Radiation Therapy, Management and Dosimetry Workplace Survey 2010

A Nationwide Survey Conducted by the American Society of Radiologic Technologists
With Support from Varian Medical Systems

November 2010
**Table of Contents**

**Executive Summary** ................................................................. 1
Demographics................................................................................. 1
Facility Demographics and Staffing .................................................. 1
Clinical Skills ................................................................................. 1
Daily Practices................................................................................ 2
Technological Impacts .................................................................... 2

**Demographics** ........................................................................... 3
Primary area of work...................................................................... 3
State.............................................................................................. 3
Other geographical areas represented.................................................. 4
Age................................................................................................. 4
How long have you worked in your discipline?...................................... 5
From what type of educational program did you graduate to qualify for the registry exam?.................................................. 6
Check all of the disciplines in which you are certified: .............................. 7
If you are not certified in your discipline, and you do not plan to take the certification exam in the future, why not?.................................................. 8
If you are no longer working in the profession, how many years did you work in your discipline?.................................................. 9
Choose the primary reason why you are unemployed or employed outside of radiation therapy.................................................. 10

**Facility Demographics and Staffing** .......................................... 11
Which of the following services does your facility provide?...................... 11
In terms of staffing levels, how would you describe your facility?...................... 12
If “understaffed,” choose the primary reason why you believe this is the case.................................................. 13
Mean patients treated per day and mean therapists per linear accelerator by staffing level.................................................. 14
Mean patients treated per day by staffing level .................................................. 14
Mean patients treated per linear accelerator by staffing level.......................... 14
Do you perform treatments as a part of your professional duties?.................................................. 15
If you perform treatments as a part of your professional duties, for how many years?.................................................. 16
Do you supervise those who perform treatments?.................................................. 17
If you supervise those who perform treatments, for how many years?.................................................. 18
Approximately how many patients are treated daily at your facility?...................... 19
How many linear accelerators are used in your facility?................................. 20
Patients treated per day by number of linear accelerators per facility.................. 20
Patients treated per day per linear accelerator.................................................. 21
On average, how many therapists per linear accelerator are routinely scheduled at your facility?.............................. 22
On average, how many dosimetrists per linear accelerator are routinely scheduled at your facility?.............................. 23
How many, if any, hours per day does your facility routinely schedule one therapist per linear accelerator? (Rounded to the nearest hour.).................................................. 24
How many dosimetrists are employed at your facility?........................................ 25
Do you have a physicist at your facility daily?.................................................. 26
If you selected “yes” on the previous question, how many full-time equivalent physicists do you have? (Rounded to the nearest whole number).................................................. 27
Patients treated per day by number of physicists employed.............................. 27
If you selected “no” to the above question, how many hours per week do you have on-site physics support?.................................................. 28
Patients treated per day by hours per week a physicist is on-site.......................... 29
Patients treated per day by physicist on-site less than 8 hours per day.................................................. 29

**Clinical Skills** ............................................................................. 30
Questions for Managers on the Skills of Staff

When provided the appropriate level of supervision, what percent of the procedures in your department could you perform? ................................................................. 30

If you indicated anything other than “100%” in the previous question, which procedures were you least prepared to perform? (Coded from verbatim responses.) ................................................................. 31

In your opinion, the lack of skills with new graduates you hire due primarily to: ................................................................. 32

Do you believe there is a difference in skills of students graduating from different types of programs? ................. 33

In your experience, compared to therapists with three or five years of experience, new graduates are: ................ 34

Daily Practices

Does your facility’s policy require that IMRT/VMAT have plan-specific quality assurance (QA) procedures performed prior to the first day of treatment? ................................................................. 35

If you selected “yes” on the previous question, who performs this second check? ................................................................. 35

Does your facility use remote planning services? ................................................................................................. 36

What method of patient verification does your facility employ? ................................................................................................. 36

Does your facility’s policy require that another person perform a second check on 2-D and 3-D treatment plans before the first day of treatment? ................................................................. 37

If you selected “yes” that your facility’s policy requires that another person perform a second check on 2-D and 3-D treatment plans before the first day of treatment, who performs this second check? ................................................................................................. 37

What treatment imaging protocols does your facility use? ................................................................................................. 38

When does your facility require that all planned treatment parameters be manually verified by the treating therapist at the treatment machine? ................................................................. 39

What is the primary distraction in your clinical setting? (Coded from verbatim responses.) ................................................................. 40

Does your department track errors in the clinical setting? ................................................................................................. 41

Technological Impacts

How have technological developments over the past five years affected the number of patients you and your coworkers can treat in a given week? ................................................................................................. 42

How have technological developments over the past five years affected the quality of care you are able to deliver to patients? ................................................................................................. 43

What other effects have technological developments had on your department over the past few years? (Coded from verbatim responses.) ................................................................. 44

How would you rate your eagerness, as well as your ability, to adapt to and make use of technological developments in your practice? ................................................................................................. 45

When implementing new technology do you feel that you are adequately prepared to begin using the technology? ................................................................................................. 46

How intuitive is the equipment you work with? ................................................................................................. 47

What are the key factors that would help you adopt new clinical capabilities at your center? ................................................................................................. 48

Are there areas in your discipline that have become so unique and specialized that they warrant special recognition through certification? ................................................................................................. 49

If you selected “yes” on the previous question, what are the areas that should be separately certified? (Coded from verbatim responses.) ................................................................................................. 50

Continuing Education

On average, how many hours each month do you spend on remote learning outside of the workplace? ................................................................. 51

What is the ideal duration, in minutes, for a remote training session? ................................................................................................. 51

Do you, as a manager, have the latitude to facilitate time for training activities (vendor or otherwise)? ................................................................. 52

Please indicate if you have participated in any of the following learning events in the past two years. ................................................................................................. 53

What sources of information do you use to keep up to date on advances in your discipline? ................................................................................................. 54

Where do you find available CE opportunities? ................................................................................................. 55

Aside from the mandatory nature of CE, what do you primarily hope to gain from CE products? ................................................................................................. 56

Appendix A. Survey Instruments and Invitation Letter (Please contact ASRT Member Services for a copy.)

Appendix B. Verbatim responses (Please contact ASRT Member Services for a copy.)
Executive Summary

In July 2010 an invitation to participate in one of three workplace surveys was sent via e-mail to 14,405 radiation therapists, dosimetrists and radiation therapist managers. At the close of the survey on August 27, 2010, a total of 3,355 responses had been received from 2,429 radiation therapists, 567 dosimetrists and 359 managers, yielding an overall response rate of 23.3%.

<table>
<thead>
<tr>
<th></th>
<th>Return</th>
<th>Estimated Population</th>
<th>Percent Sampled</th>
<th>Margin of Error at the 95% Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>Radiation Therapists</td>
<td>2,429</td>
<td>18,762</td>
<td>12.9%</td>
<td>±1.9%</td>
</tr>
<tr>
<td>Dosimetrists</td>
<td>567</td>
<td>2,763</td>
<td>20.5%</td>
<td>±3.7%</td>
</tr>
<tr>
<td>Facility Managers</td>
<td>359</td>
<td>2,613</td>
<td>13.7%</td>
<td>±4.8%</td>
</tr>
<tr>
<td>Overall</td>
<td>3,355</td>
<td>24,138</td>
<td>13.9%</td>
<td>±1.6%</td>
</tr>
</tbody>
</table>

Demographics

- The mean age of all respondents was 42.7 years.
- Respondents on average have worked for 13.2 years in their specialty.
- Slightly more than 32% of respondents graduated from a radiography plus 1-year certification program; 25.3% graduated from an associate degree program and 22.8% from a bachelor’s degree program.
- About 84% of the medical dosimetrists who participated in the survey indicated that they were certified in the specialty, and 99.5% of the radiation therapists indicated that they were certified in radiation therapy. Similarly for managers, 96% indicated that they were certified in radiation therapy.
- Approximately 54% of radiation therapists, 62% of dosimetrists and 60% of managers indicated that they were also certified in radiography.

Facility Demographics and Staffing

- The top three services provided by facilities were intensity modulated radiation therapy, or IMRT (96.1%), computed tomography/simulation (93.7%), and conformal radiation therapy delivery (90.7%).
- Most (69.6%) respondents rated that their facility is “appropriately staffed.”
  - When broken down by position, 29% of therapists indicated that their facility was “understaffed,” which was significantly higher than managers and dosimetrists.
  - Of those respondents who indicated being “understaffed,” 45.9% cited that the number of budgeted full-time employees is too low for the department’s workload.
- About a third (33.7%) of therapists and dosimetrists indicated that they supervise others who perform treatments, with a significantly higher percentage of therapists supervising than dosimetrists, and doing so for more years.
- Respondents indicated that their facility has on average:
  - 59 patients daily.
  - 2.33 linear accelerators.
  - 25.8 patients per day, per linear accelerator.
  - 2.32 therapists scheduled per linear accelerator.
  - 1.24 dosimetrists scheduled per linear accelerator.
  - 1.73 hours where there is only one therapist per linear accelerator.
  - 2.75 dosimetrists employed at their facility.
- Most (80.4%) facilities have a physicist on site daily.
  - Facilities with on-site physicists employ on average 2.96 physicists, and those facilities that do not have full-time on-site physicists have a physicist an average of 13.95 hours per week.

Clinical Skills

- When provided the appropriate supervision, therapists and dosimetrists feel that they can perform on average 95.6% of the procedures offered in their departments.
  - Procedures highlighted as difficult by respondents included simulations (50.4%), HDR (17.9%) and Brachotherapy (15.8%).
- When asked specific questions concerning the skills of recent graduates, managers indicated that:
  - New graduates can perform an average 84.7% of the procedures offered in their departments when provided with the appropriate supervision.
- For those who cannot perform the procedures, 15.3% attribute this to educational programs, 12.9% to individual characteristics and more than a fourth (28.5%) to both equally.
  - Eighty percent were fully satisfied with new graduates' skills.
  - A difference in skills exists between graduates from different types of programs (66.4%).
  - Compared with therapists 3 to 5 years ago, new graduates' skills are not equivalent (60.4%).

**Daily Practices**
- Three-fourths (74.8%) of therapists indicated that their facility requires that IMRT/volumetric modulated arc therapy have a plan-specific quality assurance procedure performed before the first day of treatment.
  - Most (94.8%) of the respondents indicated that a physicist performs this check, and 10.7% indicated that dosimetrists do so.
- Nearly 16% of respondents indicated that their facility uses remote planning.
- Approximately 60.4% of facilities use photo verification as a method of patient verification; 55.4% use verbal confirmation and 22.7% use wrist bands or ID cards.
- Slightly more than 84% of dosimetrists indicated that their facility's policy requires a second check on 2-D and 3-D treatment plans before the first day of treatment.
  - Of those who require a second check, 75.9% indicated that it is performed by a physicist.
- Respondents indicated that their facility:
  - Uses the following imaging protocols: all fields before or on day one (52.3%), weekly MV imaging (44.3%) and cone-beam CT (32.6%).
  - Requires treatment parameters to be manually verified:
    - On the first day of treatment (80.1%).
    - Following any plan modifications (55.9%).
    - Daily before treating (31.9%).
    - Weekly (12.8%).
    - Never (3.4%).
  - Has as the primary distraction people interrupting during treatments (25.4%).
  - Tracks errors (86.2%).

**Technological Impacts**
- When asked how technology has impacted the number of patients seen in a week and quality of treatments:
  - One-third (33.4%) indicated that it has had “very little impact” on the number of patients, and 31.6% indicated it has “somewhat increased.” Therapists rated the impact significantly higher than did dosimetrists, who rated the impact significantly higher than did managers.
  - Most (88.4%) indicated that technological developments have had at least “somewhat increased” to “greatly increased” the quality of care.
  - Verbatim responses indicated that respondents believe technology has affected the increase in accuracy of treatments (21.3%), the increase in complexity and time of their job (23.0%) and added stress (17.2%).
- Respondents indicated that:
  - They are eager to learn new technology (51.5%).
  - They feel prepared when implementing new technology (85.1%), with a significantly higher percentage of therapists and managers believing so than dosimetrists.
  - The equipment they work with is at least “somewhat intuitive” to “very intuitive” (76.7%).
Demographics

Primary area of work

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<th>Primary area of work</th>
<th>Frequency</th>
<th>Percent</th>
<th>Valid Percent</th>
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</thead>
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<td>67.5</td>
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<tr>
<td>Dosimetry only</td>
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<td>14.3</td>
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<td>Manager</td>
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State:

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<td>WV</td>
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Other geographical areas represented:

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<td>Australia</td>
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<td>Canada</td>
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<tr>
<td>New Zealand</td>
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<tr>
<td>Switzerland</td>
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<tr>
<td>Virgin Islands</td>
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**Age**

<table>
<thead>
<tr>
<th>Age Range</th>
<th>Frequency</th>
<th>Percent</th>
<th>Valid Percent</th>
<th>Cumulative Percent</th>
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<tbody>
<tr>
<td>28 and lower</td>
<td>367</td>
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<td>12.4%</td>
<td>12.4%</td>
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<tr>
<td>29-49</td>
<td>1771</td>
<td>52.8%</td>
<td>60.0%</td>
<td>72.4%</td>
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<td>50-67</td>
<td>812</td>
<td>24.2%</td>
<td>27.5%</td>
<td>99.9%</td>
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<tr>
<td>68 and higher</td>
<td>2</td>
<td>0.1%</td>
<td>0.1%</td>
<td>100.0%</td>
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<tr>
<td><strong>Total</strong></td>
<td>2952</td>
<td>88.0%</td>
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<tr>
<td><strong>Missing</strong></td>
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<tr>
<td><strong>Total</strong></td>
<td>3355</td>
<td>100.0%</td>
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</table>

Mean Age: 42.7 (SD=10.30)

Percentiles: 5th=25.8, 25th=34.2, 50th=43.1, 75th=51.0, 95th=58.7
## How long have you worked in your discipline?

<table>
<thead>
<tr>
<th></th>
<th>Frequency</th>
<th>Percent</th>
<th>Valid Percent</th>
<th>Cumulative Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 to 5 years</td>
<td>819</td>
<td>24.4</td>
<td>31.0</td>
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<tr>
<td>6 to 10 years</td>
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<td>19.1</td>
<td>24.2</td>
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<td>11 to 15 years</td>
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<td>12.6</td>
<td>16.0</td>
<td>71.2</td>
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<tr>
<td>16 to 20 years</td>
<td>456</td>
<td>13.6</td>
<td>17.2</td>
<td>88.4</td>
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<td>21 to 25 years</td>
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<td>8.2</td>
<td>10.4</td>
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<td>26 years or more</td>
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<td>1.0</td>
<td>1.2</td>
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<td><strong>Missing</strong></td>
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<td><strong>21.2</strong></td>
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<tr>
<td><strong>Total</strong></td>
<td><strong>3355</strong></td>
<td><strong>100.0</strong></td>
<td></td>
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</tbody>
</table>

**Mean years worked** 13.20 (SD=9.46)

Percentiles 5th=1.6, 25th=5.0, 50th=10.9, 75th=19.8, 95th=30.8
From what type of educational program did you graduate to qualify for the registry exam?

<table>
<thead>
<tr>
<th>Educational Program</th>
<th>Frequency</th>
<th>Percent</th>
<th>Valid Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>R.T. (R) plus 1-year certification</td>
<td>852</td>
<td>25.4</td>
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<td>2-year certificate program</td>
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<td>Associate degree program</td>
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<tr>
<td>Bachelor’s degree program, with general education satisfied</td>
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<td>9.9</td>
<td>12.5</td>
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<tr>
<td>prior to beginning didactic and clinical work.</td>
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<tr>
<td>Bachelor’s degree program, with general education satisfied</td>
<td>52</td>
<td>1.5</td>
<td>2.0</td>
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<tr>
<td>after didactic and clinical work were completed.</td>
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<tr>
<td>Bachelor’s degree program, with general education</td>
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<td>6.5</td>
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<td>integrated with didactic and clinical work.</td>
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<tr>
<td>Bachelor’s degree program, followed by a therapy/dosimetry</td>
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<td>2.8</td>
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<td>Total</td>
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From what type of educational program did you graduate to qualify for the registry exam?
Check all of the disciplines in which you are certified:

<table>
<thead>
<tr>
<th>Discipline</th>
<th>Radiation Therapist</th>
<th>Manager</th>
<th>Dosimetrists</th>
</tr>
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<tbody>
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<td>Radiography</td>
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<td>337</td>
</tr>
<tr>
<td>%</td>
<td>53.7%</td>
<td>60.0%</td>
<td>61.8%</td>
</tr>
<tr>
<td>Radiation therapy</td>
<td>2102</td>
<td>322</td>
<td>538</td>
</tr>
<tr>
<td>%</td>
<td>99.5%</td>
<td>96.1%</td>
<td>98.7%</td>
</tr>
<tr>
<td>Nuclear medicine</td>
<td>2</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td>%</td>
<td>0.1%</td>
<td>0.9%</td>
<td>0.4%</td>
</tr>
<tr>
<td>Mammography</td>
<td>44</td>
<td>4</td>
<td>2</td>
</tr>
<tr>
<td>%</td>
<td>2.1%</td>
<td>1.2%</td>
<td>0.4%</td>
</tr>
<tr>
<td>Cardiovascular/interventional technology</td>
<td>3</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>%</td>
<td>0.1%</td>
<td>0.0%</td>
<td>0.0%</td>
</tr>
<tr>
<td>Computed tomography</td>
<td>55</td>
<td>10</td>
<td>14</td>
</tr>
<tr>
<td>%</td>
<td>2.6%</td>
<td>3.0%</td>
<td>2.6%</td>
</tr>
<tr>
<td>Magnetic resonance imaging</td>
<td>9</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>%</td>
<td>0.4%</td>
<td>0.6%</td>
<td>0.6%</td>
</tr>
<tr>
<td>Quality management</td>
<td>1</td>
<td>5</td>
<td>0</td>
</tr>
<tr>
<td>%</td>
<td>0.0%</td>
<td>1.5%</td>
<td>0.0%</td>
</tr>
<tr>
<td>Sonography</td>
<td>2</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>%</td>
<td>0.1%</td>
<td>0.3%</td>
<td>0.0%</td>
</tr>
<tr>
<td>Medical dosimetry</td>
<td>21</td>
<td>36</td>
<td>460</td>
</tr>
<tr>
<td>%</td>
<td>1.0%</td>
<td>10.7%</td>
<td>84.4%</td>
</tr>
<tr>
<td>Other</td>
<td>24</td>
<td>16</td>
<td>14</td>
</tr>
<tr>
<td>%</td>
<td>1.1%</td>
<td>4.8%</td>
<td>2.6%</td>
</tr>
</tbody>
</table>

Total Count: 2113 335 545

Check all of the disciplines in which you are certified:
If you are not certified in your discipline, and you do not plan to take the certification exam in the future, why not?

<table>
<thead>
<tr>
<th>Reason</th>
<th>Radiation Therapist</th>
<th>Manager</th>
<th>Dosimetrist</th>
</tr>
</thead>
<tbody>
<tr>
<td>I don’t consider my chances good enough to warrant the time and/or expense of taking it.</td>
<td>Count 6</td>
<td>0</td>
<td>8</td>
</tr>
<tr>
<td>%</td>
<td>3.8%</td>
<td>0.0%</td>
<td>22.2%</td>
</tr>
<tr>
<td>I hold a license from the state in which I work.</td>
<td>Count 114</td>
<td>11</td>
<td>6</td>
</tr>
<tr>
<td>%</td>
<td>71.3%</td>
<td>35.5%</td>
<td>16.7%</td>
</tr>
<tr>
<td>My state doesn’t require certification to practice my discipline.</td>
<td>Count 13</td>
<td>0</td>
<td>7</td>
</tr>
<tr>
<td>%</td>
<td>8.1%</td>
<td>0.0%</td>
<td>19.4%</td>
</tr>
<tr>
<td>I don’t need certification to validate my skills/understanding.</td>
<td>Count 6</td>
<td>3</td>
<td>11</td>
</tr>
<tr>
<td>%</td>
<td>3.8%</td>
<td>9.7%</td>
<td>30.6%</td>
</tr>
<tr>
<td>My employer doesn’t consider certification necessary.</td>
<td>Count 4</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>%</td>
<td>2.5%</td>
<td>0.0%</td>
<td>8.3%</td>
</tr>
<tr>
<td>Holding the ARRT certification would not be rewarded with higher pay.</td>
<td>Count 8</td>
<td>1</td>
<td>5</td>
</tr>
<tr>
<td>%</td>
<td>5.0%</td>
<td>3.2%</td>
<td>13.9%</td>
</tr>
<tr>
<td>Other</td>
<td>Count 21</td>
<td>17</td>
<td>19</td>
</tr>
<tr>
<td>%</td>
<td>13.1%</td>
<td>54.8%</td>
<td>52.8%</td>
</tr>
</tbody>
</table>

Total Count 160 31 36

If you are not certified in your discipline, and you do not plan to take the certification exam in the future, why not?

- Radiation Therapist
- Manager
- Dosimetrist

Bar chart showing the reasons why not certified.
### If you are no longer working in the profession, how many years did you work in your discipline?

<table>
<thead>
<tr>
<th></th>
<th>Frequency</th>
<th>Percent</th>
<th>Valid Percent</th>
<th>Cumulative Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 to 5 years</td>
<td>61</td>
<td>1.8</td>
<td>25.3</td>
<td>25.3</td>
</tr>
<tr>
<td>6 to 10 years</td>
<td>52</td>
<td>1.5</td>
<td>21.6</td>
<td>46.9</td>
</tr>
<tr>
<td>11 to 15 years</td>
<td>37</td>
<td>1.1</td>
<td>15.4</td>
<td>62.2</td>
</tr>
<tr>
<td>16 to 20 years</td>
<td>27</td>
<td>0.8</td>
<td>11.2</td>
<td>73.4</td>
</tr>
<tr>
<td>21 to 25 years</td>
<td>25</td>
<td>0.7</td>
<td>10.4</td>
<td>83.8</td>
</tr>
<tr>
<td>26 years or more</td>
<td>39</td>
<td>1.2</td>
<td>16.2</td>
<td>100.0</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>241</strong></td>
<td><strong>7.2</strong></td>
<td><strong>100.0</strong></td>
<td></td>
</tr>
</tbody>
</table>

Missing: 3114 (92.8%)

Total: 3355 (100.0%)

**Mean years worked**: 14.60 (SD=10.67)

Percentiles: 5th=1.5, 25th=5.5, 50th=12.0, 75th=22.6, 95th=37.2

### If you are no longer working in the profession, how many years did you work in your discipline?

- **0 to 5 years**: 25%
- **6 to 10 years**: 25%
- **11 to 15 years**: 20%
- **16 to 20 years**: 10%
- **21 to 25 years**: 7%
- **26 years or more**: 5%
Choose the primary reason why you are unemployed or employed outside of radiation therapy.

<table>
<thead>
<tr>
<th>Reason</th>
<th>Radiation Therapist</th>
<th>Manager</th>
<th>Dosimetrist</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Retirement</td>
<td>Count: 30</td>
<td>1</td>
<td>3</td>
<td>34</td>
</tr>
<tr>
<td></td>
<td>% 9.7%</td>
<td>7.7%</td>
<td>14.3%</td>
<td>9.9%</td>
</tr>
<tr>
<td>Career change</td>
<td>Count: 41</td>
<td>3</td>
<td>4</td>
<td>48</td>
</tr>
<tr>
<td></td>
<td>% 13.3%</td>
<td>23.1%</td>
<td>19.0%</td>
<td>14.0%</td>
</tr>
<tr>
<td>Job unavailability</td>
<td>Count: 118</td>
<td>1</td>
<td>6</td>
<td>125</td>
</tr>
<tr>
<td></td>
<td>% 38.2%</td>
<td>7.7%</td>
<td>28.6%</td>
<td>36.4%</td>
</tr>
<tr>
<td>Other</td>
<td>Count: 120</td>
<td>8</td>
<td>8</td>
<td>136</td>
</tr>
<tr>
<td></td>
<td>% 38.8%</td>
<td>61.5%</td>
<td>38.1%</td>
<td>39.7%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>Count: 309</strong></td>
<td><strong>13</strong></td>
<td><strong>21</strong></td>
<td><strong>343</strong></td>
</tr>
</tbody>
</table>

Choose the primary reason why you are unemployed or employed outside of radiation therapy.

![Bar chart showing the distribution of reasons for unemployment or employment outside of radiation therapy among Radiation Therapists, Managers, Dosimetrists, and the total.]
## Facility Demographics and Staffing

### Which of the following services does your facility provide?

<table>
<thead>
<tr>
<th>Service</th>
<th>N</th>
<th>Percent</th>
<th>Percent of Respondents</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intensity-modulated radiation therapy (IMRT)</td>
<td>2870</td>
<td>11.9</td>
<td>96.0</td>
</tr>
<tr>
<td>CT/simulation</td>
<td>2798</td>
<td>11.6</td>
<td>93.7</td>
</tr>
<tr>
<td>Conformal radiation therapy delivery</td>
<td>2708</td>
<td>11.2</td>
<td>90.7</td>
</tr>
<tr>
<td>Image-guided radiation therapy (IGRT)</td>
<td>2321</td>
<td>9.6</td>
<td>77.7</td>
</tr>
<tr>
<td>BID/TID vs. single treatment delivery</td>
<td>2094</td>
<td>8.7</td>
<td>70.1</td>
</tr>
<tr>
<td>High-dose rate brachytherapy</td>
<td>1903</td>
<td>7.9</td>
<td>63.7</td>
</tr>
<tr>
<td>Single-dose stereotactic radiation therapy</td>
<td>1477</td>
<td>6.1</td>
<td>49.5</td>
</tr>
<tr>
<td>Low-dose rate brachytherapy</td>
<td>1191</td>
<td>4.9</td>
<td>39.9</td>
</tr>
<tr>
<td>PET-CT</td>
<td>1127</td>
<td>4.7</td>
<td>37.7</td>
</tr>
<tr>
<td>Ultrasound localization</td>
<td>917</td>
<td>3.8</td>
<td>30.7</td>
</tr>
<tr>
<td>Gated delivery</td>
<td>903</td>
<td>3.7</td>
<td>30.2</td>
</tr>
<tr>
<td>Pediatric radiation therapy</td>
<td>793</td>
<td>3.3</td>
<td>26.6</td>
</tr>
<tr>
<td>Total skin/electron</td>
<td>722</td>
<td>3.0</td>
<td>24.2</td>
</tr>
<tr>
<td>Total body irradiation</td>
<td>687</td>
<td>2.8</td>
<td>23.0</td>
</tr>
<tr>
<td>PET</td>
<td>663</td>
<td>2.7</td>
<td>22.2</td>
</tr>
<tr>
<td>Volumetric modulated arc therapy (VMAT)</td>
<td>386</td>
<td>1.6</td>
<td>12.9</td>
</tr>
<tr>
<td>Intraoperative</td>
<td>302</td>
<td>1.2</td>
<td>10.1</td>
</tr>
<tr>
<td>Dynamic adaptive radiation therapy (DART)</td>
<td>128</td>
<td>0.5</td>
<td>4.3</td>
</tr>
<tr>
<td>Hyperthermia</td>
<td>124</td>
<td>0.5</td>
<td>4.2</td>
</tr>
<tr>
<td>Proton therapy</td>
<td>68</td>
<td>0.3</td>
<td>2.3</td>
</tr>
</tbody>
</table>

![Graph showing the percentage of facilities offering various services](chart.png)
In terms of staffing levels, how would you describe your facility?

<table>
<thead>
<tr>
<th></th>
<th>Radiation Therapist</th>
<th>Manager</th>
<th>Dosimetrist</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overstaffed=1</td>
<td>Count 70</td>
<td>10</td>
<td>27</td>
<td>107</td>
</tr>
<tr>
<td>%</td>
<td>3.3%</td>
<td>2.9%</td>
<td>5.0%</td>
<td>3.6%</td>
</tr>
<tr>
<td>Appropriately staffed=0</td>
<td>Count 1416</td>
<td>282</td>
<td>386</td>
<td>2084</td>
</tr>
<tr>
<td>%</td>
<td>67.2%</td>
<td>82.0%</td>
<td>71.2%</td>
<td>69.6%</td>
</tr>
<tr>
<td>Understaffed=-1</td>
<td>Count 612</td>
<td>52</td>
<td>126</td>
<td>790</td>
</tr>
<tr>
<td>%</td>
<td>29.0%</td>
<td>15.1%</td>
<td>23.2%</td>
<td>26.4%</td>
</tr>
<tr>
<td>Unknown</td>
<td>Count 10</td>
<td>0</td>
<td>3</td>
<td>13</td>
</tr>
<tr>
<td>%</td>
<td>0.5%</td>
<td>0.0%</td>
<td>0.6%</td>
<td>0.4%</td>
</tr>
<tr>
<td>Total</td>
<td>Count 2108</td>
<td>344</td>
<td>542</td>
<td>2994</td>
</tr>
<tr>
<td>%</td>
<td>100.0%</td>
<td>100.0%</td>
<td>100.0%</td>
<td>100.0%</td>
</tr>
<tr>
<td>Mean rating (1, 0, -1)</td>
<td>-0.26</td>
<td>-0.12</td>
<td>-0.18</td>
<td>-0.23</td>
</tr>
</tbody>
</table>

Significant differences among groups: T<M, D (P <.001, =.006)

In terms of staffing levels, how would you describe your facility?

---

![Bar chart showing staffing levels for Radiation Therapist, Manager, and Dosimetrist](chart.png)
If “understaffed,” choose the primary reason why you believe this is the case.

<table>
<thead>
<tr>
<th>Reason</th>
<th>Radiation Therapist</th>
<th>Manager</th>
<th>Dosimetrist</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>A budgeted full-time employee number that is too low for the department’s workload</td>
<td>Count: 300</td>
<td>23</td>
<td>54</td>
<td>377</td>
</tr>
<tr>
<td></td>
<td>% 47.2%</td>
<td>41.8%</td>
<td>41.2%</td>
<td>45.9%</td>
</tr>
<tr>
<td>Disagreement as to the appropriate staffing level for your department</td>
<td>Count: 231</td>
<td>23</td>
<td>48</td>
<td>302</td>
</tr>
<tr>
<td></td>
<td>% 36.3%</td>
<td>41.8%</td>
<td>36.6%</td>
<td>36.7%</td>
</tr>
<tr>
<td>Inability to fill budgeted positions</td>
<td>Count: 26</td>
<td>1</td>
<td>9</td>
<td>36</td>
</tr>
<tr>
<td></td>
<td>% 4.1%</td>
<td>1.8%</td>
<td>6.9%</td>
<td>4.4%</td>
</tr>
<tr>
<td>Other</td>
<td>Count: 79</td>
<td>8</td>
<td>20</td>
<td>107</td>
</tr>
<tr>
<td></td>
<td>% 12.4%</td>
<td>14.5%</td>
<td>15.3%</td>
<td>13.0%</td>
</tr>
<tr>
<td>Total</td>
<td>Count: 636</td>
<td>55</td>
<td>131</td>
<td>822</td>
</tr>
<tr>
<td></td>
<td>% 100.0%</td>
<td>100.0%</td>
<td>100.0%</td>
<td>100.0%</td>
</tr>
</tbody>
</table>

There were no statistically significant differences in the response patterns among the three groups.

If “understaffed,” choose the primary reason why you believe this is the case.

- A budgeted full-time employee number that is too low for the department’s workload
- Disagreement as to the appropriate staffing level for your department
- Inability to fill budgeted positions

![Bar chart showing response patterns among the three groups](chart.png)
### Mean patients treated per day and mean therapists per linear accelerator by staffing level

<table>
<thead>
<tr>
<th></th>
<th>Understaffed</th>
<th>Appropriately staffed</th>
<th>Overstaffed</th>
<th>Significance testing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Patients treated per day</td>
<td>68.7</td>
<td>55.9</td>
<td>49.8</td>
<td>U&gt;A &amp; O (P &lt; .001)</td>
</tr>
<tr>
<td>Therapists per linear accelerator</td>
<td>2.2</td>
<td>2.4</td>
<td>2.6</td>
<td>O&gt;A&gt;U (P &lt; .001)</td>
</tr>
</tbody>
</table>

#### Mean patients treated per day by staffing level

![Bar chart showing mean patients treated per day by staffing level](chart)

#### Mean therapists per linear accelerator by staffing level

![Bar chart showing mean therapists per linear accelerator by staffing level](chart)
### Do you perform treatments as a part of your professional duties?

<table>
<thead>
<tr>
<th></th>
<th>Radiation Therapist</th>
<th>Manager</th>
<th>Dosimetrist</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Yes</strong></td>
<td>Count</td>
<td>2034</td>
<td>198</td>
<td>139</td>
</tr>
<tr>
<td></td>
<td>%</td>
<td>96.8%</td>
<td>58.1%</td>
<td>25.8%</td>
</tr>
<tr>
<td><strong>No</strong></td>
<td>Count</td>
<td>67</td>
<td>143</td>
<td>399</td>
</tr>
<tr>
<td></td>
<td>%</td>
<td>3.2%</td>
<td>41.9%</td>
<td>74.2%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>Count</td>
<td>2101</td>
<td>341</td>
<td>538</td>
</tr>
<tr>
<td></td>
<td>%</td>
<td>100.0%</td>
<td>100.0%</td>
<td>100.0%</td>
</tr>
</tbody>
</table>

Significant differences among groups T>M>D (P <.001)

#### Do you perform treatments as a part of your professional duties?

![Bar chart showing the percentage of radiation therapists, managers, and dosimetrists who perform treatments as a part of their professional duties.](chart.png)
If you perform treatments as a part of your professional duties, for how many years?

<table>
<thead>
<tr>
<th>Years Range</th>
<th>Radiation Therapist</th>
<th>Manager</th>
<th>Dosimetrists</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 to 5 years</td>
<td>Count 557</td>
<td>10</td>
<td>15</td>
<td>582</td>
</tr>
<tr>
<td></td>
<td>% 30.0%</td>
<td>5.1%</td>
<td>11.7%</td>
<td>26.7%</td>
</tr>
<tr>
<td>6 to 10 years</td>
<td>Count 328</td>
<td>26</td>
<td>21</td>
<td>375</td>
</tr>
<tr>
<td></td>
<td>% 17.7%</td>
<td>13.2%</td>
<td>16.4%</td>
<td>17.2%</td>
</tr>
<tr>
<td>11 to 15 years</td>
<td>Count 249</td>
<td>28</td>
<td>25</td>
<td>302</td>
</tr>
<tr>
<td></td>
<td>% 13.4%</td>
<td>14.2%</td>
<td>19.5%</td>
<td>13.8%</td>
</tr>
<tr>
<td>16 to 20 years</td>
<td>Count 304</td>
<td>59</td>
<td>28</td>
<td>391</td>
</tr>
<tr>
<td></td>
<td>% 16.4%</td>
<td>29.9%</td>
<td>21.9%</td>
<td>17.9%</td>
</tr>
<tr>
<td>21 to 25 years</td>
<td>Count 175</td>
<td>36</td>
<td>19</td>
<td>230</td>
</tr>
<tr>
<td></td>
<td>% 9.4%</td>
<td>18.3%</td>
<td>14.8%</td>
<td>10.5%</td>
</tr>
<tr>
<td>26 years or more</td>
<td>Count 245</td>
<td>38</td>
<td>20</td>
<td>303</td>
</tr>
<tr>
<td></td>
<td>% 13.2%</td>
<td>19.3%</td>
<td>15.6%</td>
<td>13.9%</td>
</tr>
<tr>
<td>Total</td>
<td>Count 1858</td>
<td>197</td>
<td>128</td>
<td>2183</td>
</tr>
<tr>
<td></td>
<td>% 100.0%</td>
<td>100.0%</td>
<td>100.0%</td>
<td>100.0%</td>
</tr>
</tbody>
</table>

**Mean years**

<table>
<thead>
<tr>
<th>Radiation Therapist</th>
<th>Manager</th>
<th>Dosimetrists</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>13.33</td>
<td>18.72</td>
<td>16.59</td>
<td>14.01</td>
</tr>
</tbody>
</table>

Significant differences among groups M,D>T (P <.001)

If you perform treatments as a part of your professional duties, for how many years?

![Graph showing the distribution of years among Radiation Therapists, Managers, and Dosimetrists.](chart-url)
### Do you supervise those who perform treatments?

<table>
<thead>
<tr>
<th></th>
<th>Radiation Therapist</th>
<th>Dosimetrist</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Yes</strong></td>
<td>Count: 741</td>
<td>Count: 140</td>
<td>Count: 881</td>
</tr>
<tr>
<td></td>
<td>%: 35.6</td>
<td>%: 26.4</td>
<td>%: 33.7</td>
</tr>
<tr>
<td><strong>No</strong></td>
<td>Count: 1342</td>
<td>Count: 391</td>
<td>Count: 1733</td>
</tr>
<tr>
<td></td>
<td>%: 64.4</td>
<td>%: 73.6</td>
<td>%: 66.3</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>Count: 2083</td>
<td>Count: 531</td>
<td>Count: 2614</td>
</tr>
<tr>
<td></td>
<td>%: 100.0</td>
<td>%: 100.0</td>
<td>%: 100.0</td>
</tr>
</tbody>
</table>

Significant differences among groups: T>D (P <.001)

---

#### Do you supervise those who perform treatments?

![Bar Chart](chart.png)

- **Radiation Therapist**
- **Dosimetry**

---

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Radiation Therapy, Management and Dosimetry Workplace Survey 2010
### If you supervise those who perform treatments, for how many years?

<table>
<thead>
<tr>
<th></th>
<th>Radiation Therapist</th>
<th>Dosimetrist</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Count</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0 to 5 years</td>
<td>325</td>
<td>47</td>
<td>372</td>
</tr>
<tr>
<td>% 0 to 5 years</td>
<td>45.0%</td>
<td>34.6%</td>
<td>43.3%</td>
</tr>
<tr>
<td>6 to 10 years</td>
<td>183</td>
<td>38</td>
<td>221</td>
</tr>
<tr>
<td>% 6 to 10 years</td>
<td>25.3%</td>
<td>27.9%</td>
<td>25.7%</td>
</tr>
<tr>
<td>11 to 15 years</td>
<td>94</td>
<td>18</td>
<td>112</td>
</tr>
<tr>
<td>% 11 to 15 years</td>
<td>13.0%</td>
<td>13.2%</td>
<td>13.0%</td>
</tr>
<tr>
<td>16 to 20 years</td>
<td>59</td>
<td>14</td>
<td>73</td>
</tr>
<tr>
<td>% 16 to 20 years</td>
<td>8.2%</td>
<td>10.3%</td>
<td>8.5%</td>
</tr>
<tr>
<td>21 to 25 years</td>
<td>31</td>
<td>11</td>
<td>42</td>
</tr>
<tr>
<td>% 21 to 25 years</td>
<td>4.3%</td>
<td>8.1%</td>
<td>4.9%</td>
</tr>
<tr>
<td>26 years or more</td>
<td>31</td>
<td>8</td>
<td>39</td>
</tr>
<tr>
<td>% 26 years or more</td>
<td>4.3%</td>
<td>5.9%</td>
<td>4.5%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>723</strong></td>
<td><strong>136</strong></td>
<td><strong>859</strong></td>
</tr>
<tr>
<td>% <strong>Total</strong></td>
<td><strong>100.0%</strong></td>
<td><strong>100.0%</strong></td>
<td><strong>100.0%</strong></td>
</tr>
</tbody>
</table>

**Mean years**
- Radiation Therapist: 9.1
- Dosimetrist: 8.2
- Total: 9.4

*Significant differences among groups T>D (P = .003)*
### Approximately how many patients are treated daily at your facility?

<table>
<thead>
<tr>
<th>Frequency</th>
<th>Percent</th>
<th>Valid Percent</th>
<th>Cumulative Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 to 25</td>
<td>700</td>
<td>20.9</td>
<td>23.9</td>
</tr>
<tr>
<td>26 to 50</td>
<td>1096</td>
<td>32.7</td>
<td>37.4</td>
</tr>
<tr>
<td>51 to 75</td>
<td>525</td>
<td>15.6</td>
<td>17.9</td>
</tr>
<tr>
<td>76 to 100</td>
<td>311</td>
<td>9.3</td>
<td>10.6</td>
</tr>
<tr>
<td>101 or more</td>
<td>300</td>
<td>8.9</td>
<td>10.2</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>2932</strong></td>
<td><strong>87.4</strong></td>
<td><strong>100.0</strong></td>
</tr>
</tbody>
</table>

**Missing**

423

**Total**

3355

**Mean number of patients**

58.96 (SD=60.11)

5th=15.1, 25th=27.9, 50th=43.9, 75th=69.8, 95th=146.1

### Approximately how many patients are treated daily at your facility?

![Bar chart](chart.png)
### How many linear accelerators are used in your facility?

<table>
<thead>
<tr>
<th>Number of Accelerators</th>
<th>Frequency</th>
<th>Percent</th>
<th>Valid Percent</th>
<th>Cumulative Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 accelerator</td>
<td>1082</td>
<td>32.3</td>
<td>36.7</td>
<td>36.7</td>
</tr>
<tr>
<td>2 accelerators</td>
<td>1062</td>
<td>31.7</td>
<td>36</td>
<td>72.8</td>
</tr>
<tr>
<td>3 accelerators</td>
<td>394</td>
<td>11.7</td>
<td>13.4</td>
<td>86.1</td>
</tr>
<tr>
<td>4 accelerators</td>
<td>179</td>
<td>5.3</td>
<td>6.1</td>
<td>92.2</td>
</tr>
<tr>
<td>5 accelerators</td>
<td>89</td>
<td>2.7</td>
<td>3</td>
<td>95.2</td>
</tr>
<tr>
<td>6 accelerators or more</td>
<td>141</td>
<td>4.2</td>
<td>4.8</td>
<td>100.0</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>2947</strong></td>
<td><strong>87.8</strong></td>
<td><strong>100.0</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Missing</strong></td>
<td><strong>408</strong></td>
<td><strong>12.2</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>3355</strong></td>
<td><strong>100.0</strong></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Mean number of linear accelerators: **2.33 (SD=2.19)**

5th=undefined, 25th=1.2, 50th=1.9, 75th=2.8, 95th=5.6

### Patients treated per day by number of linear accelerators per facility

\[ y = 22.557x + 6.0976 \]

\[ R^2 = 0.74221 \]
### Patients treated per day per linear accelerator.

<table>
<thead>
<tr>
<th></th>
<th>Frequency</th>
<th>Percent</th>
<th>Valid Percent</th>
<th>Cumulative Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-10 patients</td>
<td>106</td>
<td>3.2</td>
<td>3.6</td>
<td>3.6</td>
</tr>
<tr>
<td>11-20 patients</td>
<td>914</td>
<td>27.2</td>
<td>31.4</td>
<td>35</td>
</tr>
<tr>
<td>21-30 patients</td>
<td>1270</td>
<td>37.9</td>
<td>43.6</td>
<td>78.6</td>
</tr>
<tr>
<td>31-40 patients</td>
<td>444</td>
<td>13.2</td>
<td>15.2</td>
<td>93.8</td>
</tr>
<tr>
<td>41-50 patients</td>
<td>128</td>
<td>3.8</td>
<td>4.4</td>
<td>98.2</td>
</tr>
<tr>
<td>51 patients or more</td>
<td>52</td>
<td>1.5</td>
<td>1.8</td>
<td>100.0</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>2914</strong></td>
<td><strong>86.9</strong></td>
<td><strong>100.0</strong></td>
<td></td>
</tr>
<tr>
<td>Missing</td>
<td>441</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>3355</strong></td>
<td><strong>100.0</strong></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Mean patients** 25.78 (SD=9.94)

**Percentiles** 5th=12.2, 25th=19.6, 50th=24.7, 75th=30.2, 95th=44.7
## On average, how many therapists per linear accelerator are routinely scheduled at your facility?

<table>
<thead>
<tr>
<th>Frequency</th>
<th>Percent</th>
<th>Valid Percent</th>
<th>Cumulative Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exactly 1 therapist</td>
<td>86</td>
<td>2.6</td>
<td>2.9</td>
</tr>
<tr>
<td>1.01 to 1.49 therapists</td>
<td>2</td>
<td>0.1</td>
<td>0.1</td>
</tr>
<tr>
<td>1.50 to 1.99 therapists</td>
<td>79</td>
<td>2.3</td>
<td>2.7</td>
</tr>
<tr>
<td>Exactly 2 therapists</td>
<td>1786</td>
<td>53.2</td>
<td>60.8</td>
</tr>
<tr>
<td>2.01 to 2.49 therapists</td>
<td>7</td>
<td>0.2</td>
<td>0.2</td>
</tr>
<tr>
<td>2.50 to 2.99 therapists</td>
<td>225</td>
<td>6.7</td>
<td>7.7</td>
</tr>
<tr>
<td>Exactly 3 therapists</td>
<td>543</td>
<td>16.2</td>
<td>18.5</td>
</tr>
<tr>
<td>Exactly 4 therapists</td>
<td>149</td>
<td>4.4</td>
<td>5.1</td>
</tr>
<tr>
<td>More than 4 therapists</td>
<td>61</td>
<td>1.8</td>
<td>2.1</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>2938</strong></td>
<td><strong>87.6</strong></td>
<td><strong>100.0</strong></td>
</tr>
<tr>
<td>Missing</td>
<td>417</td>
<td>12.4</td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>3355</strong></td>
<td><strong>100.0</strong></td>
<td></td>
</tr>
</tbody>
</table>

**Mean therapists**

2.32 (SD=.69)

5th=1.6, 25th=1.9, 50th=2.1, 75th=2.8, 95th=3.8

---

## On average, how many therapists per linear accelerator are routinely scheduled at your facility?

![Bar chart showing distribution of therapists per linear accelerator]
### On average, how many dosimetrists per linear accelerator are routinely scheduled at your facility?

<table>
<thead>
<tr>
<th></th>
<th>Frequency</th>
<th>Percent</th>
<th>Valid Percent</th>
<th>Cumulative Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 dosimetrists</td>
<td>206</td>
<td>6.1</td>
<td>7.2</td>
<td>7.2</td>
</tr>
<tr>
<td>1 dosimetrist</td>
<td>1749</td>
<td>52.1</td>
<td>61.2</td>
<td>68.4</td>
</tr>
<tr>
<td>2 dosimetrists</td>
<td>815</td>
<td>24.3</td>
<td>28.5</td>
<td>97.0</td>
</tr>
<tr>
<td>3 dosimetrists or more</td>
<td>87</td>
<td>2.6</td>
<td>3.0</td>
<td>100.0</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>2857</strong></td>
<td><strong>85.2</strong></td>
<td><strong>100.0</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Missing</strong></td>
<td><strong>498</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>3355</strong></td>
<td></td>
<td></td>
<td><strong>100.0</strong></td>
</tr>
</tbody>
</table>

**Mean dosimetrists** 1.24 (SD=.67)

Percentiles
- 5th=.01, 25th=.94, 50th=1.07, 75th=1.8, 95th=2.2

---

### On average, how many dosimetrists per linear accelerator are routinely scheduled at your facility?

- 0%
- 20%
- 40%
- 60%
- 80%

![Graph showing distribution of dosimetrists per linear accelerator](image-url)
How many, if any, hours per day does your facility routinely schedule one therapist per linear accelerator? (Rounded to the nearest hour.)

<table>
<thead>
<tr>
<th>Frequency</th>
<th>Percent</th>
<th>Valid Percent</th>
<th>Cumulative Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 hours</td>
<td>1652</td>
<td>49.2</td>
<td>58.9</td>
</tr>
<tr>
<td>1 hour</td>
<td>386</td>
<td>11.5</td>
<td>13.8</td>
</tr>
<tr>
<td>2 hours</td>
<td>206</td>
<td>6.1</td>
<td>7.3</td>
</tr>
<tr>
<td>3 hours</td>
<td>75</td>
<td>2.2</td>
<td>2.7</td>
</tr>
<tr>
<td>4 hours</td>
<td>69</td>
<td>2.1</td>
<td>2.5</td>
</tr>
<tr>
<td>5 hours</td>
<td>14</td>
<td>0.4</td>
<td>0.5</td>
</tr>
<tr>
<td>6 hours</td>
<td>10</td>
<td>0.3</td>
<td>0.4</td>
</tr>
<tr>
<td>7 hours</td>
<td>9</td>
<td>0.3</td>
<td>0.3</td>
</tr>
<tr>
<td>8 hours</td>
<td>285</td>
<td>8.5</td>
<td>10.2</td>
</tr>
<tr>
<td>Nine hours or more</td>
<td>100</td>
<td>3.0</td>
<td>3.6</td>
</tr>
<tr>
<td>Total</td>
<td>2806</td>
<td>83.6</td>
<td></td>
</tr>
<tr>
<td>Missing</td>
<td>549</td>
<td>16.4</td>
<td></td>
</tr>
<tr>
<td>Overall total</td>
<td>3355</td>
<td>100.0</td>
<td></td>
</tr>
</tbody>
</table>

Mean hours 1.73 (SD=3.20)  
Percentiles 5th=undefined, 25th=undefined, 50th=.14, 75th=1.79, 95th=8.4
How many dosimetrists are employed at your facility?

<table>
<thead>
<tr>
<th>Frequency</th>
<th>Percent</th>
<th>Valid Percent</th>
<th>Cumulative Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.50 to 0.74 dosimetrist</td>
<td>2</td>
<td>0.1</td>
<td>0.4</td>
</tr>
<tr>
<td>Exactly 1 dosimetrist</td>
<td>172</td>
<td>5.1</td>
<td>32.7</td>
</tr>
<tr>
<td>1.01 to 1.99 dosimetrists</td>
<td>16</td>
<td>0.4</td>
<td>3.1</td>
</tr>
<tr>
<td>Exactly 2 dosimetrists</td>
<td>142</td>
<td>4.2</td>
<td>27</td>
</tr>
<tr>
<td>2.01 to 2.99 dosimetrists</td>
<td>13</td>
<td>0.4</td>
<td>2.5</td>
</tr>
<tr>
<td>Exactly 3 dosimetrists</td>
<td>59</td>
<td>1.8</td>
<td>11.2</td>
</tr>
<tr>
<td>Exactly 4 dosimetrists</td>
<td>42</td>
<td>1.3</td>
<td>8</td>
</tr>
<tr>
<td>More than 4 dosimetrists</td>
<td>80</td>
<td>2.4</td>
<td>15.2</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>526</strong></td>
<td><strong>15.7</strong></td>
<td><strong>100.0</strong></td>
</tr>
<tr>
<td>Missing</td>
<td>2829</td>
<td>84.3</td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>3355</strong></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Mean dosimetrists 2.75 (SD=2.89)
Percentiles 5th=.64, 25th=1.2, 50th=2.0, 75th=3.3, 95th=7.3
### Do you have a physicist at your facility daily?

<table>
<thead>
<tr>
<th></th>
<th>Frequency</th>
<th>Percent</th>
<th>Valid Percent</th>
<th>Cumulative Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>2394</td>
<td>71.4</td>
<td>80.4</td>
<td>80.4</td>
</tr>
<tr>
<td>No</td>
<td>584</td>
<td>17.4</td>
<td>19.6</td>
<td>100.0</td>
</tr>
<tr>
<td>Total</td>
<td>2978</td>
<td>88.8</td>
<td>100.0</td>
<td></td>
</tr>
<tr>
<td>Missing</td>
<td>377</td>
<td>11.2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>3355</td>
<td>100.0</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Do you have a physicist at your facility daily?

- **Yes**: 71.4% (80.4% valid)
- **No**: 17.4% (19.6% valid)
- **Total**: 88.8% (100.0% valid)
- **Missing**: 11.2%
- **Total**: 100.0%
### Frequency Distribution of Full-Time Equivalent Physicists

<table>
<thead>
<tr>
<th>Frequency</th>
<th>Percent</th>
<th>Valid Percent</th>
<th>Cumulative Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 physicist</td>
<td>860</td>
<td>25.6</td>
<td>36.9</td>
</tr>
<tr>
<td>2 physicists</td>
<td>598</td>
<td>17.8</td>
<td>25.7</td>
</tr>
<tr>
<td>3 physicists</td>
<td>324</td>
<td>9.7</td>
<td>13.9</td>
</tr>
<tr>
<td>4 physicists</td>
<td>157</td>
<td>4.7</td>
<td>6.7</td>
</tr>
<tr>
<td>5 physicists</td>
<td>128</td>
<td>3.8</td>
<td>5.5</td>
</tr>
<tr>
<td>6 physicists or more</td>
<td>263</td>
<td>7.8</td>
<td>11.3</td>
</tr>
<tr>
<td>Total</td>
<td>2330</td>
<td>69.4</td>
<td>100.0</td>
</tr>
</tbody>
</table>

#### Missing Data

<table>
<thead>
<tr>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Missing</td>
<td>1025</td>
</tr>
<tr>
<td>Total</td>
<td>3355</td>
</tr>
</tbody>
</table>

#### Mean Physicists

Mean physicists: 2.96 (SD=3.85)

Percentiles: 5th=.83, 25th=1.1, 50th=2.0, 75th=3.1, 95th=8.1

### Patients Treated per Day by Number of Physicists Employed

![Graph showing the relationship between number of physicists and patients treated per day](Image)

\[ y = 10.524x + 34.38 \]
\[ R^2 = 0.46619 \]
If you selected “no” to the above question, how many hours per week do you have on-site physics support?

<table>
<thead>
<tr>
<th>Frequency</th>
<th>Percent</th>
<th>Valid Percent</th>
<th>Cumulative Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 hours</td>
<td>11</td>
<td>0.3</td>
<td>1.9</td>
</tr>
<tr>
<td>Less than 1 hour</td>
<td>3</td>
<td>0.1</td>
<td>0.5</td>
</tr>
<tr>
<td>1 hour</td>
<td>20</td>
<td>0.6</td>
<td>3.5</td>
</tr>
<tr>
<td>2 hours</td>
<td>34</td>
<td>1</td>
<td>5.9</td>
</tr>
<tr>
<td>3 hours</td>
<td>13</td>
<td>0.4</td>
<td>2.2</td>
</tr>
<tr>
<td>4 hours</td>
<td>40</td>
<td>1.2</td>
<td>6.9</td>
</tr>
<tr>
<td>5 hours</td>
<td>22</td>
<td>0.7</td>
<td>3.8</td>
</tr>
<tr>
<td>6 hours</td>
<td>20</td>
<td>0.6</td>
<td>3.5</td>
</tr>
<tr>
<td>7 hours</td>
<td>5</td>
<td>0.1</td>
<td>0.9</td>
</tr>
<tr>
<td>8 hours</td>
<td>105</td>
<td>3.1</td>
<td>18.1</td>
</tr>
<tr>
<td>9-16 hours</td>
<td>117</td>
<td>3.5</td>
<td>20.2</td>
</tr>
<tr>
<td>17-24 hours</td>
<td>109</td>
<td>3.2</td>
<td>18.8</td>
</tr>
<tr>
<td>25 to 32 hours</td>
<td>59</td>
<td>1.8</td>
<td>10.2</td>
</tr>
<tr>
<td>33 to 40 hours</td>
<td>19</td>
<td>0.6</td>
<td>3.3</td>
</tr>
<tr>
<td>41 hours or more</td>
<td>2</td>
<td>0.1</td>
<td>0.3</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>579</td>
<td>17.3</td>
<td>100.0</td>
</tr>
<tr>
<td><strong>Missing</strong></td>
<td>2776</td>
<td>82.7</td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>3355</td>
<td></td>
<td>100.0</td>
</tr>
</tbody>
</table>

**Mean hours**: 13.95 (SD=10.47)
**Percentiles**: 5th=1.2, 25th=5.7, 50th=10.9, 75th=21.9, 95th=32.4

If you selected “no” to the above question, how many hours per week do you have on-site physics support?
Patients treated per day by hours per week a physicist is on-site

\[ y = 0.4487x + 20.497 \]

\[ R^2 = 0.06841 \]

Patients treated per day by physicist on-site less than 8 hours per week

\[ y = 0.9624x + 19.546 \]

\[ R^2 = 0.01911 \]
## Clinical Skills

When provided the appropriate level of supervision, what percent of the procedures in your department could you perform?

<table>
<thead>
<tr>
<th>Percent Level</th>
<th>Radiation Therapist</th>
<th>Dosimetrist</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>10 to 19%</td>
<td>0.1</td>
<td>NA</td>
<td>0.1</td>
</tr>
<tr>
<td>20 to 29%</td>
<td>0.1</td>
<td>0.2</td>
<td>0.2</td>
</tr>
<tr>
<td>30 to 39%</td>
<td>NA</td>
<td>0.2</td>
<td>0.0</td>
</tr>
<tr>
<td>40 to 49%</td>
<td>0.1</td>
<td>NA</td>
<td>0.1</td>
</tr>
<tr>
<td>50 to 59%</td>
<td>0.7</td>
<td>1.0</td>
<td>0.7</td>
</tr>
<tr>
<td>60 to 69%</td>
<td>0.4</td>
<td>0.6</td>
<td>0.4</td>
</tr>
<tr>
<td>70 to 79%</td>
<td>3.7</td>
<td>4.2</td>
<td>3.8</td>
</tr>
<tr>
<td>80 to 89%</td>
<td>6.4</td>
<td>5.0</td>
<td>6.1</td>
</tr>
<tr>
<td>90 to 99%</td>
<td>17.6</td>
<td>24.9</td>
<td>19.0</td>
</tr>
<tr>
<td>100%</td>
<td>70.9</td>
<td>64.0</td>
<td>69.5</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>100.0</td>
<td>100.0</td>
<td>100.0</td>
</tr>
</tbody>
</table>

Mean Percent:  
- Radiation Therapist: 95.7% (SD=9.3%)  
- Dosimetrist: 95.1% (SD=9.8%)  
- Total: 95.6% (SD=9.4%)

There were no statistically significant differences between the percents between the two groups.

When provided the appropriate level of supervision, what percent of the procedures in your department could you perform?
If you indicated anything other than “100%” in the previous question, which procedures were you least prepared to perform? (Coded from verbatim responses.)

<table>
<thead>
<tr>
<th>Procedure</th>
<th>Frequency</th>
<th>Percent</th>
<th>Valid Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Simulations</td>
<td>323</td>
<td>9.6</td>
<td>50.4</td>
</tr>
<tr>
<td>HDR</td>
<td>115</td>
<td>3.4</td>
<td>17.9</td>
</tr>
<tr>
<td>Brachytherapy</td>
<td>101</td>
<td>3.0</td>
<td>15.8</td>
</tr>
<tr>
<td>Block cutting</td>
<td>40</td>
<td>1.2</td>
<td>6.2</td>
</tr>
<tr>
<td>Other</td>
<td>62</td>
<td>1.8</td>
<td>9.7</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>641</strong></td>
<td><strong>19.1</strong></td>
<td><strong>100.0</strong></td>
</tr>
<tr>
<td><strong>Missing</strong></td>
<td><strong>2714</strong></td>
<td><strong>80.9</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>3355</strong></td>
<td><strong>100.0</strong></td>
<td></td>
</tr>
</tbody>
</table>

If you indicated anything other than “100%” in the previous question, which procedures were you least prepared to perform? (Coded from verbatim responses.)
Questions for Managers on the Skills of Staff

When provided the appropriate level of supervision, what percent of the procedures in your department can new graduates perform?

<table>
<thead>
<tr>
<th>Frequency</th>
<th>Valid Percent</th>
<th>Cumulative Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 to 9%</td>
<td>2</td>
<td>0.6</td>
</tr>
<tr>
<td>10 to 19%</td>
<td>2</td>
<td>0.6</td>
</tr>
<tr>
<td>20 to 29%</td>
<td>4</td>
<td>1.2</td>
</tr>
<tr>
<td>30 to 39%</td>
<td>1</td>
<td>0.3</td>
</tr>
<tr>
<td>50 to 59%</td>
<td>19</td>
<td>5.8</td>
</tr>
<tr>
<td>60 to 69%</td>
<td>9</td>
<td>2.7</td>
</tr>
<tr>
<td>70 to 79%</td>
<td>50</td>
<td>15.2</td>
</tr>
<tr>
<td>80 to 89%</td>
<td>66</td>
<td>20</td>
</tr>
<tr>
<td>90 to 99%</td>
<td>51</td>
<td>15.5</td>
</tr>
<tr>
<td>100%</td>
<td>126</td>
<td>38.2</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>330</strong></td>
<td><strong>100.0</strong></td>
</tr>
</tbody>
</table>

Mean percent: 84.7% (SD=18.3%)
Percentiles: 5th=46.0, 25th=76.5, 50th=88.7, 75th=99.4, 95th=undefined

When provided the appropriate level of supervision, what percent of the procedures in your department can new graduates perform?

![Bar chart showing the distribution of percentages of procedures new graduates can perform].
In your opinion, the lack of skills with new graduates you hire is due primarily to:

<table>
<thead>
<tr>
<th></th>
<th>Frequency</th>
<th>Percent</th>
<th>Valid Percent</th>
<th>Cumulative Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Their individual characteristics</td>
<td>44</td>
<td>1.3</td>
<td>12.9</td>
<td>12.9</td>
</tr>
<tr>
<td>Their educational program</td>
<td>52</td>
<td>1.5</td>
<td>15.3</td>
<td>28.2</td>
</tr>
<tr>
<td>Both above equally</td>
<td>97</td>
<td>2.9</td>
<td>28.5</td>
<td>56.8</td>
</tr>
<tr>
<td>N/A; I am fully satisfied with new graduates' skills</td>
<td>80</td>
<td>2.4</td>
<td>23.5</td>
<td>80.3</td>
</tr>
<tr>
<td>Other</td>
<td>67</td>
<td>2.0</td>
<td>19.7</td>
<td>100.0</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>340</strong></td>
<td><strong>10.1</strong></td>
<td><strong>100.0</strong></td>
<td></td>
</tr>
</tbody>
</table>

Missing: 3015 (89.9%)
Total: 3355 (100.0%)

In your opinion, the lack of skills with new graduates you hire is due primarily to:

- Their individual characteristics: 12.9%
- Their educational program: 28.2%
- Both above equally: 56.8%
- N/A; I am fully satisfied with new graduates' skills: 80.3%
- Other: 100.0%

Do you believe there is a difference in skills of students graduating from different types of programs?

<table>
<thead>
<tr>
<th></th>
<th>Frequency</th>
<th>Percent</th>
<th>Valid Percent</th>
<th>Cumulative Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>223</td>
<td>6.6</td>
<td>66.4</td>
<td>66.4</td>
</tr>
<tr>
<td>No</td>
<td>113</td>
<td>3.4</td>
<td>33.6</td>
<td>100.0</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>336</strong></td>
<td><strong>10.0</strong></td>
<td><strong>100.0</strong></td>
<td></td>
</tr>
</tbody>
</table>

Missing: 3019 (90.0%)
Total: 3355 (100.0%)

Do you believe there is a difference in skills of students graduating from different types of programs?

- Yes: 66.4%
- No: 33.6%
In your experience, compared to therapists with three or five years of experience, new graduates are:

<table>
<thead>
<tr>
<th>Rating</th>
<th>Frequency</th>
<th>Percent</th>
<th>Valid Percent</th>
<th>Cumulative Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Much better=2</td>
<td>0</td>
<td>0.0</td>
<td>0.0</td>
<td>0.0</td>
</tr>
<tr>
<td>Better=1</td>
<td>12</td>
<td>0.4</td>
<td>3.6</td>
<td>3.6</td>
</tr>
<tr>
<td>About the same=0</td>
<td>102</td>
<td>3.0</td>
<td>30.2</td>
<td>33.7</td>
</tr>
<tr>
<td>Worse=-1</td>
<td>204</td>
<td>6.1</td>
<td>60.4</td>
<td>94.1</td>
</tr>
<tr>
<td>Much worse=-2</td>
<td>20</td>
<td>0.6</td>
<td>5.9</td>
<td>100.0</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>338</strong></td>
<td><strong>10.1</strong></td>
<td><strong>100.0</strong></td>
<td></td>
</tr>
</tbody>
</table>

Missing 3017 89.9

**Total 3355 100.0**

**Mean (Rating=2,1,0,-1,-2) -0.69 (SD=.64)**

In your experience, compared to therapists with three or five years of experience, new graduates are:

![Bar chart showing percentages of responses](chart.png)
Daily Practices

Does your facility’s policy require that IMRT/VMAT have plan-specific quality assurance (QA) procedures performed prior to the first day of treatment?

<table>
<thead>
<tr>
<th></th>
<th>Frequency</th>
<th>Percent</th>
<th>Valid Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>2511</td>
<td>74.8</td>
<td>97.3</td>
</tr>
<tr>
<td>No</td>
<td>71</td>
<td>2.1</td>
<td>2.7</td>
</tr>
<tr>
<td>Total</td>
<td>2582</td>
<td>77.0</td>
<td>100.0</td>
</tr>
<tr>
<td>Do not use these techniques</td>
<td>62</td>
<td>1.8</td>
<td></td>
</tr>
<tr>
<td>Missing</td>
<td>711</td>
<td>21.2</td>
<td></td>
</tr>
<tr>
<td>Total missing</td>
<td>773</td>
<td>23.0</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>3355</td>
<td>100.0</td>
<td></td>
</tr>
</tbody>
</table>

If you selected “yes” on the previous question, who performs this second check?

<table>
<thead>
<tr>
<th></th>
<th>N</th>
<th>Percent</th>
<th>Percent of Respondents</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physicist</td>
<td>491</td>
<td>87.7</td>
<td>94.8</td>
</tr>
<tr>
<td>Dosimetrist</td>
<td>55</td>
<td>9.8</td>
<td>10.6</td>
</tr>
<tr>
<td>Other</td>
<td>14</td>
<td>2.5</td>
<td>2.7</td>
</tr>
<tr>
<td>Total</td>
<td>560</td>
<td>100.0</td>
<td>108.1</td>
</tr>
</tbody>
</table>

If you selected “yes” on the previous question, who performs this second check?
### Does your facility use remote planning services?

<table>
<thead>
<tr>
<th></th>
<th>Frequency</th>
<th>Percent</th>
<th>Valid Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>86</td>
<td>2.5</td>
<td>15.9</td>
</tr>
<tr>
<td>No</td>
<td>454</td>
<td>13.4</td>
<td>84.1</td>
</tr>
<tr>
<td>Total</td>
<td>540</td>
<td>15.9</td>
<td>100.0</td>
</tr>
<tr>
<td>Missing</td>
<td>2855</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>3395</td>
<td></td>
<td>100.0</td>
</tr>
</tbody>
</table>

### What method of patient verification does your facility employ?

<table>
<thead>
<tr>
<th>Method</th>
<th>Frequency</th>
<th>Percent of Respondents</th>
</tr>
</thead>
<tbody>
<tr>
<td>Photo verification</td>
<td>2025</td>
<td>60.4</td>
</tr>
<tr>
<td>Verbal confirmation</td>
<td>1858</td>
<td>55.4</td>
</tr>
<tr>
<td>Wrist band/I.D. card</td>
<td>763</td>
<td>22.7</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>4646</strong></td>
<td><strong>138.5</strong></td>
</tr>
</tbody>
</table>

---

[Graph showing the distribution of yes and no responses to the remote planning services question.]

[Graph showing the distribution of response methods for patient verification.]
Does your facility’s policy require that another person perform a second check on 2-D and 3-D treatment plans before the first day of treatment?

<table>
<thead>
<tr>
<th>Frequency</th>
<th>Percent</th>
<th>Valid Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>455</td>
<td>13.6</td>
</tr>
<tr>
<td>No</td>
<td>85</td>
<td>2.5</td>
</tr>
<tr>
<td>Total</td>
<td>540</td>
<td>16.1</td>
</tr>
<tr>
<td>Do not use these techniques</td>
<td>4</td>
<td>0.1</td>
</tr>
<tr>
<td>Missing</td>
<td>2811</td>
<td>83.8</td>
</tr>
<tr>
<td>Total missing</td>
<td>2815</td>
<td>83.9</td>
</tr>
<tr>
<td>Total</td>
<td>3355</td>
<td>100.0</td>
</tr>
</tbody>
</table>

If you selected “yes” that your facility’s policy requires that another person perform a second check on 2-D and 3-D treatment plans before the first day of treatment, who performs this second check?

<table>
<thead>
<tr>
<th>Frequency</th>
<th>Percent of Respondents who use 2-D/3-D</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physicist</td>
<td>410</td>
</tr>
<tr>
<td>Dosimetrist</td>
<td>85</td>
</tr>
<tr>
<td>Other</td>
<td>30</td>
</tr>
<tr>
<td>Total</td>
<td>525</td>
</tr>
</tbody>
</table>

If you selected “yes” that your facility’s policy requires that another person perform a second check on 2-D and 3-D treatment plans before the first day of treatment, who performs this second check?
What treatment imaging protocols does your facility use?

<table>
<thead>
<tr>
<th>Protocol</th>
<th>Frequency</th>
<th>Percent of Respondents</th>
</tr>
</thead>
<tbody>
<tr>
<td>All fields before or on day one</td>
<td>1755</td>
<td>52.3</td>
</tr>
<tr>
<td>Weekly MV imaging</td>
<td>1487</td>
<td>44.3</td>
</tr>
<tr>
<td>Cone-beam CT (CBCT)</td>
<td>1093</td>
<td>32.6</td>
</tr>
<tr>
<td>Daily orthogonal pair imaging</td>
<td>900</td>
<td>26.8</td>
</tr>
<tr>
<td>IMRT CIAO images before day one</td>
<td>651</td>
<td>19.4</td>
</tr>
<tr>
<td>Daily ultrasound imaging</td>
<td>346</td>
<td>10.3</td>
</tr>
<tr>
<td>None of the above</td>
<td>7</td>
<td>0.2</td>
</tr>
<tr>
<td>Other</td>
<td>176</td>
<td>5.2</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>6415</strong></td>
<td><strong>191.2</strong></td>
</tr>
</tbody>
</table>

What treatment imaging protocols does your facility use?
When does your facility require that all planned treatment parameters be *manually* verified by the treating therapist at the treatment machine?

<table>
<thead>
<tr>
<th></th>
<th>Frequency</th>
<th>Percent</th>
<th>Percent of Respondents</th>
</tr>
</thead>
<tbody>
<tr>
<td>On first day of treatment</td>
<td>1675</td>
<td>41.9</td>
<td>80.1</td>
</tr>
<tr>
<td>Following any plan modifications</td>
<td>1169</td>
<td>29.3</td>
<td>55.9</td>
</tr>
<tr>
<td>Daily before treating</td>
<td>668</td>
<td>16.7</td>
<td>31.9</td>
</tr>
<tr>
<td>Weekly</td>
<td>268</td>
<td>6.7</td>
<td>12.8</td>
</tr>
<tr>
<td>Never</td>
<td>71</td>
<td>1.8</td>
<td>3.4</td>
</tr>
<tr>
<td>Other</td>
<td>142</td>
<td>3.6</td>
<td>6.8</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>3993</strong></td>
<td><strong>100.0</strong></td>
<td><strong>190.9</strong></td>
</tr>
</tbody>
</table>

When does your facility require that all planned treatment parameters be *manually* verified by the treating therapist at the treatment machine?
### What is the primary distraction in your clinical setting? (Coded from verbatim responses.)

<table>
<thead>
<tr>
<th></th>
<th>Radiation Therapist</th>
<th>Manager</th>
<th>Dosimetrist</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Patient/work load</td>
<td>Count 180</td>
<td>39</td>
<td>63</td>
<td>282</td>
</tr>
<tr>
<td></td>
<td>% 15.7%</td>
<td>20.7%</td>
<td>24.4%</td>
<td>17.7%</td>
</tr>
<tr>
<td>Other people interrupting (nurses, therapists, Drs.)</td>
<td>Count 326</td>
<td>31</td>
<td>48</td>
<td>405</td>
</tr>
<tr>
<td></td>
<td>% 28.4%</td>
<td>16.5%</td>
<td>18.6%</td>
<td>25.4%</td>
</tr>
<tr>
<td>Phone calls/internet/e-mail</td>
<td>Count 153</td>
<td>18</td>
<td>22</td>
<td>193</td>
</tr>
<tr>
<td></td>
<td>% 13.3%</td>
<td>9.6%</td>
<td>8.5%</td>
<td>12.1%</td>
</tr>
<tr>
<td>Paperwork</td>
<td>Count 48</td>
<td>9</td>
<td>10</td>
<td>67</td>
</tr>
<tr>
<td></td>
<td>% 4.2%</td>
<td>4.8%</td>
<td>3.9%</td>
<td>4.2%</td>
</tr>
<tr>
<td>Old technology/equipment going down</td>
<td>Count 77</td>
<td>12</td>
<td>16</td>
<td>105</td>
</tr>
<tr>
<td></td>
<td>% 6.7%</td>
<td>6.4%</td>
<td>6.2%</td>
<td>6.6%</td>
</tr>
<tr>
<td>Department politics</td>
<td>Count 180</td>
<td>30</td>
<td>49</td>
<td>259</td>
</tr>
<tr>
<td></td>
<td>% 15.7%</td>
<td>16.0%</td>
<td>19.0%</td>
<td>16.2%</td>
</tr>
<tr>
<td>Noise</td>
<td>Count 56</td>
<td>9</td>
<td>16</td>
<td>81</td>
</tr>
<tr>
<td></td>
<td>% 4.9%</td>
<td>4.8%</td>
<td>6.2%</td>
<td>5.1%</td>
</tr>
<tr>
<td>Other</td>
<td>Count 129</td>
<td>40</td>
<td>34</td>
<td>203</td>
</tr>
<tr>
<td></td>
<td>% 11.2%</td>
<td>21.3%</td>
<td>13.2%</td>
<td>12.7%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>Count 1149</strong></td>
<td><strong>188</strong></td>
<td><strong>258</strong></td>
<td><strong>1595</strong></td>
</tr>
<tr>
<td></td>
<td>% 100.0%</td>
<td>100.0%</td>
<td>100.0%</td>
<td>100.0%</td>
</tr>
</tbody>
</table>

### What is the primary distraction in your clinical setting? (Coded from verbatim responses.)

![Chart showing percentages of primary distractions by role](chart.png)
### Does your department track errors in the clinical setting?

<table>
<thead>
<tr>
<th></th>
<th>Frequency</th>
<th>Percent</th>
<th>Valid Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>2530</td>
<td>75.4</td>
<td>86.2</td>
</tr>
<tr>
<td>No</td>
<td>404</td>
<td>12.0</td>
<td>13.8</td>
</tr>
<tr>
<td>Total</td>
<td>2934</td>
<td>87.4</td>
<td>100.0</td>
</tr>
<tr>
<td>Missing</td>
<td>421</td>
<td>12.5</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>3355</td>
<td>100.0</td>
<td></td>
</tr>
</tbody>
</table>

![Bar chart showing the distribution of responses to the question: Does your department track errors in the clinical setting?](chart)
## Technological Impacts

How have technological developments over the past five years affected the number of patients you and your coworkers can treat in a given week?

<table>
<thead>
<tr>
<th>Impact Description</th>
<th>Radiation Therapist</th>
<th>Manager</th>
<th>Dosimetrist</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Greatly increased the number of patients treated =2</td>
<td>Count: 409</td>
<td>32</td>
<td>64</td>
<td>505</td>
</tr>
<tr>
<td>%</td>
<td>19.6%</td>
<td>9.4%</td>
<td>11.8%</td>
<td>17.0%</td>
</tr>
<tr>
<td>Somewhat increased number of patients treated =1</td>
<td>Count: 704</td>
<td>79</td>
<td>155</td>
<td>938</td>
</tr>
<tr>
<td>%</td>
<td>33.8%</td>
<td>23.2%</td>
<td>28.7%</td>
<td>31.6%</td>
</tr>
<tr>
<td>Had very little effect on the number of patients treated=0</td>
<td>Count: 623</td>
<td>137</td>
<td>231</td>
<td>991</td>
</tr>
<tr>
<td>%</td>
<td>29.9%</td>
<td>40.3%</td>
<td>42.7%</td>
<td>33.4%</td>
</tr>
<tr>
<td>Somewhat decreased number of patients treated =-1</td>
<td>Count: 318</td>
<td>85</td>
<td>89</td>
<td>492</td>
</tr>
<tr>
<td>%</td>
<td>15.3%</td>
<td>25.0%</td>
<td>16.5%</td>
<td>16.6%</td>
</tr>
<tr>
<td>Greatly decreased number of patients treated =-2</td>
<td>Count: 29</td>
<td>7</td>
<td>2</td>
<td>38</td>
</tr>
<tr>
<td>%</td>
<td>1.4%</td>
<td>2.1%</td>
<td>0.4%</td>
<td>1.3%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>Count: 2083</strong></td>
<td><strong>340</strong></td>
<td><strong>541</strong></td>
<td><strong>2964</strong></td>
</tr>
<tr>
<td>%</td>
<td>100.0%</td>
<td>100.0%</td>
<td>100.0%</td>
<td>100.0%</td>
</tr>
<tr>
<td><strong>Mean rating (2,1,0,-1,-2)</strong></td>
<td>0.55</td>
<td>0.13</td>
<td>0.35</td>
<td>0.47</td>
</tr>
</tbody>
</table>

Significant differences among groups: T>D>M (P <.001, =.004)

---

How have technological developments over the past five years affected the number of patients you and your coworkers can treat in a given week?

[Bar chart showing percentages for each category: Greatly increased, Somewhat increased, Had very little effect, Somewhat decreased, Greatly decreased for Radiation Therapist, Manager, Dosimetrist, and Total.]
How have technological developments over the past five years affected the quality of care you are able to deliver to patients?

<table>
<thead>
<tr>
<th>Response Level</th>
<th>Radiation Therapist</th>
<th>Manager</th>
<th>Dosimetrist</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Greatly increased quality of care = 2</td>
<td>Count: 1150</td>
<td>%: 55.1%</td>
<td>195</td>
<td>%: 57.0%</td>
</tr>
<tr>
<td>Somewhat increased quality of care = 1</td>
<td>Count: 684</td>
<td>%: 32.8%</td>
<td>103</td>
<td>%: 30.1%</td>
</tr>
<tr>
<td>Had very little effect on quality of care = 0</td>
<td>Count: 187</td>
<td>%: 9.0%</td>
<td>35</td>
<td>%: 10.2%</td>
</tr>
<tr>
<td>Somewhat decreased quality of care = -1</td>
<td>Count: 59</td>
<td>%: 2.8%</td>
<td>8</td>
<td>%: 2.3%</td>
</tr>
<tr>
<td>Greatly decreased quality of care = -2</td>
<td>Count: 8</td>
<td>%: 0.4%</td>
<td>1</td>
<td>%: 0.3%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>Count</strong>: 2088</td>
<td><strong>%</strong>: 100.0%</td>
<td>342</td>
<td><strong>%</strong>: 100.0%</td>
</tr>
<tr>
<td><strong>Mean rating (2,1,0,-1,-2)</strong></td>
<td>1.39</td>
<td>1.41</td>
<td>1.48</td>
<td>1.41</td>
</tr>
</tbody>
</table>

There were no statistically significant differences in the response patterns among the three groups.

How have technological developments over the past five years affected the quality of care you are able to deliver to patients?
What other effects have technological developments had on your department over the past few years?
(Coded from verbatim responses.)

<table>
<thead>
<tr>
<th>Effect</th>
<th>Radiation Therapist</th>
<th>Manager</th>
<th>Dosimetrist</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Increase in accuracy</strong></td>
<td>Count 84</td>
<td>26</td>
<td>23</td>
<td>133</td>
</tr>
<tr>
<td></td>
<td>% 21.6%</td>
<td>23.4%</td>
<td>18.5%</td>
<td>21.3%</td>
</tr>
<tr>
<td><strong>Better treatment</strong></td>
<td>Count 62</td>
<td>9</td>
<td>18</td>
<td>89</td>
</tr>
<tr>
<td></td>
<td>% 16.0%</td>
<td>8.1%</td>
<td>14.5%</td>
<td>14.3%</td>
</tr>
<tr>
<td><strong>Increase in complexity and time of their job</strong></td>
<td>Count 89</td>
<td>25</td>
<td>29</td>
<td>143</td>
</tr>
<tr>
<td></td>
<td>% 22.9%</td>
<td>22.5%</td>
<td>23.4%</td>
<td>23.0%</td>
</tr>
<tr>
<td><strong>Added stress</strong></td>
<td>Count 67</td>
<td>20</td>
<td>20</td>
<td>107</td>
</tr>
<tr>
<td></td>
<td>% 17.3%</td>
<td>18.0%</td>
<td>16.1%</td>
<td>17.2%</td>
</tr>
<tr>
<td><strong>Other</strong></td>
<td>Count 86</td>
<td>31</td>
<td>34</td>
<td>150</td>
</tr>
<tr>
<td></td>
<td>% 21.9%</td>
<td>27.9%</td>
<td>27.4%</td>
<td>24.1%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>Count 388</td>
<td>111</td>
<td>124</td>
<td>623</td>
</tr>
<tr>
<td></td>
<td>% 100.0%</td>
<td>100.0%</td>
<td>100.0%</td>
<td>100.0%</td>
</tr>
</tbody>
</table>

What other effects have technological developments had on your department over the past few years?
(Coded from verbatim responses.)

![Bar chart showing percentages of responses](image-url)
How would you rate your eagerness, as well as your ability, to adapt to and make use of technological developments in your practice?

<table>
<thead>
<tr>
<th>Response</th>
<th>Radiation Therapist</th>
<th>Manager</th>
<th>Dosimetrist</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>I find it very difficult to get “up to speed” in the use of new technology=-2</td>
<td>Count 15</td>
<td>6</td>
<td>4</td>
<td>25</td>
</tr>
<tr>
<td>%</td>
<td>0.7%</td>
<td>1.7%</td>
<td>0.7%</td>
<td>0.8%</td>
</tr>
<tr>
<td>Although I find learning to use new technology difficult, I’m willing and able to do so=-1</td>
<td>Count 202</td>
<td>24</td>
<td>49</td>
<td>275</td>
</tr>
<tr>
<td>%</td>
<td>9.6%</td>
<td>7.0%</td>
<td>9.0%</td>
<td>9.2%</td>
</tr>
<tr>
<td>I find that the time it takes me to learn to use new technology well is minimal, given the potential benefits=1</td>
<td>Count 761</td>
<td>117</td>
<td>195</td>
<td>1073</td>
</tr>
<tr>
<td>%</td>
<td>36.3%</td>
<td>34.0%</td>
<td>35.9%</td>
<td>36.0%</td>
</tr>
<tr>
<td>I’m early to seek out new technology and quickly get “up to speed.”=2</td>
<td>Count 1078</td>
<td>178</td>
<td>280</td>
<td>1536</td>
</tr>
<tr>
<td>%</td>
<td>51.4%</td>
<td>51.7%</td>
<td>51.6%</td>
<td>51.5%</td>
</tr>
<tr>
<td>Other</td>
<td>Count 40</td>
<td>19</td>
<td>15</td>
<td>74</td>
</tr>
<tr>
<td>%</td>
<td>1.9%</td>
<td>5.5%</td>
<td>2.8%</td>
<td>2.5%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>Count 2096</strong></td>
<td><strong>344</strong></td>
<td><strong>543</strong></td>
<td><strong>2983</strong></td>
</tr>
<tr>
<td>%</td>
<td>100.0%</td>
<td>100.0%</td>
<td>100.0%</td>
<td>100.0%</td>
</tr>
</tbody>
</table>

**Mean rating (2,1,-1,-2)** 1.41 1.44 1.42 1.42

There were no statistically significant differences in the response patterns among the three groups.

How would you rate your eagerness, as well as your ability, to adapt to and make use of technological developments in your practice?
**When implementing new technology do you feel that you are adequately prepared to begin using the technology?**

<table>
<thead>
<tr>
<th></th>
<th>Radiation Therapist</th>
<th>Manager</th>
<th>Dosimetrist</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Yes</strong></td>
<td>Count</td>
<td>1786</td>
<td>301</td>
<td>442</td>
</tr>
<tr>
<td></td>
<td>%</td>
<td>85.7%</td>
<td>88.0%</td>
<td>81.3%</td>
</tr>
<tr>
<td><strong>No</strong></td>
<td>Count</td>
<td>299</td>
<td>41</td>
<td>102</td>
</tr>
<tr>
<td></td>
<td>%</td>
<td>14.3%</td>
<td>12.0%</td>
<td>18.8%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>Count</td>
<td>2085</td>
<td>342</td>
<td>544</td>
</tr>
<tr>
<td></td>
<td>%</td>
<td>100.0%</td>
<td>100.0%</td>
<td>100.0%</td>
</tr>
</tbody>
</table>

Significant differences among groups M, T>D (P =.018, .030)

---

**When implementing new technology do you feel that you are adequately prepared to begin using the technology?**

![Bar chart showing preparedness levels for Radiation Therapist, Manager, and Dosimetrist.](chart.png)
### How intuitive is the equipment you work with?

<table>
<thead>
<tr>
<th></th>
<th>Radiation Therapist</th>
<th>Manager</th>
<th>Dosimetrist</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Very intuitive=2</td>
<td>Count: 671</td>
<td>78</td>
<td>142</td>
<td>891</td>
</tr>
<tr>
<td></td>
<td>% 32.4%</td>
<td>22.9%</td>
<td>26.2%</td>
<td>30.2%</td>
</tr>
<tr>
<td>Somewhat intuitive=1</td>
<td>Count: 921</td>
<td>185</td>
<td>266</td>
<td>1372</td>
</tr>
<tr>
<td></td>
<td>% 44.5%</td>
<td>54.4%</td>
<td>49.1%</td>
<td>46.5%</td>
</tr>
<tr>
<td>Neutral=0</td>
<td>Count: 397</td>
<td>59</td>
<td>111</td>
<td>567</td>
</tr>
<tr>
<td></td>
<td>% 19.2%</td>
<td>17.4%</td>
<td>20.5%</td>
<td>19.2%</td>
</tr>
<tr>
<td>Somewhat non-intuitive=-1</td>
<td>Count: 54</td>
<td>12</td>
<td>19</td>
<td>85</td>
</tr>
<tr>
<td></td>
<td>% 2.6%</td>
<td>3.5%</td>
<td>3.5%</td>
<td>2.9%</td>
</tr>
<tr>
<td>Not at all intuitive=-2</td>
<td>Count: 28</td>
<td>6</td>
<td>4</td>
<td>38</td>
</tr>
<tr>
<td></td>
<td>% 1.4%</td>
<td>1.8%</td>
<td>0.7%</td>
<td>1.3%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>Count: 2071</strong></td>
<td><strong>340</strong></td>
<td><strong>542</strong></td>
<td><strong>2953</strong></td>
</tr>
<tr>
<td></td>
<td>% 100.0%</td>
<td>100.0%</td>
<td>100.0%</td>
<td>100.0%</td>
</tr>
<tr>
<td><strong>Mean rating</strong> (2,1,0,-1,-2)</td>
<td><strong>1.04</strong></td>
<td><strong>.93</strong></td>
<td><strong>.96</strong></td>
<td><strong>1.01</strong></td>
</tr>
</tbody>
</table>

There were no statistically significant differences in the response patterns among the three groups.

![Chart showing distribution of responses for different groups](chart.png)

- **Radiation Therapist**
- **Manager**
- **Dosimetrist**
What are the key factors that would help you adopt new clinical capabilities at your center?

<table>
<thead>
<tr>
<th>Factor</th>
<th>Radiation Therapist</th>
<th>Manager</th>
<th>Dosimetrist</th>
</tr>
</thead>
<tbody>
<tr>
<td>New clinical information</td>
<td>Count: 970, % 47.1%</td>
<td>181, 53.4%</td>
<td>225, 41.8%</td>
</tr>
<tr>
<td>Lighter patient load</td>
<td>Count: 287, % 13.9%</td>
<td>17, 5.0%</td>
<td>41, 7.6%</td>
</tr>
<tr>
<td>Reimbursement</td>
<td>Count: 678, % 32.9%</td>
<td>195, 57.5%</td>
<td>189, 35.1%</td>
</tr>
<tr>
<td>Own clinical knowledge</td>
<td>Count: 506, % 24.6%</td>
<td>84, 24.8%</td>
<td>131, 24.3%</td>
</tr>
<tr>
<td>Increased funds allocated for training purposes</td>
<td>Count: 904, % 43.9%</td>
<td>119, 35.1%</td>
<td>233, 43.3%</td>
</tr>
<tr>
<td>Experienced personnel</td>
<td>Count: 676, % 32.8%</td>
<td>121, 35.7%</td>
<td>185, 34.4%</td>
</tr>
<tr>
<td>Product training</td>
<td>Count: 1264, % 61.4%</td>
<td>170, 50.1%</td>
<td>324, 60.2%</td>
</tr>
<tr>
<td>Clinical training</td>
<td>Count: 1231, % 59.8%</td>
<td>173, 51.0%</td>
<td>300, 55.8%</td>
</tr>
<tr>
<td>Other</td>
<td>Count: 68, % 3.3%</td>
<td>25, 7.4%</td>
<td>36, 6.7%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>Count</strong>: 2060, 339, 538</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

What are the key factors that would help you adopt new clinical capabilities at your center?

![Bar chart showing the percentage of Radiation Therapist, Manager, and Dosimetrist for each factor.](chart.png)
Are there areas in your discipline that have become so unique and specialized that they warrant special recognition through certification?

<table>
<thead>
<tr>
<th></th>
<th>Radiation Therapist</th>
<th>Manager</th>
<th>Dosimetrist</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Yes</strong></td>
<td>Count</td>
<td>278</td>
<td>78</td>
<td>54</td>
</tr>
<tr>
<td></td>
<td>%</td>
<td>13.9%</td>
<td>23.5%</td>
<td>10.3%</td>
</tr>
<tr>
<td><strong>No</strong></td>
<td>Count</td>
<td>1729</td>
<td>254</td>
<td>472</td>
</tr>
<tr>
<td></td>
<td>%</td>
<td>86.1%</td>
<td>76.5%</td>
<td>89.7%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>Count</td>
<td>2007</td>
<td>332</td>
<td>526</td>
</tr>
<tr>
<td></td>
<td>%</td>
<td>100.0%</td>
<td>100.0%</td>
<td>100.0%</td>
</tr>
</tbody>
</table>

Significant differences among groups M>T,D (P<.001)
If you selected “yes” on the previous question, what are the areas that should be separately certified?  
(Coded from verbatim responses.)

<table>
<thead>
<tr>
<th></th>
<th>Radiation Therapist</th>
<th>Manager</th>
<th>Dosimetrist</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Brachytherapy</td>
<td>Count: 12</td>
<td>6</td>
<td>7</td>
<td>25</td>
</tr>
<tr>
<td>%</td>
<td>4.8%</td>
<td>7.5%</td>
<td>14.6%</td>
<td>6.6%</td>
</tr>
<tr>
<td>CT simulation</td>
<td>Count: 96</td>
<td>26</td>
<td>4</td>
<td>126</td>
</tr>
<tr>
<td>%</td>
<td>38.1%</td>
<td>32.6%</td>
<td>8.4%</td>
<td>33.2%</td>
</tr>
<tr>
<td>Cyberknife</td>
<td>Count: 38</td>
<td>6</td>
<td>4</td>
<td>48</td>
</tr>
<tr>
<td>%</td>
<td>15.1%</td>
<td>7.5%</td>
<td>8.3%</td>
<td>12.6%</td>
</tr>
<tr>
<td>Dosimetry</td>
<td>Count: 7</td>
<td>4</td>
<td>3</td>
<td>14</td>
</tr>
<tr>
<td>%</td>
<td>2.8%</td>
<td>5.0%</td>
<td>6.3%</td>
<td>3.7%</td>
</tr>
<tr>
<td>HDR</td>
<td>Count: 14</td>
<td>3</td>
<td>7</td>
<td>24</td>
</tr>
<tr>
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<td>5.6%</td>
<td>3.8%</td>
<td>14.6%</td>
<td>6.3%</td>
</tr>
<tr>
<td>IGRT</td>
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<td>5</td>
<td>2</td>
<td>20</td>
</tr>
<tr>
<td>%</td>
<td>5.2%</td>
<td>6.3%</td>
<td>4.2%</td>
<td>5.3%</td>
</tr>
<tr>
<td>Proton therapy</td>
<td>Count: 21</td>
<td>6</td>
<td>6</td>
<td>33</td>
</tr>
<tr>
<td>%</td>
<td>8.3%</td>
<td>7.5%</td>
<td>12.5%</td>
<td>8.7%</td>
</tr>
<tr>
<td>SRS</td>
<td>Count: 17</td>
<td>9</td>
<td>7</td>
<td>33</td>
</tr>
<tr>
<td>%</td>
<td>6.7%</td>
<td>11.3%</td>
<td>14.6%</td>
<td>8.7%</td>
</tr>
<tr>
<td>Other</td>
<td>Count: 34</td>
<td>15</td>
<td>8</td>
<td>57</td>
</tr>
<tr>
<td>%</td>
<td>13.5%</td>
<td>18.8%</td>
<td>16.7%</td>
<td>15.0%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>Count</strong> 252</td>
<td><strong>80</strong></td>
<td><strong>48</strong></td>
<td><strong>380</strong></td>
</tr>
<tr>
<td>%</td>
<td><strong>100.0%</strong></td>
<td><strong>100.0%</strong></td>
<td><strong>100.0%</strong></td>
<td><strong>100.0%</strong></td>
</tr>
</tbody>
</table>

If you selected “yes” on the previous question, what are the areas that should be separately certified?  
(Coded from verbatim responses.)

- Radiation Therapist
- Manager
- Dosimetrist
### Continuing Education

**On average, how many hours each month do you spend on remote learning outside of the workplace?**

<table>
<thead>
<tr>
<th></th>
<th>Frequency</th>
<th>Percent</th>
<th>Valid Percent</th>
<th>Cumulative Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 hours</td>
<td>978</td>
<td>29.2</td>
<td>36.5</td>
<td>36.5</td>
</tr>
<tr>
<td>1 hour</td>
<td>456</td>
<td>13.6</td>
<td>17</td>
<td>53.4</td>
</tr>
<tr>
<td>2 hours</td>
<td>570</td>
<td>17.0</td>
<td>21.2</td>
<td>74.7</td>
</tr>
<tr>
<td>3 hours</td>
<td>125</td>
<td>3.7</td>
<td>4.7</td>
<td>79.4</td>
</tr>
<tr>
<td>4 hours</td>
<td>141</td>
<td>4.2</td>
<td>5.3</td>
<td>84.6</td>
</tr>
<tr>
<td>5 hours or more</td>
<td>413</td>
<td>12.3</td>
<td>15.4</td>
<td>100.0</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>2683</strong></td>
<td><strong>80.0</strong></td>
<td><strong>100.0</strong></td>
<td><strong>100.0</strong></td>
</tr>
<tr>
<td>Missing</td>
<td>672</td>
<td>20.0</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>3355</strong></td>
<td><strong>100.0</strong></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

---

**On average, how many hours each month do you spend on remote learning outside of the workplace?**
What is the ideal duration, in minutes, for a remote training session?

<table>
<thead>
<tr>
<th>Duration</th>
<th>Frequency</th>
<th>Percent</th>
<th>Valid Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>30 minutes or less</td>
<td>456</td>
<td>13.6</td>
<td>20.1</td>
</tr>
<tr>
<td>31- 60 minutes</td>
<td>1287</td>
<td>38.4</td>
<td>56.8</td>
</tr>
<tr>
<td>61 to 90 minutes</td>
<td>140</td>
<td>4.2</td>
<td>6.2</td>
</tr>
<tr>
<td>91 to 120 minutes</td>
<td>195</td>
<td>5.8</td>
<td>8.6</td>
</tr>
<tr>
<td>121 or more</td>
<td>93</td>
<td>2.8</td>
<td>4.1</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>2265</strong></td>
<td><strong>67.5</strong></td>
<td><strong>100.0</strong></td>
</tr>
<tr>
<td>Zero</td>
<td>94</td>
<td></td>
<td>2.8</td>
</tr>
<tr>
<td>Missing</td>
<td>1090</td>
<td></td>
<td>32.5</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>3355</strong></td>
<td></td>
<td><strong>100.0</strong></td>
</tr>
</tbody>
</table>

Mean minutes: 67.8 (SD=55.5)

Percentiles: 5th=25.5, 25th=42.3, 50th=55.9, 75th=71.2, 95th=145.0

What is the ideal duration, in minutes, for a remote training session?

- 30 minutes or less: 456 (13.6%)
- 31- 60 minutes: 1287 (38.4%)
- 61 to 90 minutes: 140 (4.2%)
- 91 to 120 minutes: 195 (5.8%)
- 121 or more: 93 (2.8%)

Do you, as a manager, have the latitude to facilitate time for training activities (vendor or otherwise)?

<table>
<thead>
<tr>
<th>Frequency</th>
<th>Percent</th>
<th>Valid Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>312</td>
<td>9.3</td>
</tr>
<tr>
<td>No</td>
<td>28</td>
<td>0.8</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>340</strong></td>
<td><strong>10.1</strong></td>
</tr>
</tbody>
</table>

Missing: 3015 (89.9%)

Do you, as a manager, have the latitude to facilitate time for training activities (vendor or otherwise)?
Please indicate if you have participated in any of the following learning events in the past two years.

- Yes: 312 (9.3%)
- No: 28 (0.8%)
<table>
<thead>
<tr>
<th>Learning Event</th>
<th>Frequency</th>
<th>Percent</th>
<th>Percent of Respondents</th>
</tr>
</thead>
<tbody>
<tr>
<td>Online learning (e-learning, remote training, webinars)</td>
<td>1996</td>
<td>21.1</td>
<td>59.5</td>
</tr>
<tr>
<td>On-site in-service/classes</td>
<td>1959</td>
<td>20.7</td>
<td>58.4</td>
</tr>
<tr>
<td>On-site vendor training</td>
<td>1738</td>
<td>18.4</td>
<td>51.8</td>
</tr>
<tr>
<td>Off-site conference attendance</td>
<td>1621</td>
<td>17.2</td>
<td>48.3</td>
</tr>
<tr>
<td>Vendor-sponsored online learning (e-learning, remote training, webinars)</td>
<td>1290</td>
<td>13.7</td>
<td>38.5</td>
</tr>
<tr>
<td>Off-site vendor training</td>
<td>480</td>
<td>5.1</td>
<td>14.3</td>
</tr>
<tr>
<td>Academic classes</td>
<td>357</td>
<td>3.8</td>
<td>10.6</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>9441</strong></td>
<td><strong>100.0</strong></td>
<td><strong>281.4</strong></td>
</tr>
</tbody>
</table>

Please indicate if you have participated in any of the following learning events in the past two years.
What sources of information do you use to keep up to date on advances in your discipline?

<table>
<thead>
<tr>
<th>Source</th>
<th>Radiation Therapist</th>
<th>Manager</th>
<th>Dosimetry</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Radiation oncologists</td>
<td>1381</td>
<td>268</td>
<td>379</td>
<td>2028</td>
</tr>
<tr>
<td>% within</td>
<td>65.8%</td>
<td>78.1%</td>
<td>70.2%</td>
<td></td>
</tr>
<tr>
<td>Other radiation therapists</td>
<td>1363</td>
<td>235</td>
<td>186</td>
<td>1784</td>
</tr>
<tr>
<td>% within</td>
<td>65.0%</td>
<td>68.5%</td>
<td>34.4%</td>
<td></td>
</tr>
<tr>
<td>Employer-provided workshops</td>
<td>556</td>
<td>97</td>
<td>131</td>
<td>784</td>
</tr>
<tr>
<td>% within</td>
<td>26.5%</td>
<td>28.3%</td>
<td>24.3%</td>
<td></td>
</tr>
<tr>
<td>Vendor representatives</td>
<td>860</td>
<td>243</td>
<td>260</td>
<td>1363</td>
</tr>
<tr>
<td>% within</td>
<td>41.0%</td>
<td>70.8%</td>
<td>48.1%</td>
<td></td>
</tr>
<tr>
<td>Professional conferences</td>
<td>1112</td>
<td>291</td>
<td>428</td>
<td>1831</td>
</tr>
<tr>
<td>% within</td>
<td>53.0%</td>
<td>84.8%</td>
<td>79.3%</td>
<td></td>
</tr>
<tr>
<td>Professional journals</td>
<td>1895</td>
<td>317</td>
<td>495</td>
<td>2707</td>
</tr>
<tr>
<td>% within</td>
<td>90.3%</td>
<td>92.4%</td>
<td>91.7%</td>
<td></td>
</tr>
<tr>
<td>Professional magazines</td>
<td>1578</td>
<td>266</td>
<td>340</td>
<td>2184</td>
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<tr>
<td>% within</td>
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<td>77.6%</td>
<td>63.0%</td>
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<tr>
<td>Listservers</td>
<td>73</td>
<td>134</td>
<td>140</td>
<td>347</td>
</tr>
<tr>
<td>% within</td>
<td>3.5%</td>
<td>39.1%</td>
<td>25.9%</td>
<td></td>
</tr>
<tr>
<td>Other</td>
<td>59</td>
<td>12</td>
<td>31</td>
<td>102</td>
</tr>
<tr>
<td>% within</td>
<td>2.8%</td>
<td>3.5%</td>
<td>5.7%</td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>2098</strong></td>
<td><strong>343</strong></td>
<td><strong>540</strong></td>
<td><strong>2981</strong></td>
</tr>
</tbody>
</table>

- **Radiation Therapist**
- **Manager**
- **Dosimetry**

What sources of information do you use to keep up to date on advances in your discipline?
Where do you find available CE opportunities?

<table>
<thead>
<tr>
<th></th>
<th>Radiation Therapist</th>
<th>Manager</th>
<th>Dosimetry</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>ASRT Scanner</td>
<td>1274</td>
<td>191</td>
<td>237</td>
<td>1702</td>
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<td>45.3%</td>
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<td>ASRT website</td>
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<td>220</td>
<td>296</td>
<td>1928</td>
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<td>67.9%</td>
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<td>56.6%</td>
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<tr>
<td>ARRT website</td>
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<td>123</td>
<td>738</td>
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<tr>
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<td>26.3%</td>
<td>23.5%</td>
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</tr>
<tr>
<td>Local society</td>
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<td>99</td>
<td>470</td>
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<tr>
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<td>14.7%</td>
<td>19.7%</td>
<td>18.9%</td>
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<tr>
<td>Recommendation</td>
<td>189</td>
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<td>64</td>
<td>294</td>
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<tr>
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<td>12.2%</td>
<td>12.2%</td>
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<tr>
<td>Online search</td>
<td>257</td>
<td>51</td>
<td>91</td>
<td>399</td>
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<tr>
<td>% within</td>
<td>12.4%</td>
<td>15.2%</td>
<td>17.4%</td>
<td></td>
</tr>
<tr>
<td>Your institution</td>
<td>477</td>
<td>90</td>
<td>108</td>
<td>675</td>
</tr>
<tr>
<td>% within</td>
<td>22.9%</td>
<td>26.9%</td>
<td>20.7%</td>
<td></td>
</tr>
<tr>
<td>Other</td>
<td>131</td>
<td>47</td>
<td>145</td>
<td>323</td>
</tr>
<tr>
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<td>6.3%</td>
<td>14.0%</td>
<td>27.7%</td>
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<tr>
<td>Total</td>
<td>Count 2079</td>
<td>335</td>
<td>523</td>
<td>2937</td>
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</table>

Where do you find available CE opportunities?
Aside from the mandatory nature of CE, what do you primarily hope to gain from CE products?

<table>
<thead>
<tr>
<th></th>
<th>Radiation Therapist</th>
<th>Manager</th>
<th>Dosimetry</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Preparaiton for career advancement</td>
<td>Count 94</td>
<td>7</td>
<td>10</td>
<td>111</td>
</tr>
<tr>
<td></td>
<td>% within 4.5%</td>
<td>2.1%</td>
<td>1.9%</td>
<td>3.7%</td>
</tr>
<tr>
<td>Improvement in patient care delivery</td>
<td>Count 538</td>
<td>83</td>
<td>120</td>
<td>741</td>
</tr>
<tr>
<td></td>
<td>% within 25.7%</td>
<td>24.4%</td>
<td>22.2%</td>
<td>24.9%</td>
</tr>
<tr>
<td>Staying updated on technological trends</td>
<td>Count 916</td>
<td>161</td>
<td>254</td>
<td>1331</td>
</tr>
<tr>
<td></td>
<td>% within 43.8%</td>
<td>47.4%</td>
<td>47.0%</td>
<td>44.8%</td>
</tr>
<tr>
<td>Filling gaps in knowledge or skills</td>
<td>Count 398</td>
<td>59</td>
<td>110</td>
<td>567</td>
</tr>
<tr>
<td></td>
<td>% within 19.0%</td>
<td>17.4%</td>
<td>20.4%</td>
<td>19.1%</td>
</tr>
<tr>
<td>Improved ability to critically evaluate multiple information sources</td>
<td>Count 125</td>
<td>24</td>
<td>40</td>
<td>189</td>
</tr>
<tr>
<td></td>
<td>% within 6.0%</td>
<td>7.1%</td>
<td>7.4%</td>
<td>6.4%</td>
</tr>
<tr>
<td>Other</td>
<td>Count 21</td>
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<td>6</td>
<td>33</td>
</tr>
<tr>
<td></td>
<td>% within 1.0%</td>
<td>1.8%</td>
<td>1.1%</td>
<td>1.1%</td>
</tr>
<tr>
<td>Total</td>
<td>Count 2092</td>
<td>340</td>
<td>540</td>
<td>2972</td>
</tr>
<tr>
<td></td>
<td>% within 100.0%</td>
<td>100.0%</td>
<td>100.0%</td>
<td>100.0%</td>
</tr>
</tbody>
</table>
Appendix A. Survey Instruments and Invitation Letter (Please contact ASRT Member Services for a copy.)
Appendix B. Verbatim responses (Please contact ASRT Member Services for a copy.)