CONFIDENTIALITY:
Please be assured that all information you provide will be kept confidential and will not be disclosed to anyone but the researchers conducting this study, except as otherwise required by law. Any published results from this survey will be reported in statistical summaries only and will never include a participant's name. Your participation in this study is completely voluntary and failure to answer any particular question or the information collection as a whole will not affect your future contacts with the University of Minnesota, the American Registry of Radiologic Technologists, or the National Institutes of Health.
INSTRUCTIONS:
You may use a blue or black pen when completing this form. Please return completed questionnaire in the postage-paid envelope provided.

Please answer each question to the best of your recollection. Even if you are unable to recall answers exactly, your best estimates will help us better understand exposure levels during different time periods.

MARKING INSTRUCTIONS
RIGHT  WRONG
☑️  ✗  ✗  ✗
Please use blue or black pen.

PARTICIPANT INFORMATION

1. What is today's date?
   M  M   D  D   Y  Y  Y  Y

2. Are you male or female?
   ☐  Male
   ☐  Female

3. What is your date of birth?
   M  M   D  D   Y  Y  Y  Y

MEDICAL HISTORY

The first part of this questionnaire includes questions to update the health information you provided in the last survey.

4. Did a doctor ever tell you that you had any of the following types of CANCER or malignant tumors? For each type of cancer that you mark YES, please provide the year it was first diagnosed.

<table>
<thead>
<tr>
<th>Type of Cancer</th>
<th>Yes</th>
<th>Year 1st Diagnosed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bladder</td>
<td>☐</td>
<td>Y  Y  Y  Y</td>
</tr>
<tr>
<td>Bone</td>
<td>☐</td>
<td>Y  Y  Y  Y</td>
</tr>
<tr>
<td>Cervix (invasive, not in situ)</td>
<td>☐</td>
<td>Y  Y  Y  Y</td>
</tr>
<tr>
<td>Colon</td>
<td>☐</td>
<td>Y  Y  Y  Y</td>
</tr>
<tr>
<td>Connective or other soft tissue</td>
<td>☐</td>
<td>Y  Y  Y  Y</td>
</tr>
<tr>
<td>Esophagus</td>
<td>☐</td>
<td>Y  Y  Y  Y</td>
</tr>
<tr>
<td>Hodgkin's Disease</td>
<td>☐</td>
<td>Y  Y  Y  Y</td>
</tr>
<tr>
<td>Kidney</td>
<td>☐</td>
<td>Y  Y  Y  Y</td>
</tr>
<tr>
<td>Larynx</td>
<td>☐</td>
<td>Y  Y  Y  Y</td>
</tr>
<tr>
<td>Leukemia, Acute Lymphocytic</td>
<td>☐</td>
<td>Y  Y  Y  Y</td>
</tr>
<tr>
<td>Leukemia, Chronic Lymphocytic</td>
<td>☐</td>
<td>Y  Y  Y  Y</td>
</tr>
<tr>
<td>Leukemia, Acute Myeloid</td>
<td>☐</td>
<td>Y  Y  Y  Y</td>
</tr>
<tr>
<td>Leukemia, Chronic Myeloid</td>
<td>☐</td>
<td>Y  Y  Y  Y</td>
</tr>
<tr>
<td>Leukemia, other or type unknown</td>
<td>☐</td>
<td>Y  Y  Y  Y</td>
</tr>
<tr>
<td>Liver</td>
<td>☐</td>
<td>Y  Y  Y  Y</td>
</tr>
<tr>
<td>Lung, trachea or bronchus</td>
<td>☐</td>
<td>Y  Y  Y  Y</td>
</tr>
<tr>
<td>Lymphoma, Non-Hodgkin's</td>
<td>☐</td>
<td>Y  Y  Y  Y</td>
</tr>
<tr>
<td>Lymphoma, other or type unknown</td>
<td>☐</td>
<td>Y  Y  Y  Y</td>
</tr>
<tr>
<td>Melanoma of the Skin</td>
<td>☐</td>
<td>Y  Y  Y  Y</td>
</tr>
<tr>
<td>Melanoma of the Eye</td>
<td>☐</td>
<td>Y  Y  Y  Y</td>
</tr>
</tbody>
</table>
### Type of Cancer

<table>
<thead>
<tr>
<th>Type of Cancer</th>
<th>Yes</th>
<th>Year 1st Diagnosed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Melanoma, Other</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Multiple myeloma</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ovary</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pancreas</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pharynx</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Prostate</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rectum</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Salivary gland</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Skin cancer other than melanoma</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

If YES:

#### What type?

<table>
<thead>
<tr>
<th>Type</th>
<th>Year 1st Diagnosed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Basal cell</td>
<td></td>
</tr>
<tr>
<td>Squamous cell</td>
<td></td>
</tr>
<tr>
<td>Other or type unknown</td>
<td></td>
</tr>
</tbody>
</table>

#### Stomach

<table>
<thead>
<tr>
<th>Year 1st Diagnosed</th>
</tr>
</thead>
</table>

#### Testis

<table>
<thead>
<tr>
<th>Year 1st Diagnosed</th>
</tr>
</thead>
</table>

#### Thyroid

<table>
<thead>
<tr>
<th>Year 1st Diagnosed</th>
</tr>
</thead>
</table>

### Any other type of cancer (including unknown types)

If YES:

<table>
<thead>
<tr>
<th>Year 1st Diagnosed</th>
</tr>
</thead>
</table>

### 4a. Mark here if you were never diagnosed with any cancer

Yes | No | If YES: Type: |

### 5. Did a doctor ever tell you that you had any of the following BENIGN tumors or other medical conditions? For each condition you mark YES, please provide the year it was first diagnosed.

#### Medical Condition

<table>
<thead>
<tr>
<th>Year 1st Diagnosed</th>
</tr>
</thead>
</table>

#### Benign tumor of the brain or nervous system

If YES: what type of tumor?

- Meningioma?
- Schwannoma?
- Acoustic neuroma?

#### Thyroid conditions:

- Benign thyroid tumor (adenoma)
- Thyroid nodule
- Goiter (enlarged thyroid)
- Thyroiditis (Hashimoto's Disease)
- Hyperthyroidism (overactive thyroid)
- Hypothyroidism (underactive thyroid)
- Any other thyroid conditions
- Pituitary tumor
- Hyperparathyroidism

#### [WOMEN ONLY]

- Uterine fibroids (myoma)?
- Fibrocystic or other benign breast disease such as fibroadenoma or hyperplasia?

If YES, was it confirmed by breast biopsy or aspiration?

Yes | No | If YES: |

### 5a. Mark here if you were never diagnosed with any of the above benign tumors or medical conditions
6. Did a doctor ever tell you that you had any of the following cardiovascular conditions? For each condition you mark YES, please provide the year it was first diagnosed.

<table>
<thead>
<tr>
<th>Medical Condition</th>
<th>Yes</th>
<th>Year 1st Diagnosed</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>High blood pressure</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>If YES, have you ever taken medicine for high blood pressure?</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td><strong>Stroke (cerebrovascular accident)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>TIA (transient ischemic attack)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Heart attack, myocardial infarction (MI)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Angina pectoris</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>If YES, was this confirmed by angiography?</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td><strong>6a. Mark here if you were never diagnosed with any of the above cardiovascular conditions</strong></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

7. Did a doctor ever tell you that you had any of the following eye conditions? For each condition you mark YES, please provide the year it was first diagnosed.

<table>
<thead>
<tr>
<th>Medical Condition</th>
<th>Yes</th>
<th>Year 1st Diagnosed</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Macular degeneration</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Cataracts</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>If YES, did you have any cataracts removed?</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td><strong>Year 1st Removed</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Glaucoma</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>7a. Mark here if you were never diagnosed with any of the above eye conditions</strong></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

8. Did a doctor ever tell you that you had any of the following medical conditions? For each condition you mark YES, please provide the year it was first diagnosed.

<table>
<thead>
<tr>
<th>Medical Condition</th>
<th>Yes</th>
<th>Year 1st Diagnosed</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Cirrhosis of the liver</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Diabetes</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>If YES, do you currently take insulin for diabetes?</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td><strong>Osteoporosis</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Multiple sclerosis</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Parkinson’s Disease</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Attention-deficit disorder</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>with or without hyperactivity.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>If YES, at what age, did you first take Ritalin or other stimulant medication for this condition?</td>
<td>Age</td>
<td>Never Took</td>
</tr>
<tr>
<td><strong>Systemic Lupus Erythematosus</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Osteoarthritis</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Rheumatoid arthritis</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Scleroderma</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>8a. Mark here if you were never diagnosed with any of the above other conditions</strong></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

9. (Without shoes or clothes), about how much did you weigh when you were . . .

- **18-22 years of age** POUNDS
- **in your 30s** POUNDS
- **in your 40s** POUNDS
- **in your 50s** POUNDS
- **currently** POUNDS
10. If you gained weight when you were between 40 and 59 years old, where on your body did you mainly tend to add the weight at this time? (SELECT THE ONE BEST ANSWER.)
   - Did not gain weight between 40 and 59 years old.
   - Around the chest or shoulders
   - Around the waist or stomach
   - Around the hips or thighs
   - Equally all over

   [SMOKING HISTORY]

11. Do you smoke cigarettes currently?
   - Yes ➔ [GO TO 12]
   - No

11a. If you smoked in the past, how old were you when you stopped smoking? ... ❏ ❏ YEARS

12. How many cigarettes per day do you or did you usually smoke? (SELECT THE ONE BEST ANSWER)
   - 1-10
   - 11-20
   - 21-30
   - 31-40
   - 41-60
   - 61 or more

   [PHYSICAL ACTIVITY]

The following questions are about recreational or leisure time physical activities during four periods of your life. When answering these questions, do not include physical activity or exercise that is part of a job.

13. On average, about how many hours per week did you participate in strenuous physical activities during each of the four ages listed below? (Leave blank if age group is not applicable to you.)
   - Strenuous activity means something that increases your heart rate and/or causes you to perspire (for example, running, jogging, cross-country skiing, vigorous swimming or bicycling).
   - Between ages 18-22 ............ ❏ ❏ HRs/WK
   - In your 50s ...................... ❏ ❏ HRs/WK
   - In your 30s ....................... ❏ ❏ HRs/WK
   - Currently ...................... ❏ ❏ HRs/WK

14. On average, about how many hours per week did you participate in moderate physical activities during each of the four ages listed below? (Leave blank if age group is not applicable to you.)
   - Moderate activity means something that requires effort but is not exhausting (for example, walking for exercise, easy swimming, bicycling or golfing).
   - Between ages 18-22 ............ ❏ ❏ HRs/WK
   - In your 50s ...................... ❏ ❏ HRs/WK
   - In your 30s ....................... ❏ ❏ HRs/WK
   - Currently ...................... ❏ ❏ HRs/WK

   [GO TO 12]
The next section is about your work experience as a radiologic technologist.

For purposes of this survey, the term "RADIOLOGIC TECHNOLOGIST" will refer to any job in which you performed or assisted with diagnostic or therapeutic radiation procedures in a health care setting. This information will improve our ability to properly estimate radiation dose over time. Because practices and standards in the field changed over time, we are asking about four time periods.

### Time Periods

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>15.</strong> How many years did you work as a radiologic technologist during each time period?</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>16.</strong> For your longest job in each time period, which of the following best describes the kind of facility you worked in?</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hospital</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Physician(s) office or clinic</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dentist's office</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other facility</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>17.</strong> About how many hours per week did you usually work as a radiologic technologist at this longest job during each time period?</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>18.</strong> Did you ever wear a dosimetry badge while working at this longest job in each time period?</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>Yes</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Go to question 16 for next time period.</td>
<td>Go to question 16 for next time period.</td>
<td>Go to question 16 for next time period.</td>
<td>Go to question 20, page 8.</td>
<td></td>
</tr>
<tr>
<td><strong>19.</strong> When you wore an apron at this longest job in each time period, did you usually wear the dosimetry badge on the inside or outside of the apron?</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>inside</td>
<td>outside</td>
<td>never wore apron</td>
<td>inside</td>
<td>outside</td>
</tr>
</tbody>
</table>
20. Did you work as a radiologic technologist between 1950 through 1959? □ Yes  □ No → [GO TO 44 ON PAGE 10]

The following questions are about some types of radiologic procedures you may have worked or assisted with on the job you held the longest between 1950 and 1959. You don’t need to know exact answers. Just choose the answers that best fit your experience.

**Routine Diagnostic X-RAY**
(such as chest x-rays, portable x-rays, mammograms, etc.)

21. How many ROUTINE DIAGNOSTIC X-RAY procedures did you perform or assist with during a typical week at this longest job in the 1950s?

□ zero [GO TO 27] □ 25-49 per week
□ less than 10 per week □ 50-99 per week
□ 10-24 per week □ 100 or more per week

22. When performing ROUTINE DIAGNOSTIC X-RAY procedures, what percentage of the time were you inside the room?

[Inside the room includes standing behind a shield or partial wall open to the patient. Outside means separated from the patient by the room walls and a door.]

□ zero [GO TO 27] □ 25-74%
□ less than 25% □ 75% or more

23. When performing ROUTINE DIAGNOSTIC X-RAY procedures, what percentage of the time did you wear a protective apron?

□ zero □ 25-74%
□ less than 25% □ 75% or more

24. When performing ROUTINE DIAGNOSTIC X-RAY procedures, what percentage of the time did you stand behind a screen, shield or other protective enclosure?

□ zero [GO TO 26] □ 25-74%
□ less than 25% □ 75% or more

25. How high did the screen, shield or other protective enclosure extend?

□ above the head □ up to the shoulders
□ up to the waist

26. When performing ROUTINE DIAGNOSTIC X-RAY procedures, what percentage of patients being x-rayed did you hold during the procedure?

□ zero □ 10-24%
□ less than 10% □ 25% or more

**Fluoroscopy**
(such as angiograms, barium swallows, etc.)

27. How many FLUOROSCOPY procedures did you perform or assist with during a typical week at this longest job in the 1950s?

□ zero [GO TO 33] □ 25-49 per week
□ less than 10 per week □ 50-99 per week
□ 10-24 per week □ 100 or more per week

28. When performing FLUOROSCOPY procedures, what percentage of the time were you inside the room?

□ zero [GO TO 32] □ 25-74%
□ less than 25% □ 75% or more

29. When performing FLUOROSCOPY procedures, what percentage of the time did you wear a protective apron?

□ zero □ 25-74%
□ less than 25% □ 75% or more

30. When performing FLUOROSCOPY procedures, what percentage of the time did you stand behind a screen, shield or other protective enclosure?

□ zero [GO TO 32] □ 25-74%
□ less than 25% □ 75% or more

31. How high did the screen, shield or other protective enclosure extend?

□ above the head □ up to the shoulders
□ up to the waist

32. Excluding set-up time, what percentage of the FLUOROSCOPY procedures that you performed or assisted with were more than 15 minutes long?

□ zero □ 25-49%
□ less than 25% □ 50% or more
33. How many DIAGNOSTIC RADIOISOTOPE procedures (injections or oral procedures) did you perform or assist with during a typical week at this longest job in the 1950s?

- zero [GO TO 38]
- less than 10 per week
- 10-24 per week
- 25-49 per week
- 50-99 per week
- 100 or more per week

34. When working with DIAGNOSTIC RADIOISOTOPE procedures, how many times did you prepare the radiopharmaceutical kit and/or elute generators (i.e., separate and measure a concentrated amount of isotope from its source for use in a radiopharmaceutical kit) during a typical week at this longest job?

- zero
- 1-9 per week
- 10-24 per week
- 25-49 per week
- 50+ per week

35. When performing injections, or administrations, was the isotope usually shielded?

- Yes
- No

36. During the duration of a procedure, how far from the patient were you usually standing?

- less than 3 feet
- 3-9 feet
- 10 feet or more

37. When performing DIAGNOSTIC RADIOISOTOPE procedures, what percentage of the time did you wear a protective apron?

- zero
- less than 25%
- 25-74%
- 75% or more

38. How many times did you perform, administer or assist with INTERNAL THERAPEUTIC RADIOISOTOPE procedures during a typical week at this longest job in the 1950s?

- zero [GO TO 43]
- 1 time per week
- 2 times per week
- 3 times per week
- more than 3 times per week

39. When performing INTERNAL THERAPEUTIC RADIOISOTOPE procedures, what percentage of the time did you wear a protective apron?

- zero
- less than 25%
- 25-74%
- 75% or more

40. When performing INTERNAL THERAPEUTIC RADIOISOTOPE procedures, what percentage of the time did you stand behind a shield or use a protective shield around the radioactive source?

- zero
- less than 25%
- 25-74%
- 75% or more

41. What percentage of the time were procedures done using afterloading (that is, when the radioactive source was remotely withdrawn from the safe and introduced into the patient through cables, etc.)?

- zero
- less than 25%
- 25-74%
- 75% or more

42. What percentage of the time were you responsible for maintaining the radioisotope sources used for implants in the safe, or transporting them to the patient?

- zero
- less than 25%
- 25-74%
- 75% or more

43. How many EXTERNAL BEAM THERAPY procedures did you perform or assist with during a typical week at this longest job in the 1950s?

- zero
- less than 25 per week
- 25-49 per week
- 50 or more per week
44. Did you work as a radiologic technologist between 1960 through 1969? □ Yes □ No → [GO TO 68 ON PAGE 12]

The following questions are about some types of radiologic procedures you may have worked or assisted with on the job you held the longest between 1960 and 1969. You don’t need to know exact answers. Just choose the answers that best fit your experience.

** ROUTINE DIAGNOSTIC X-RAY (such as chest x-rays, portable x-rays, mammograms, etc.) **

45. How many ROUTINE DIAGNOSTIC X-RAY procedures did you perform or assist with during a typical week at this longest job in the 1960s?

- □ zero [GO TO 51]
- □ less than 10 per week
- □ 10-24 per week
- □ 25-49 per week
- □ 50-99 per week
- □ 100 or more per week

46. When performing ROUTINE DIAGNOSTIC X-RAY procedures, what percentage of the time were you inside the room?

[Inside the room includes standing behind a shield or partial wall open to the patient. Outside means separated from the patient by the room walls and a door.]

- □ zero [GO TO 51]
- □ 25-74%
- □ less than 25%
- □ 75% or more

47. When performing ROUTINE DIAGNOSTIC X-RAY procedures, what percentage of the time did you wear a protective apron?

- □ zero
- □ 25-74%
- □ less than 25%
- □ 75% or more

48. When performing ROUTINE DIAGNOSTIC X-RAY procedures, what percentage of the time did you stand behind a screen, shield or other protective enclosure?

- □ zero [GO TO 50]
- □ 25-74%
- □ less than 25%
- □ 75% or more

49. How high did the screen, shield or other protective enclosure extend?

- □ above the head
- □ up to the shoulders
- □ up to the waist

50. When performing ROUTINE DIAGNOSTIC X-RAY procedures, what percentage of patients being x-rayed did you hold during the procedure?

- □ zero
- □ less than 10%
- □ 10-24%
- □ 25% or more

** FLUOROSCOPY (such as angiograms, barium swallows, etc.) **

51. How many FLUOROSCOPY procedures did you perform or assist with during a typical week at this longest job in the 1960s?

- □ zero [GO TO 57]
- □ 25-49 per week
- □ less than 10 per week
- □ 50-99 per week
- □ 10-24 per week
- □ 100 or more per week

52. When performing FLUOROSCOPY procedures, what percentage of the time were you inside the room?

- □ zero [GO TO 56]
- □ 25-74%
- □ less than 25%
- □ 75% or more

53. When performing FLUOROSCOPY procedures, what percentage of the time did you wear a protective apron?

- □ zero
- □ 25-74%
- □ less than 25%
- □ 75% or more

54. When performing FLUOROSCOPY procedures, what percentage of the time did you stand behind a screen, shield or other protective enclosure?

- □ zero [GO TO 56]
- □ 25-74%
- □ less than 25%
- □ 75% or more

55. How high did the screen, shield or other protective enclosure extend?

- □ above the head
- □ up to the shoulders
- □ up to the waist

56. Excluding set-up time, what percentage of the FLUOROSCOPY procedures that you performed or assisted with were more than 15 minutes long?

- □ zero
- □ less than 25%
- □ 25-49%
- □ 50% or more
57. How many DIAGNOSTIC RADIOISOTOPE procedures (injections or oral procedures) did you perform or assist with during a typical week at this longest job in the 1960s?

<table>
<thead>
<tr>
<th>Options</th>
<th>Frequency</th>
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</thead>
<tbody>
<tr>
<td>zero</td>
<td>[GO TO 62]</td>
</tr>
<tr>
<td>less than 10 per week</td>
<td>25-49 per week</td>
</tr>
<tr>
<td>10-24 per week</td>
<td>50-99 per week</td>
</tr>
<tr>
<td>10 or more per week</td>
<td>100 or more per week</td>
</tr>
</tbody>
</table>

58. When working with DIAGNOSTIC RADIOISOTOPES, how many times did you prepare the radiopharmaceutical kit and/or elute generators (i.e., separate and measure a concentrated amount of isotope from its source for use in a radiopharmaceutical kit) during a typical week at this longest job?

<table>
<thead>
<tr>
<th>Options</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>zero</td>
<td>25-49 per week</td>
</tr>
<tr>
<td>1-9 per week</td>
<td>50+ per week</td>
</tr>
<tr>
<td>10-24 per week</td>
<td></td>
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</tbody>
</table>

59. When performing injections, or administrations, was the isotope usually shielded?

<table>
<thead>
<tr>
<th>Options</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>No</td>
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</tbody>
</table>

60. During the duration of a procedure, how far from the patient were you usually standing?

<table>
<thead>
<tr>
<th>Options</th>
<th>Distance</th>
</tr>
</thead>
<tbody>
<tr>
<td>less than 3 feet</td>
<td>3-9 feet</td>
</tr>
<tr>
<td>10 feet or more</td>
<td></td>
</tr>
</tbody>
</table>

61. When performing DIAGNOSTIC RADIOISOTOPE procedures, what percentage of the time did you wear a protective apron?

<table>
<thead>
<tr>
<th>Options</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>zero</td>
<td>25-74%</td>
</tr>
<tr>
<td>less than 25%</td>
<td>75% or more</td>
</tr>
</tbody>
</table>

62. How many times did you perform, administer or assist with INTERNAL THERAPEUTIC RADIOISOTOPE procedures during a typical week at this longest job in the 1960s?

<table>
<thead>
<tr>
<th>Options</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>zero</td>
<td>[GO TO 67]</td>
</tr>
<tr>
<td>1 time per week</td>
<td>3 times per week</td>
</tr>
<tr>
<td>2 times per week</td>
<td>more than 3 times per week</td>
</tr>
</tbody>
</table>

63. When performing INTERNAL THERAPEUTIC RADIOISOTOPE procedures, what percentage of the time did you wear a protective apron?

<table>
<thead>
<tr>
<th>Options</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>zero</td>
<td>25-74%</td>
</tr>
<tr>
<td>less than 25%</td>
<td>75% or more</td>
</tr>
</tbody>
</table>

64. When performing INTERNAL THERAPEUTIC RADIOISOTOPE procedures, what percentage of the time did you stand behind a shield or use a protective shield around the radioactive source?

<table>
<thead>
<tr>
<th>Options</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>zero</td>
<td>25-74%</td>
</tr>
<tr>
<td>less than 25%</td>
<td>75% or more</td>
</tr>
</tbody>
</table>

65. What percentage of the time were procedures done using afterloading (that is, when the radioactive source was remotely withdrawn from the safe and introduced into the patient through cables, etc.)?

<table>
<thead>
<tr>
<th>Options</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>zero</td>
<td>25-74%</td>
</tr>
<tr>
<td>less than 25%</td>
<td>75% or more</td>
</tr>
</tbody>
</table>

66. What percentage of the time were you responsible for maintaining the radioisotope sources used for implants in the safe, or transporting them to the patient?

<table>
<thead>
<tr>
<th>Options</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>zero</td>
<td>25-74%</td>
</tr>
<tr>
<td>less than 25%</td>
<td>75% or more</td>
</tr>
</tbody>
</table>

67. How many EXTERNAL BEAM THERAPY procedures did you perform or assist with during a typical week at this longest job in the 1960s?

<table>
<thead>
<tr>
<th>Options</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>zero</td>
<td>25-49 per week</td>
</tr>
<tr>
<td>less than 25 per week</td>
<td>50 or more per week</td>
</tr>
</tbody>
</table>

EXTERNAL RADIATION THERAPY

(such as a betatron, Cobalt-60 teletherapy, Orthovoltage machine or linear accelerator, deep therapy, etc.)
68. Did you work as a radiologic technologist between 1970 through 1979? □ Yes  □ No → [GO TO 92 ON PAGE 14]

The following questions are about some types of radiologic procedures you may have worked or assisted with on the job you held the longest between 1970 and 1979. You don’t need to know exact answers. Just choose the answers that best fit your experience.

**ROUTINE DIAGNOSTIC X-RAY**  
(such as chest x-rays, portable x-rays, mammograms, etc.)

69. How many ROUTINE DIAGNOSTIC X-RAY procedures did you perform or assist with during a typical week at this longest job in the 1970s?

- □ zero [GO TO 75] □ 25-49 per week
- □ less than 10 per week □ 50-99 per week
- □ 10-24 per week □ 100 or more per week

70. When performing ROUTINE DIAGNOSTIC X-RAY procedures, what percentage of the time were you inside the room?  
[Inside the room includes standing behind a shield or partial wall open to the patient. Outside means separated from the patient by the room walls and a door.]

- □ zero [GO TO 75] □ 25-74%
- □ less than 25% □ 75% or more

71. When performing ROUTINE DIAGNOSTIC X-RAY procedures, what percentage of the time did you wear a protective apron?

- □ zero □ 25-74%
- □ less than 25% □ 75% or more

72. When performing ROUTINE DIAGNOSTIC X-RAY procedures, what percentage of the time did you stand behind a screen, shield or other protective enclosure?

- □ zero [GO TO 74] □ 25-74%
- □ less than 25% □ 75% or more

73. How high did the screen, shield or other protective enclosure extend?

- □ above the head
- □ up to the shoulders
- □ up to the waist

74. When performing ROUTINE DIAGNOSTIC X-RAY procedures, what percentage of patients being x-rayed did you hold during the procedure?

- □ zero □ 10-24%
- □ less than 10% □ 25% or more

**FLUOROSCOPY**  
(such as angiograms, barium swallows, etc.)

75. How many FLUOROSCOPY procedures did you perform or assist with during a typical week at this longest job in the 1970s?

- □ zero [GO TO 81] □ 25-49 per week
- □ less than 10 per week □ 50-99 per week
- □ 10-24 per week □ 100 or more per week

76. When performing FLUOROSCOPY procedures, what percentage of the time were you inside the room?

- □ zero [GO TO 80] □ 25-74%
- □ less than 25% □ 75% or more

77. When performing FLUOROSCOPY procedures, what percentage of the time did you wear a protective apron?

- □ zero □ 25-74%
- □ less than 25% □ 75% or more

78. When performing FLUOROSCOPY procedures, what percentage of the time did you stand behind a screen, shield or other protective enclosure?

- □ zero [GO TO 80] □ 25-74%
- □ less than 25% □ 75% or more

79. How high did the screen, shield or other protective enclosure extend?

- □ above the head
- □ up to the shoulders
- □ up to the waist

80. Excluding set-up time, what percentage of the FLUOROSCOPY procedures that you performed or assisted with were more than 15 minutes long?

- □ zero □ 25-49%
- □ less than 25% □ 50% or more
81. How many DIAGNOSTIC RADIOISOTOPE procedures (injections or oral procedures) did you perform or assist with during a typical week at this longest job in the 1970s?
- zero [GO TO 86]
- less than 10 per week
- 10-24 per week
- 25-49 per week
- 50-99 per week
- 100 or more per week

82. When working with DIAGNOSTIC RADIOISOTOPE, how many times did you prepare the radiopharmaceutical kit and/or elute generators (i.e., separate and measure a concentrated amount of isotope from its source for use in a radiopharmaceutical kit) during a typical week at this longest job?
- zero
- 1-9 per week
- 10-24 per week
- 25-49 per week
- 50-99 per week
- 100 or more per week

83. When performing injections, or administrations, was the isotope usually shielded?
- Yes
- No

84. During the duration of a procedure, how far from the patient were you usually standing?
- less than 3 feet
- 3-9 feet
- 10 feet or more

85. When performing DIAGNOSTIC RADIOISOTOPE procedures, what percentage of the time did you wear a protective apron?
- zero
- less than 25%
- 25-74%
- 75% or more

86. How many times did you perform, administer or assist with INTERNAL THERAPEUTIC RADIOISOTOPE procedures during a typical week at this longest job in the 1970s?
- zero [GO TO 91]
- 1 time per week
- 2 times per week
- 3 times per week
- more than 3 times per week

87. When performing INTERNAL THERAPEUTIC RADIOISOTOPE procedures, what percentage of the time did you wear a protective apron?
- zero
- less than 25%
- 25-74%
- 75% or more

88. When performing INTERNAL THERAPEUTIC RADIOISOTOPE procedures, what percentage of the time did you stand behind a shield or use a protective shield around the radioactive source?
- zero
- less than 25%
- 25-74%
- 75% or more

89. What percentage of the time were procedures done using afterloading (that is, when the radioactive source was remotely withdrawn from the safe and introduced into the patient through cables, etc.)?
- zero
- less than 25%
- 25-74%
- 75% or more

90. What percentage of the time were you responsible for maintaining the radioisotope sources used for implants in the safe, or transporting them to the patient?
- zero
- less than 25%
- 25-74%
- 75% or more

91. How many EXTERNAL BEAM THERAPY procedures did you perform or assist with during a typical week at this longest job in the 1970s?
- zero
- 1-9 per week
- 10-24 per week
- 25-49 per week
- 50 or more per week
92. Did you work as a radiologic technologist after 1980 through the present?  
☐ Yes  ☐ No → [GO TO 116 ON PAGE 16]

The following questions are about some types of radiologic procedures you may have worked or assisted with on the job you held the longest from 1980 through the present. You don’t need to know exact answers. Just choose the answers that best fit your experience.

**ROUTINE DIAGNOSTIC X-RAY**  
(such as chest x-rays, portable x-rays, mammograms, etc.)

93. How many ROUTINE DIAGNOSTIC X-RAY procedures did you perform or assist with during a typical week at this longest job from 1980 to the present?  
☐ zero [GO TO 99]  ☐ 25-49 per week  
☐ less than 10 per week  ☐ 50-99 per week  
☐ 10-24 per week  ☐ 100 or more per week

94. When performing ROUTINE DIAGNOSTIC X-RAY procedures, what percentage of the time were you inside the room?  
[Inside the room includes standing behind a shield or partial wall open to the patient. Outside means separated from the patient by the room walls and a door.]  
☐ zero [GO TO 99]  ☐ 25-74%  
☐ less than 25%  ☐ 75% or more

95. When performing ROUTINE DIAGNOSTIC X-RAY procedures, what percentage of the time did you wear a protective apron?  
☐ zero  ☐ 25-74%  
☐ less than 25%  ☐ 75% or more

96. When performing ROUTINE DIAGNOSTIC X-RAY procedures, what percentage of the time did you stand behind a screen, shield or other protective enclosure?  
☐ zero [GO TO 98]  ☐ 25-74%  
☐ less than 25%  ☐ 75% or more

97. How high did the screen, shield or other protective enclosure extend?  
☐ above the head  ☐ up to the shoulders  
☐ up to the waist

98. When performing ROUTINE DIAGNOSTIC X-RAY procedures, what percentage of patients being x-rayed did you hold during the procedure?  
☐ zero  ☐ 10-24%  
☐ less than 10%  ☐ 25% or more

**FLUOROSCOPY**  
(such as angiograms, barium swallows, etc.)

99. How many FLUOROSCOPY procedures did you perform or assist with during a typical week at this longest job from 1980 to the present?  
☐ zero [GO TO 105]  ☐ 25-49 per week  
☐ less than 10 per week  ☐ 50-99 per week  
☐ 10-24 per week  ☐ 100 or more per week

100. When performing FLUOROSCOPY procedures, what percentage of the time were you inside the room?  
☐ zero [GO TO 104]  ☐ 25-74%  
☐ less than 25%  ☐ 75% or more

101. When performing FLUOROSCOPY procedures, what percentage of the time did you wear a protective apron?  
☐ zero  ☐ 25-74%  
☐ less than 25%  ☐ 75% or more

102. When performing FLUOROSCOPY procedures, what percentage of the time did you stand behind a screen, shield or other protective enclosure?  
☐ zero [GO TO 104]  ☐ 25-74%  
☐ less than 25%  ☐ 75% or more

103. How high did the screen, shield or other protective enclosure extend?  
☐ above the head  ☐ up to the shoulders  
☐ up to the waist

104. Excluding set-up time, what percentage of the FLUOROSCOPY procedures that you performed or assisted with were more than 15 minutes long?  
☐ zero  ☐ 25-49%  
☐ less than 25%  ☐ 50% or more
105. How many DIAGNOSTIC RADIOISOTOPE procedures (injections or oral procedures) did you perform or assist with during a typical week at this longest job from 1980 to the present?
- zero [GO TO 110]
- 25-49 per week
- less than 10 per week 50-99 per week
- 10-24 per week 100 or more per week

106. When working with DIAGNOSTIC RADIOISOTOPEs, how many times did you prepare the radiopharmaceutical kit and/or elute generators (i.e., separate and measure a concentrated amount ofisotope from its source for use in a radiopharmaceutical kit) during a typical week at this longest job?
- zero
- 1-9 per week
- 10-24 per week

107. When performing injections, or administrations, was the isotope usually shielded?
- Yes
- No

108. During the duration of a procedure, how far from the patient were you usually standing?
- less than 3 feet
- 3-9 feet
- 10 feet or more

109. When performing DIAGNOSTIC RADIOISOTOPE procedures, what percentage of the time did you wear a protective apron?
- zero
- less than 25%
- 25-74%
- 75% or more

111. When performing INTERNAL THERAPEUTIC RADIOISOTOPE procedures, what percentage of the time did you wear a protective apron?
- zero
- 25-74%
- less than 25%
- 75% or more

112. When performing INTERNAL THERAPEUTIC RADIOISOTOPE procedures, what percentage of the time did you stand behind a shield or use a protective shield around the radioactive source?
- zero
- 25-74%
- less than 25%
- 75% or more

113. What percentage of the time were procedures done using afterloading (that is, when the radioactive source was remotely withdrawn from the safe and introduced into the patient through cables, etc.)?
- zero
- 25-74%
- less than 25%
- 75% or more

114. What percentage of the time were you responsible for maintaining the radioisotope sources used for implants in the safe, or transporting them to the patient?
- zero
- less than 25%
- 25-74%
- 75% or more

110. How many times did you perform, administer or assist with INTERNAL THERAPEUTIC RADIOISOTOPE procedures during a typical week at this longest job from 1980 to the present?
- zero [GO TO 115]
- 1 time per week
- 2 times per week

115. How many EXTERNAL BEAM THERAPY procedures did you perform or assist with during a typical week at this longest job from 1980 to the present?
- zero
- 25-49 per week
- less than 25 per week
- more than 3 times per week
The following questions pertain to any job you may have held as a radiologic technologist.

116. As a radiologic technologist, were you ever removed from any job because you had exceeded a radiation protection limit?

- Yes
- No [GO TO 119]

117. If YES, how many times . . . ?

- 1 to 2 times
- 3 or 4 times
- 5 or more times

118. In what year were you first removed from a job for this reason?

- YYYY YEAR

119. While you worked as a radiologic technologist, was your white blood cell count ever found to be below normal due to your work as a radiologic technologist?

- Yes
- No [GO TO 122]

120. If YES, how many times . . . ?

- 1 to 2 times
- 3 or 4 times
- 5 or more times

121. In what year were you first told that your white blood cell count was below normal due to your work as a radiologic technologist?

- YYYY YEAR

122. Did you ever work with radiation in a non-medical job?

- Yes
- No [GO TO 126]

123. What year did you start?

- YYYY YEAR

124. What year did you stop?

- YYYY YEAR

125. Briefly describe the type of business and radiation procedures you performed on this job?

- ___________________________

- ___________________________

- ___________________________

- ___________________________

- ___________________________
**SUN EXPOSURE**

The following questions focus on your complexion and your exposure to the sun.

126. What is the natural color of your eyes?
   - Blue
   - Green/blue or green/grey
   - Hazel (light brown or yellow with blue or green flecks)
   - Light brown
   - Dark brown
   - Other: __________________________________________

127. What was your natural hair color when you were 20 years old . . .
   - Blonde
   - Red
   - Reddish-brown
   - Light brown
   - Medium brown
   - Dark brown
   - Black
   - Other: __________________________________________

128. Do you have a light, medium or dark complexion?
   - Light
   - Medium
   - Dark
   - Other: __________________________________________

129. How would your skin react if you had no tan the first time in summer you were exposed to strong sunlight for 30 minutes without protective sunscreen? Strong sunlight means noonday sunlight on the brightest, clearest day in summer. Would you . . .
   - Get a severe sunburn with blisters
   - Get a painful sunburn but no blisters
   - Get a mild sunburn followed by some suntan
   - Become tanned without any sunburn
   - No change in skin color

130. After repeated and prolonged exposure to sunlight, would your skin become . . .
   - Very brown and deeply tanned
   - Moderately tanned
   - Lightly tanned
   - Not tanned at all

131. Were you ever sunburnt so severely as to cause blisters?
   - Yes
   - No [GO TO 134]

132. How many times did this happen before age 15?
   - # of blistering sunburns

133. How many times did this happen from age 15 to the age you are now?
   - # of blistering sunburns
134. The next questions are about where you lived at different ages and about the amount of time you spent in the sun at those ages. Be sure to include time in the sun on vacations, at work and where you lived. (Leave blank if age group is not applicable to you.)

When you were (AGE), where did you live the longest?

<table>
<thead>
<tr>
<th>AGE</th>
<th>CITY</th>
<th>STATE</th>
<th>COUNTRY (If outside USA)</th>
<th>CITY</th>
<th>STATE</th>
<th>COUNTRY (If outside USA)</th>
<th>CITY</th>
<th>STATE</th>
<th>COUNTRY (If outside USA)</th>
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<th>COUNTRY (If outside USA)</th>
<th>CITY</th>
<th>STATE</th>
<th>COUNTRY (If outside USA)</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. Under 13 years old</td>
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<td>b. 13 to 19 years old</td>
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<td>c. 20 to 39 years old</td>
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<td>d. 40 to 64 years old</td>
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<td>e. Age 65 to present</td>
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</tbody>
</table>

135. When you were (this AGE), on weekDAYS in the summer (between the hours of 9AM and 3PM), about how many hours per day did you usually spend in strong sunlight?

- 0
- less than 1 hr
- 1-2 hrs
- 3-4 hrs
- 5-6 hrs

136. When you were (this AGE), on weekENDS in the summer (between the hours of 9AM and 3PM), about how many hours per day did you usually spend in strong sunlight?

- 0
- less than 1 hr
- 1-2 hrs
- 3-4 hrs
- 5-6 hrs
The final questions are about you and your spouse or partner’s education, marital status and income. We're asking these questions to allow us to compare participants in this study with those in other health studies and because these factors may also affect disease risk.

137. What is the highest level of education you have completed?
- 1-8 years (grade school)
- 9-12 years (high school)
- 2-year hospital radiologic technology program
- 1-4 years college
- Graduate school
- Other (e.g. vocational)

138. What is your current marital status?
- Never married [GO TO 140]
- Married
- Living together but not married
- Divorced
- Widowed
- Separated

139. What was the highest level of education your (current/former) spouse or partner completed? If you've had more than one spouse or partner, please answer about the one you were with the longest.
- 1-8 years (grade school)
- 9-12 years (high school)
- 2-year hospital radiologic technology program
- 1-4 years college
- Graduate school
- Other (e.g. vocational)

140. Which of the categories below best describes your current total annual household income before taxes? Please include all sources of income for all members of your household.
- Less than $25,000
- $25,000-$49,999
- $50,000-$74,999
- $75,000-$99,999
- $100,000 or more

141. In case we need to contact you, please provide your daytime and/or evening telephone number.

Daytime number:

Area code - Phone number

Evening number:

Area code - Phone number

142. Would you be willing to answer a future questionnaire over the internet using a secure website?
- Yes
- No, not willing
- No, do not have access to internet

Thank you for taking the time to complete this questionnaire.

If you would like to provide additional comments, please use the back of the survey.
We regret that we are unable to respond to individual questions at this time. If you have questions or concerns about your health, we encourage you to discuss these matters with your personal physician. We welcome your comments about the survey as this information may help us plan for the study in the future.

Do you have any comments about this survey?

What would you like to see in the future newsletters to participants in this study?