAR WITH THAT REPORT?

7 A. YES.

8 Q. THE DIAGNOSIS HERE, IT SAYS (READING):

9

10 "RIGHT UPPER LOBE WEDGE

11 RESECTION.

12 "PAPILLARY ADENOCARCINOMA OF

13 THE LUNG.

14 "MODERATELY

15 WELL-DIFFERENTIATED. "

16

17 WHAT DOES "MODERATELY WELL-DIFFERENTIATED"

18 MEAN, PLEASE?

19 A. CANCERS ARE CLASSIFIED BY THE BEST
20 DIFFERENTIATED AREA AND ARE GRADED BY THE WORST. AND THE
21 MODERATELY WELL-DIFFERENTIATED REFERS TO HOW CLOSELY THE
22 CANCER CELLS RESEMBLE NORMAL CELLS.

23 IF YOU USE THE WORD "WELL-DIFFERENTIATED," THAT
24 WOULD MEAN THAT THE CANCER CELLS FAIRLY CLOSELY RESEMBLE THE
25 NORMAL CELLS FROM WHICH THEY ORIGINATED. IF YOU USE THE
26 ADJECTIVE POORLY DIFFERENTIATED, IT WOULD INDICATE THAT THE
27 CANCER CELLS DID NOT VERY CLOSELY RESEMBLE THE NORMAL CELLS
28 OF THE LUNG, BUT THERE WAS STILL EVIDENCE OF GLANDULAR

1 DIFFERENTIATIONS WHICH ALLOWED YOU TO MAKE THE DIAGNOSIS OF
2 ADENOCARCINOMA.

3 IN THIS CASE, THEY USE THE ADJECTIVE
4 "MODERATELY WELL," WHICH MEANS THAT IT'S KIND OF IN BETWEEN
5 MODERATELY DIFFERENTIATED, WHICH STILL LOOKS KIND OF LIKE A
6 NORMAL CANCER CELL, BUT THERE'S SOME CELLS THAT DON'T, AND
7 WELL-DIFFERENTIATED, WHICH MEANS THAT, YEAH, MOST OF THE
8 CANCER CELLS LOOK LIKE NORMAL CELLS FROM WHICH THEY AROSE.

9 Q. THANKS.

10 NEXT (READING):

11
12 "MAX NUMBER TUMOR
13 DIFFERENTIATION, 1.5 CENTIMETERS."

14
15 I GUESS WE'VE ALREADY TALKED ABOUT THAT. BUT
16 LET ME JUST ASK YOU. ARE THERE OTHER PLACES IN THE RECORDS
17 WHERE SOME PEOPLE THINK IT'S A LITTLE BIT LARGER?

18 A. RADIOGRAPHICALLY, THEY DO. IT REALLY DOESN'T
19 MAKE ANY DIFFERENCE. BECAUSE THE REASON THAT IS IMPORTANT IS
20 WHEN YOU DO WHAT'S CALLED THE ANATOMIC STAGING -- AND THAT IS
21 THE SINGLE MOST IMPORTANT THING IN DETERMINING THE PROGNOSIS
22 OF A PATIENT. AND THAT'S DONE IN WHAT'S CALLED A TN&M
23 SYSTEM "T" STANDS FOR TUMOR SIZE; "N" STANDS FOR LYMPH NODE
24 METASTASIS OR LACK THEREOF; AND "M" STANDS FOR DISTANT
25 METASTASES.

26 SO ANY TUMOR THAT'S LESS THAN 3 CENTIMETERS IN
27 DIAMETER OR GOLF BALL SIZE, THAT WOULD BE THE T-1 LESION. IN
28 MR. BOEKEN'S CASE, IF IT WAS 1.5 OR 2.3, IT WOULD STILL BE A

1 T-1.

2 SO IT REALLY DOESN'T MAKE A DIFFERENCE, FROM
3 ANATOMIC STAGING, WHICH WOULD DETERMINE HIS PROGNOSIS AND
4 ALSO WOULD BE DETERMINING HIS TREATMENT, IF YOU JUST WENT ON
5 THE INITIAL RADIOGRAPHIC APPEARANCE.

6 Q. THANK YOU.

7 NEXT (READING):

8

9 "RESECTION MARGINS ARE CLEAR."

10

11 HAVE YOU GOT AN IDEA -- MOST OF US HAVE AN IDEA
12 WHAT THAT MEANS, BUT WHAT DOES THAT MEAN MEDICALLY?

13 A. OKAY. THAT JUST MEANS, IS THAT THEY TOOK OUT
14 ENOUGH OF LUNG TISSUE THAT COMPLETELY SURROUNDED THE TUMOR
15 WHERE THERE WASN'T ANY CANCER.

16 AND THE REASON THAT'S IMPORTANT IS THAT IF YOU
17 HAD A TUMOR THAT WAS EXTENDING TO ONE OF THE MARGINS, YOU
18 WOULD HAVE STILL LEFT SOME CANCER IN THERE, WHICH IS NOT WHAT
19 YOU WANT TO DO. SO THE PATHOLOGIST SAID THAT THE RESECTION
20 MARGINS -- THAT WOULD MEAN ALL OF THE TISSUE WHICH THEY CUT
21 OUT -- THAT THERE WAS NO CANCER THAT EXTENDED TO THAT TISSUE.

22 Q. SO SORT OF LIKE A FIRE BREAK OR SOMETHING LIKE
23 THAT?

24 A. SURE.

25 Q. LAST (READING):

26

27 "SURROUNDING LUNG SHOWS MILD
28 CONGESTION WITH INTRAALVEOLAR HISTIOCYTE" --

1 A. YEAH. HISTIOCYTE.

2 Q. (READING:)

3

4

5

6

7

8

9

10

11

12

13

14

15

16

17

18

19

20

21

22

23

24

25

26

27

28

"SOME OF WHICH CONTAIN
HEMSIDERIN," PAREN, "(' HEART FAILURE
CELLS). ' "

NOW, DO YOU AGREE WITH ALL OF THAT PART?

A. NOT ALL OF IT. PART OF IT.

Q. WHAT PART DO YOU AGREE?

A. I AGREE THAT THERE WERE HISTIOCYTES PRESENT
ONLY. "HISTIO" MEANS TISSUE; "CYTES" MEANS CELLS. TISSUE
CELLS. AND THEY ARE SYNONYMOUS WITH A CELL CALLED
MACROPHAGES, WHICH COMES FROM THE BONE MARROW THAT GETS INTO
YOUR TISSUE AND DOES ALL KINDS OF NEAT THINGS, LIKE PROTECTS
YOU AGAINST INFECTIONS AND PROTECTS YOU AGAINST FOREIGN
MATERIAL.

SO I AGREE THAT THERE ARE HISTIOCYTE PRESENT.
I ALSO AGREE THAT THERE'S HEMSIDERIN IN THEM, BUT I DON'T
THINK THEY'RE HEART FAILURE CELLS, UNLESS THEY JUST USE THAT
AS A SIMPLE ADJECTIVE TO DESCRIBE CELLS THAT OCCUR IN PEOPLE
WITH CONGESTIVE HEART FAILURE THAT DO CONTAIN HEMSIDERIN.
WHAT THEY'RE REALLY DESCRIBING THERE ARE SMOKERS'
MACROPHAGES.

Q. WHY DON'T YOU THINK IT'S HEART FAILURE CELLS?

A. BECAUSE HE DIDN'T HAVE CONGESTIVE HEART
FAILURE. THERE WAS NO EVIDENCE THAT HE EVER HAD CONGESTIVE
HEART FAILURE.

1 Q. NO CONGESTIVE HEART FAILURE?

2 NO CONGESTIVE HEART FAILURE?

3 A. YEAH. AND THE OTHER THING IS, IF YOU LOOK AT
4 SIGNIFICANT CIGARETTE SMOKERS' MACROPHAGES AND YOU DO STAINS
5 FOR IRON, IF YOU DO IRON STAINS AND LOOK AT THE MACROPHAGES
6 THAT ARE PRESENT IN THE LUNGS OF CIGARETTE SMOKERS, YOU
7 BASICALLY CAN IDENTIFY HEMSIDERIN IN 100 PERCENT OF THEM

8 Q. SO LET'S TALK -- BECAUSE I DON'T SEE THE WORD
9 UP THERE -- MACROPHAGES.

10 WHAT DOES THAT MEAN?

11 A. "PHAGES" MEANS ENGULF; AND "MACRO" MEANS LARGE.
12 SO IT'S A LARGE ENGULFING CELL, AND IT IS SYNONYMOUS WITH THE
13 WORD HISTIOCYTE, WHICH IS THE TISSUE CELL.

14 Q. SO WHAT'S THE DIFFERENCE BETWEEN -- EXCUSE
15 ME -- "MACROPHAGES" IS THE SAME AS THIS WORD HERE,
16 "HISTIOCYTE"?

17 A. YES. SYNONYMOUS.

18 Q. OKAY. SYNONYMOUS.

19 SO WHAT'S THE DIFFERENCE BETWEEN -- LET ME
20 SWITCH THE WORDS. INSTEAD OF SAYING SMOKERS' MACROPHAGE, LET
21 ME USE THAT WORD HISTIOCYTE.

22 WHAT'S THE DIFFERENCE BETWEEN A REGULAR OLD
23 HISTIOCYTE AND ONE HAVING TO DO WITH SMOKING?

24 A. WELL, WHAT HAPPENS IN SMOKERS IS THAT ABOUT A
25 THIRD OF THE SMOKE THEY INHALE INTO THEIR LUNGS IS
26 PARTICULATE MATTER. AND THAT IF YOU WERE ABLE TO WEIGH --
27 AND YOU ARE ABLE TO DO THIS -- THE WEIGHT OF THE SMOKE GOING
28 IN VERSUS THE SMOKE COMING OUT, IS THAT IT'S ABOUT A THIRD

1 LESS HEAVY AS IT GOES OUT THAN IT WAS WHEN IT CAME IN.

2 AND THAT'S DUE TO THE PARTICULATE MATTER. AND
3 WHAT THE MACROPHAGES DO IS THEY SEE THAT PARTICULATE MATTER
4 AS A FOREIGN MATERIAL. AND MACROPHAGES DON'T LIKE FOREIGN
5 MATERIAL. SO THEY GO ALONG, LIKE PAC MAN, AND GRAB IT,
6 ENGULF IT, TAKE IT UP INTO HIS CYTOPLASM AND THAT GIVES THE
7 CYTOPLASM OF THE CELL, WHICH IS THE MATERIAL AROUND THE
8 NUCLEUS, THIS TANNISH-BROWN APPEARANCE, AND IN THERE WILL BE
9 SOME IRON, WHICH IS THE HEMSIDERIN.

10 Q. SO WHAT DO SMOKERS' MACROPHAGES LOOK LIKE
11 COMPARED TO OTHERS?

12 A. NORMAL MACROPHAGES WOULDN'T HAVE THIS
13 BROWNISH-TAN MATERIAL. THEY WOULD JUST USE THE USUAL DYES
14 THAT PATHOLOGISTS USE TO STAGE CELLS. THEY WOULD LOOK PINK
15 RATHER THAN BROWN.

16 Q. OKAY. SMOKERS' ARE BROWN AND TAN?

17 A. RIGHT.

18 Q. ALL RIGHT. PUT THIS DOWN TEMPORARILY.

19 ALL RIGHT. IT'S 2:30. DO YOU WANT TO SHOW US
20 A SLIDE, PLEASE.

21 A. SURE. I THINK THAT MACHINE THERE --
22 OKAY. GREAT.

23 THIS IS JUST A PART OF THE TUMOR THAT HAS BEEN
24 PHOTOGRAPHED, AS YOU LOOK AT IT, AT A FAIRLY HIGH
25 MAGNIFICATION. PROBABLY ABOUT 250 POWER.

26 AND WHAT IT SHOWS IS THE CANCER CELLS THAT ARE
27 FORMING VARIOUS PATTERNS. AND WITHOUT GETTING TOO DETAILED,
28 THERE'S SOME AREAS WHERE THE TUMOR HAS A PAPILLARY PATTERN

1 THERE WHERE YOU HAVE THESE OUTPOUCHINGS OF THE CELLS INTO THE
2 AIR SPACES.

3 AND HERE'S JUST A HIGHER MAGNIFICATION OF THOSE
4 WHERE YOU CAN SEE, AGAIN, A LITTLE PAPILLARY OUTPOUCHING INTO
5 AIR SPACE. ALSO, YOU CAN SEE THE INDIVIDUAL CANCER CELLS.

6 Q. LET ME STOP YOU FOR A SECOND.

7 YOU CAN SEE A PAPILLARY OUTPOUCHING INTO
8 SOMETHING, BUT I CAN'T SEE IT.

9 A. YOU CAN'T. OKAY. CAN I --

10 THE COURT: PLEASE, SIR.

11 THE WITNESS: THIS IS A RELATIVELY HIGH-POWERED
12 MAGNIFICATION OF THE TUMOR, JUST A SMALL AREA OF IT.

13 AND FIRST, I'LL JUST -- SO THESE ARE THE
14 INDIVIDUAL CANCER CELLS. AND CELLS ARE MADE UP OF NUCLEUS
15 THAT CONTAINS DNA, WHICH WOULD BE RIGHT HERE.

16 THEN THE PINK AROUND HERE, THAT'S THE
17 CYTOPLASM EACH ONE OF THESE CANCER CELLS THAT WAS INITIALLY
18 DERIVED FROM A SINGLE CELL. AND IT'S FORMING HERE KIND OF A
19 GLANULAR STRUCTURE.

20 AND IN HERE, THERE'S SOME KIND OF A PAPILLARY
21 PROJECTION OF THESE CELLS IN HERE, INTO THIS SPACE HERE,
22 WHICH COULD WELL BE AN AIR SPACE.

23 AND THEN YOU HAVE SOME INCREASE IN WHAT'S
24 CALLED THE STROMAL TISSUE IN BETWEEN. THAT'S JUST ONE TYPE
25 OF AN ADENOCARCINOMA. THAT IS KIND OF SHOWING THIS PAPILLARY
26 PATTERN HERE.

27 THESE ARE AIR SPACES, WHICH IS KIND OF HARD TO
28 TELL ON THIS PHOTOGRAPH.

1 THIS WOULD ALSO BE CONSISTENT WITH A
2 BRONCHIOLOALVEOLAR CELL GROWTH PATTERN.

3 Q. BY MR. PIUZE: LET'S STAY WITH THAT FOR A
4 SECOND. BECAUSE WE WANT TO TALK ABOUT THAT.

5 BRONCHIO -- WHAT'S -- SAY THE TERM AGAIN?

6 A. IT'S A BRONCHIOALVEOLAR,
7 B-R-O-N-C-H-I-O-L-O-A-L-V-E-O-L-A-R.

8 VERY SIMPLE. IT REALLY IS. IT'S -- IF YOU
9 THINK ABOUT YOUR LUNGS AND THE WAY YOU BREATHE, THE AIR COMES
10 INTO YOUR MOUTH, GOES DOWN THIS BIG TUBE CALLED A TRACHEA,
11 AND THEN IT GETS INTO THESE SMALLER BRANCHES. AND
12 EVENTUALLY, THESE BRANCHES GET SMALLER AND SMALLER AND
13 SMALLER, UNTIL THEY GET OUT TO AN AREA WHERE THE GAS
14 EXCHANGE OCCURS.

15 AND IF YOU REMEMBER FROM YOUR HIGH SCHOOL
16 BIOLOGY, IS THAT THE MAIN FUNCTION OF THE LUNGS IS TO
17 OXYGENATE THE BLOOD. AND HOW IT DOES THIS IS THAT THE AIR
18 COMES IN, WHICH IS 20 PERCENT OXYGEN, AND IS CARRIED THROUGH
19 THESE AIR TUBES, AND IT GETS WAY OUT TO THE OUTER PART OF THE
20 LUNG WHERE YOU HAVE AIR SACS. AND THESE AIR SACS ARE
21 SCIENTIFICALLY REFERRED TO AS ALVEOLI.

22 AND THE LITTLE TUBES THAT ARE RIGHT BEFORE THE
23 ALVEOLI ARE CALLED ALVEOLAR DUCTS. AND THEN THE STRUCTURES
24 RIGHT BEFORE THEM, WHICH ARE VERY, VERY TINY, ARE CALLED
25 BRONCHIALS. SO A BRONCHIOALVEOLAR CELL CARCINOMA MEANS A
26 CANCER OF CELLS DERIVED FROM THE BRONCHIALS AND/OR THE
27 ALVEOLI, AND THAT'S ALL IT MEANS.

28 AND THERE ARE TWO MAIN CELLS THAT THESE CANCERS

1 ARE DERIVED FROM ONE IS CALLED A CLARA CELL, CAPITAL,
2 C-L-A-R-A, WHICH IS NAMED AFTER A PERSON. AND THE OTHER IS
3 CALLED A TYPE II PNEUMCYTE, P-N-E-U-M-O-C-Y-T-E. AND
4 "PNEUM," AGAIN, MEANS AIR; "CYTE" IS A CELL, AN AIR CELL.

5 SO CANCERS THAT OCCUR IN THIS PART OF THE LUNG
6 THAT ARE CALLED BRONCHIOLOALVEOLAR CELL CARCINOMAS ARE
7 CANCERS THAT ARE DERIVED FROM THOSE CELLS THAT FREQUENTLY
8 GROW ALONG PRE EXISTING ALVEOLAR STRUCTURES, WHICH WOULD BE
9 THESE RIGHT HERE.

10 Q. YOU' RE RIGHT. IT WAS EASY.

11 A. IT REALLY IS.

12 Q. NOW, YOU SAID THERE WERE CERTAIN CELLS THERE
13 THAT COULD BE A I OR A II, RIGHT?

14 A. IT COULD BE A TYPE II PNEUMCYTE OR A CLARA
15 CELL.

16 Q. OKAY. BEFORE WE GO TO THAT.

17 WHEN YOU SAID THESE CELLS CAN ALSO BE
18 BRONCHIOLOALVEOLAR, I THOUGHT YOU WERE SAYING IT COULD BE
19 SOMETHING ELSE BESIDES THAT, TOO.

20 A. WELL, THE THING IS, IS THAT IT'S A LITTLE
21 CONFUSING. BECAUSE MOST OF THE NORMAL LUNG CANCERS ARE
22 DERIVED FROM ONE OF THESE TWO CELLS, BUT THEY CAN FORM ALL
23 DIFFERENT PATTERNS. THEY CAN FORM A PAPILLARY PATTERN. THEY
24 CAN FORM A BRONCHIOLOALVEOLAR PATTERN. THEY CAN FORM AN
25 ACINAR PATTERN, OR A SOLID PATTERN. AND THEN THEY CAN ALSO
26 UNDERGO SOME REAL CHANGES, WHICH I' LL SHOW A LITTLE BIT
27 LATER.

28 AND HERE' S JUST A REAL HIGH POWER. PROBABLY

1 TAKEN UNDER WHAT'S CALLED OIL IMMERSION, PROBABLY WITH 1200
2 MAGNIFICATION. THERE, YOU CAN SEE THE INDIVIDUAL CANCER
3 CELLS, AND YOU SEE THE BLuish PART OF IT. THAT'S THE
4 NUCLEUS. AND THEN YOU SEE THE RED DOTS IN THE CENTER.
5 THAT'S THE NUCLEUS. AND THE NUCLEUS HAS THE DNA AND THE
6 NUCLEOLUS HAS THE RNA. AND THE RNA TRANSCRIBES THE DNA.
7 THAT MEANS, IT COPIES THE DNA AND THEN TAKES IT OUT INTO THE
8 CYTOPLASM AND TELLS IT WHAT TO DO.

9 AND TYPICALLY, THOSE CELLS, IN NORMAL
10 SITUATIONS, THEY PRODUCE WHAT'S CALLED SURFACTANT, WHICH IS A
11 MATERIAL THAT REDUCES THE SURFACE TENSION IN YOUR AIR SACS SO
12 YOU CAN HAVE -- WHICH FACILITATES OXYGENATION OF THE BLOOD.

13 HERE'S AN AREA HERE WHERE THE TUMOR HAD MORE OF
14 AN ACINAR PATTERN. AND BY THAT, I MEAN, INSTEAD OF BEING
15 ALONG -- TYPICAL ALVEOLAR WALL STRUCTURES, LIKE YOU COULD SEE
16 RIGHT HERE, IT'S STARTING TO FORM THESE CIRCULAR STRUCTURES,
17 WHICH LOOK MORE LIKE ORDINARY GLANDS. AND THAT'S REFERRED TO
18 AS ACINAR, A-C-I-N-A-R. SO THERE'S AREAS WHERE THE TUMOR
19 LOOKS LIKE THAT.

20 AND THEN THE INTERESTING THING -- OR I SHOULD
21 SAY, INTERESTING, AT LEAST TO A PATHOLOGIST -- IS THAT IN THE
22 LYMPH NODES AROUND THE RIGHT UPPER LOBE THAT WAS REMOVED,
23 WHICH ARE CALLED HILAR, H-I-L-A-R, LYMPH NODES AND THE LYMPH
24 NODES THAT WERE AROUND THE TRACHEA, WHICH ARE CALLED
25 PARATRACHEAL INFLUENCE, THEY CONTAINED METASTATIC TUMOR.

26 AND THIS IS AN EXAMPLE OF A LYMPH NODE OR A
27 PART OF A LYMPH NODE, AND THE "C" OUT THERE ON THE LEFT IS
28 THE CAPSULE OF THE LYMPH NODE, AND THEN THE BLuish CELLS THAT

1 YOU CAN SEE RIGHT HERE, ALL OF THESE CELLS, THOSE ARE NORMAL
2 LYMPHOCYTES IN THE LYMPH NODE.

3 AND THEN YOU CAN SEE, THERE'S A DIFFERENCE
4 BETWEEN HERE AND HERE. AND WHAT THIS -- THIS IS
5 METASTATIC CANCER. THAT IS CANCER THAT HAS SPREAD
6 TO THE LYMPH NODE FROM THE PRIMARY LUNG CANCER.

7 BUT WHAT'S INTERESTING ABOUT IT -- WHOOPS.
8 I GUESS WE DIDN'T HAVE THAT AT HIGHER POWER VIEW I'M SORRY.

9 THOSE CELLS LOOK TOTALLY DIFFERENT THAN THE
10 PRIMARY TUMOR. AND THAT'S NOT SURPRISING, BECAUSE THE WAY
11 CANCERS SPREAD IS THAT THEY UNDERGO THESE GENETIC MUTATIONS,
12 AGAIN, TO PRODUCE THINGS THAT ALLOW THEM TO METASTASIZE, AND
13 THOSE CELLS LOOK LIKE WHAT ARE CALLED THE SIGNET RING,
14 S-I-G-N-E-T, RING CELLS THAT HAD MUCOUS IN THEM, WHICH WAS
15 DIFFERENT THAN THE CELLS OF THE PRIMARY TUMOR.

16 AND THEN THERE'S A COUPLE OF OTHER THINGS THAT
17 WE'RE SHOWING. IS THAT THIS IS A LYMPHATIC CHANNEL RIGHT
18 HERE. AND A LYMPHATIC CHANNEL IS A CHANNEL THAT'S LINED BY
19 THESE CELLS HERE, WHICH ARE CALLED ENDOTHELIAL,
20 E-N-D-O-T-H-E-L-I-A-L, CELLS, AND RIGHT INSIDE OF THIS
21 LYMPHATIC CHANNEL IS CANCER.

22 SO IT'S GAINED ACCESS TO THE LYMPHATIC
23 CHANNELS. HERE'S THE MUCOUS PRODUCTION CLEAR, RIGHT HERE,
24 FOR EXAMPLE, AND THAT'S HOW IT SPREADS.

25 Q. ARE THERE MORE SLIDES?

26 A. THERE'S JUST ONE MORE.

27 AND THIS SHOWS A COUPLE THINGS. IT SHOWS AN
28 AREA WHERE THERE'S NOT CANCER. IT'S NOT NORMAL, BUT IT

1 SHOWS -- THESE ARE THE SMOKERS' MACROPHAGES HERE, HERE, HERE,
2 HERE, HERE, HERE.

3 THE ALVEOLI, WHICH ARE THESE STRUCTURES HERE,
4 ARE LINED BY THICKENED WALLS THAT HAVE AN INCREASED AMOUNT OF
5 CONNECTIVE TISSUE, AND THERE'S DILATION IN THESE ALVEOLI.

6 AND MYSELF, I DIDN'T SEE ANY DESTRUCTION, SO
7 I'M NOT SURE I CAN DIAGNOSE EMPHYSEMA, BUT THERE IS A DILATED
8 AIR SPACE HERE, WHICH IS ONE OF THE FEATURES OF EMPHYSEMA.

9 Q. SO LET'S JUST TAKE THAT LAST PART. IT'S
10 GOT -- THAT PARTICULAR SLIDE HAS A FEATURE OF EMPHYSEMA, BUT
11 NOT ENOUGH FOR YOU TO DIAGNOSIS IT?

12 A. I COULDN'T SEE TISSUE DESTRUCTION, SO I
13 WOULDN'T DIAGNOSIS EMPHYSEMA UNLESS YOU COULD SEE TRUE TISSUE
14 DESTRUCTION.

15 I THINK THAT'S THE LAST ONE.

16 Q. OKAY. JUST STAY THERE ONE SECOND, IF YOU
17 WOULD. I MEAN, YOU CAN SIT DOWN. BUT ON -- I MEAN, ON THIS
18 SLIDE.

19 IF THOSE MACROPHAGES WEREN'T SMOKERS'
20 MACROPHAGES, WOULD THEY BE LESS DARK THAN WE'RE SEEING RIGHT
21 NOW?

22 A. THEY WOULD BE LESS DARK, AND YOU WOULDN'T SEE
23 ANYTHING LESS TO THAT MANY.

24 Q. WE'VE DISCUSSED THE COLORATION PART ALREADY.
25 WHY WOULDN'T WE SEE ANYTHING CLOSE TO THAT MANY
26 IF IT WASN'T SMOKERS' MACROPHAGES?

27 A. BECAUSE IF YOU WEREN'T INTRODUCING FOREIGN
28 MATERIAL INTO YOUR LUNG, THERE WOULDN'T BE ANY NEED FOR THOSE

1 CELLS TO DIVIDE AND INCREASE IN NUMBER TO TAKE CARE OF THE
2 FOREIGN MATERIAL.

3 Q. IF THERE WAS NOTHING FOREIGN IN THE LUNG, LIKE
4 THE PARTICULATE FROM TOBACCO SMOKE, APPRECIATING THE FACT
5 THAT THEY' D BE A DIFFERENT COLOR, WOULD WE SEE ANY OR MAYBE
6 ONE?

7 A. YOU COULD SEE A FEW, BUT YOU WOULDN' T SEE --
8 YOU' D SEE HARDLY ANY. YOU' D SEE HARDLY ANY. MOST SPACES
9 WOULD NOT CONTAIN ANYTHING IN THEM

10 THE OTHER THING YOU WOULDN' T SEE IS THOSE. THE
11 WALLS OF THOSE AIR SACS ARE ALSO ABOUT ANYWHERE FROM TWO TO
12 ABOUT TEN TIMES THICKER THAN NORMAL.

13 Q. WHAT' S THE SIGNIFICANCE OF THE FACT THAT THE
14 WALLS ARE MUCH THICKER THAN NORMAL?

15 A. THAT' S ANOTHER TYPE OF CHANGE THAT' S FREQUENTLY
16 SEEN IN CIGARETTE SMOKERS.

17 Q. GOT YOU. OKAY. SO THANK YOU.

18 JUST AS AN OVERVIEW HERE, BEFORE WE TURN OFF
19 THAT PROJECTOR.

20 WHEN YOU WENT THROUGH -- OR THE COMPUTER.

21 WHEN YOU WENT THROUGH THE SLIDES, YOU TOLD US
22 YOU SAW SOME ACINAR-TYPE CELLS?

23 A. I SAW SOME AREAS OF ACINAR DIFFERENTIATION.

24 Q. DIFFERENTIATION. SORRY.
25 PAPILLARY DIFFERENTIATION?

26 A. YES.

27 Q. AND BRONCHIOLOALVEOLAR DIFFERENTIATION?

28 A. YES.

1 Q. ALL OF THEM?

2 A. YES.

3 Q. DOES THE FACT THAT YOU SAW ANY ONE SUBTYPE MEAN
4 IT ISN'T ADENOCARCINOMA?

5 A. NO.

6 Q. DOES THE FACT THAT YOU SAW ANY ONE SUBTYPE MEAN
7 THAT IT'S AN ADENOCARCINOMA DOMINATED BY THAT PARTICULAR
8 SUBTYPE?

9 A. NO.

10 Q. IS THERE A SUBTYPE WHICH DOMINATES HERE?

11 A. IF YOU HAD TO PICK ONE, IT WOULD BE PAPILLARY.
12 BUT THERE'S -- ALL THREE SUBTYPES ARE ALL THREE AREAS OF
13 DIFFERENTIATION.

14 Q. SO DR. GELLER OVER AT CEDARS PICKED PAPILLARY.
15 IF I TWISTED YOUR ARM AND SAY YOU'VE GOT TO
16 PICK ONE, IS THAT THE ONE YOU'D PICK?

17 A. I WOULDN'T HAVE SIGNED IT OUT LIKE THAT. I
18 WOULD HAVE SIGNED IT OUT AN ADENOCARCINOMA SHOWING
19 VARIABLE-TYPE DIFFERENTIATION. FROM A PRACTICAL POINT OF
20 VIEW, LIKE I SAID, IT DOES NOT MAKE ANY DIFFERENCE.

21 Q. THIS IS THE END OF THIS SEGMENT OF MY
22 QUESTIONING.

23 NOW, IF WE GO TO THE WORLD HEALTH ORGANIZATION,
24 "HISTOLOGICAL TYPING OF LUNG AND PLEURAL TUMORS," WOULD IT
25 CALL IT THE SAME THING YOU JUST CALLED IT?

26 A. YES. I THINK IF YOU LOOK -- I THINK IT'S ON
27 PAGE 13 IN THERE, IF YOU LOOK UNDER ADENOCARCINOMA, THEY MAKE
28 A DEFINITE STATEMENT, I THINK, IN THE VERY FIRST PARAGRAPH

1 THAT MOST ADENOCARCINOMAS SHOW MIXED PATTERNS. THAT'S HOW IT
2 STARTS OUT. MAYBE IT'S PAGE 12.

3 Q. WHICH PAGE?

4 A. IT'S PAGE 12.

5 Q. JUST READ IT, WOULD YOU.

6 A. IT SAYS -- THIS IS THE FIRST PARAGRAPH UNDER
7 THE HEADING "ADENOCARCINOMA." IT SAYS (READING):

8

9

"SUBCLASSIFICATION OF
10 ADENOCARCINOMA IS FRAUGHT WITH DIFFICULTIES,
11 SINCE THESE TUMORS ARE HIGHLY HETEROGENOUS
12 HISTOLOGICALLY. WITH ONLY A MAJORITY OF
13 CASES SHOWING A PURE HISTOLOGICAL PATTERN,
14 THE CURRENT CLASSIFICATION RECOGNIZES THAT
15 MOST ADENOCARCINOMAS WILL BE OF THE MIXED
16 SUBTYPE. "

17

18 Q. SO YOU SAID HIGHLY HETEROGENOUS
19 HISTOLOGICALLY?

20 A. RIGHT.

21 Q. WHAT IN THE WORLD IS THAT?

22 A. "HISTOLOGICALLY" MEANS HOW THE CANCER LOOKS IF
23 YOU WERE LOOKING AT IT THROUGH A MICROSCOPE, LIKE THOSE
24 SLIDES ARE. THAT REFERS TO HISTOLOGY. "HISTOLOGY," MEANING
25 TISSUE AND "HETEROGENOUS" MEANS IT'S GOT VARIABLE PATTERNS,
26 OR IT SHOWS A DIFFERENCE BETWEEN ONE AREA AND ANOTHER AREA
27 RATHER THAN BEING "HOMOGENEOUS" WOULD BE THE SAME IN ALL
28 AREAS.

1 Q. SO HIGHLY HISTOLOGY --
2 SAY IT AGAIN?
3 A. HISTOLOGICAL.
4 Q. HISTOLOGICALLY --
5 A. HETEROGENOUS.
6 Q. -- HETEROGENOUS. HIGHLY HETEROGENOUS?
7 A. RIGHT.
8 Q. ALL MIXED UP?
9 A. RIGHT.
10 Q. NOT ME; THAT'S WHAT IT MEANS?
11 A. THAT'S WHAT IT MEANS. IT MEANS ALL DIFFERENT
12 PATTERNS.
13 MR. PIUZE: OKAY, YOUR HONOR. I'M SORT OF KEEPING
14 SCORE OF THE TIME.
15 THE COURT: THAT WOULD BE JUST FINE. THANK YOU VERY
16 MUCH, SIR.
17 ALL RIGHT. LADIES AND GENTLEMEN, BE BACK AT
18 3 O' CLOCK.
19 DON'T DISCUSS THE CASE WITH ANYBODY.
20
21 (RECESS.)
22 /
23 /
24 /
25 /
26 /
27 /
28 /