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Enrollment Snapshot of Radiography, Radiation Therapy and Nuclear Medicine Technology Programs 2010

A Nationwide Survey of Registered Radiologic Technologists Conducted by the American Society of Radiologic Technologists

Reported January 2011



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Executive Summary

In early October 2010, an invitation to complete an online questionnaire was sent via e-mail to each of the 1,009 radiography, radiation therapy and nuclear medicine technology programs listed by the American Registry of Radiologic Technologists (ARRT). At the close of the survey on December 1, 2010, a total of 629 responses had been received, yielding an overall response rate of 62%.

	Return	Population	Percent Sampled	Margin of Error at the 95% Level
Radiography	492	751	65.5%	±2.6%
Radiation Therapy	71	122	58.2%	±7.5%
Nuclear Medicine Technology	66	136	48.5%	±8.7%
Overall	629	1,009	62.3%	±2.4%

This report summarizes findings regarding radiologic sciences enrollment based on the responses from program directors.

Longitudinal Enrollment Trends 2001-2010

This is the tenth in a series of annual reports from the ASRT on class enrollments in educational programs for radiographers, radiation therapists and nuclear medicine technologists. The current report includes a section that summarizes the last 10 years of enrollment trends. See pages 15-18 for a review of those findings.

Demographic Analysis

- About 40% of the programs are located in community colleges or two-year institutions; 25% are in medical centers; 22% are in university or four-year institutions; 9% are in technical college and 4% are in for-profit schools.
- Approximately 59% of program directors indicated that the terminal degree earned by graduates is an associate degree; 25% receive a certificate and 16% receive a bachelor's degree.
- Certificate programs with an articulation agreement reported that about half (54.4%) award their students with an associate's degree upon completion of their program, whereas 23.5% do not receive their degree

until successful completion of the ARRT exam. In addition, 8.3% stated that they have no articulation agreement.

- Almost all of the programs are in the United States (99%).
- The highest return rate came from the West South Central area of the United States (72.9%), with the lowest coming from the South Atlantic (56.1%).

2010 Enrollment Trends

- The mean number of students entering programs per class is 21.2 for radiography, 11.3 for radiation therapy, and 11.3 for nuclear medicine technology.
 - This produces an overall estimate of 15,948 radiography students, 1,462 radiation therapy students and 1,534 nuclear medicine technology students entering programs for 2010.
 - These estimates represent decreases (ranging from 4.8% for radiography and 2.9% for radiation therapy programs) relative to 2009 enrollments, except for nuclear medicine technology, which increased 5.3%.
- Radiography had the highest attrition rate, with a mean of 23.3%, compared to 18.3% for radiation therapy and 12.9% for nuclear medicine technology.

First percentage cited in parentheses is weighted to ARRT state percentages, but not by discipline. Note: All statistics (except for Ns and percents) are weighted to national ARRT population.



2010 Student Capacity

- About 56% of radiography and 51% of radiation therapy program directors reported that they are at full enrollment. Only 21% of nuclear medicine technology programs reported full enrollment.
- Of those programs that are not at full enrollment, the mean number of additional students that could be accommodated per program is 7.6 for radiography, 7.9 for radiation therapy and 7.0 for nuclear medicine technology.
 - This produces an estimate of 2,490 additional students that could be accommodated in radiography programs; 475 in radiation therapy; and 748 in nuclear medicine technology programs.
- The mean number of qualified students turned away per program was 39.1 for radiography, 18.0 for radiation therapy and 12.9 for nuclear medicine technology.
 - This produces an estimate of 16,528 qualified students turned away in radiography; 1,112 in radiation therapy; and 372 in nuclear medicine.

Near-Term Changes

- About 11% of radiography program directors, 10% of radiation therapy program directors and 4.5% of nuclear medicine technology program directors reported that they plan to decrease enrollments.
- About 4.7% of radiography program directors, 5.7% of radiation therapy program directors and 9.1% of nuclear medicine technology program directors plan to increase enrollment.

Job Placement of Graduates

- About 82% of radiography students, 77% of radiation therapy students and 71% of nuclear medicine technology students were able to find employment in their discipline within six months of graduating in 2009.
- This employment rate represents a decline from 2008 of 7.1 percentage points in radiography, 3.7 in radiation therapy and 12.6 in nuclear medicine technology.
- When asked why students haven't been able to find employment after graduation, the most common reason among all three disciplines (58.5%) was that "Too many graduate in relation to the number of open positions."

Technologies in the Classroom and Curriculum

- Digital only (CR or DR) was the most common imaging technology used at clinical sites for all three disciplines (63.3%).
- About 43% of radiography programs indicated that they have film/screen and digital at their on-campus lab.
- Approximately 64% of radiation therapy and nuclear medicine technology programs do not have an oncampus lab.
- About 32% of program directors would like to see the CT content found in the current ASRT curriculum slightly to greatly expanded; 46% indicated that it should remain the same, and approximately 11% would like to see it eliminated.
- Exactly 11% of nuclear medicine technology classes can be taken online. About 4% of radiography and 5.5% of radiation therapy classes can be taken online.

Demographics

Indicate your program type.

	Frequency	Valid Percent	Population Distribution	Sample Return Percent of Population
Radiography	492	78.2	751	65.5
Radiation therapy	71	11.3	122	58.2
Nuclear medicine technology	66	10.5	136	48.5
Total	629	100.0	1009	62.3

Indicate your program type.



What is your primary place of employment?

	Frequency	Valid Percent
Community college or two-year institution	251	39.9
Medical center	155	24.6
University or four-year institution	141	22.4
Technical college	54	8.6
For-profit school	22	3.5
Other	6	1.0
Total	629	100.0





What is the terminal degree earned by your graduates?

	Frequency	Valid Percent
Certificate	159	25.3
Associate degree	368	58.5
Bachelor's degree	100	15.9
Other	2	.3
Total	629	100.0

What is the terminal degree earned by your graduates?



If yours is a certificate program with an articulation agreement, when do your graduates receive their associate degree?

	Frequency	Valid Percent
After completion of the program	86	54.8
After successful completion of ARRT registry exam	37	23.5
After completion of program students receive a Bachelor's	9	5.7
Associate's degree is a requirement for admission into the program	7	4.5
No articulation agreement	13	8.3
Other	5	3.2
Total	157	100.0



When do your graduates receive their associate degree?

In what country is your program located?

	Frequency	Valid Percent
United States	619	98.7
Australia	1	.2
Canada	4	.6
Other (Puerto Rico)	3	.5
Total	627	100.0

In what country is your program located?



In what region is your program located?

			Discipline		Sample Distribution	Population Distribution	Sample Return
		Radiography	Radiation Therapy	Nuclear Medicine Technology			Percent of Population
New England	Count	26	7	6	39	55	
(ME, NH, VT, MA,RI, CT)	%	5.4%	10.1%	9.1%	6.3%	5.7%	70.9%
Mid-Atlantic	Count	52	8	11	71	122	E9 204
(NY, PA, NJ)	%	10.8%	11.6%	16.7%	11.5%	12.7%	58.2%
East North	Count	94	11	12	117	165	
Central (WI, MI, IL, IN, OH)	%	19.5%	15.9%	18.2%	19.0%	17.2%	70.9%
West North	Count	50	7	7	64	92	
Central (ND, SD, NE, KS, MN, IA, MO)	%	10.4%	10.1%	10.6%	10.4%	9.6%	69.6%
South	Count	99	15	11	125	223	
Atlantic (DE, MD, DC, VA, WV, NC, SC, GA, FL)	%	20.5%	21.7%	16.7%	20.3%	23.3%	56.1%
East South	Count	32	6	6	44	72	
Central (KY, TN, MS, AL)	%	6.6%	8.7%	9.1%	7.1%	7.5%	61.1%
West South	Count	61	10	7	78	107	
Central (OK, TX, AR, LA)	%	12.7%	14.5%	10.6%	12.6%	11.2%	72.9%
Mountain	Count	32	0	3	35	55	
(ID, MT, WY, NV, UT, CO, AZ, NM)	%	6.6%	0.0%	4.5%	5.7%	5.7%	63.6%
Pacific	Count	36	5	3	44	66	
(AK, WA, OR, CA, HI)	%	7.5%	7.2%	4.5%	7.1%	6.9%	66.7%
Total	Count	482	69	66	617	957 ª	64 504
iulai	%	100.0%	100.0%	100.0%	100.0%	100.0%	04.3%

^aTotal does not include programs outside of the United States.



In what region is your program located?



2010 Enrollment Analysis

How many students entered your program?

	Radiogr	aphy		Radiation 7	Thera	ру	Nuclear M Techno	edicir logy	ne	Over		
	Mean number of students entering program per class	N	SD	Mean number of students entering program per class	N	SD	Mean number of students entering program	N	SD	Mean number of students entering program per class	Ν	SD
Technical college	21.1	46	14.2	11.5	4	4.7	14.5	2	7.8	20.1	52	13.7
Community college or two-year institution	24.4	208	11.5	10.8	23	6.5	15.2	20	5.8	22.4	251	11.7
University or four-year institution	25.8	85	14.7	15.5 27		15.3	11.2	26	9.7	21.0	138	15.3
Medical center	11.8	124	6.1	7.4	15	3.9	5.7	14	2.6	10.8	153	6.0
For-profit school	30.4	18	18.7	14.0	1	•	9.0	2	1.4	27.6	21	18.7
Other	16.5	6	4.0	•	•	•	•	•	•	16.5	6	4.0
Total	21.2	487	13.0	12.0	70	10.8	11.3	64	7.9	19.2	621	12.9

Mean number of students entering program



Community college or two-year institution

University or four-year

		Radiography	Radiation therapy	Nuclear medicine technology	Overall
Vac	Count	276	36	14	326
res	%	56.3%	50.7%	21.2%	52.0%
Ne	Count	214	35	52	301
INO	%	43.7%	49.3%	78.8%	48.0%
Total	Count	490	71	66	627
TOLAI	%	100.0%	100.0%	100.0%	100.0%

Is your program currently at full enrollment?

Is your program currently at full enrollment?



If you are not at full enrollment, how many additional students could be accommodated by your program?

Ra	diograp	hy	Radiation therapy			Nuclea	Overall				
Mean	Ν	SD	Mean	Ν	SD	Mean	N	SD	Mean	N	SD
7.6	233	10.4	7.9	38	8.9	7.0	319	9.1	7.5	319	10.0

How many qualified students did you turn away this fall?

Radiography Radiation therapy			Nuclea	nnology	Overall						
Mean	N	SD	Mean	Ν	SD	Mean	N	SD	Mean	N	SD
39.1	463	56.8	18.0	68	22.2	12.9	593	21.1	33.9	593	10.0

Attrition rate

Ra	diograp	hy	Rac	liation t	herapy	Nuclear n	nedicine techn	ology		Overall	
Mean	Ν	SD	Mean	Ν	SD	Mean	Ν	SD	Mean	Ν	SD
23.30%	464	26.40%	18.30%	62	29.70%	12.90%	62	17.30%	21.70%	588	26.20%

Mean number of students that could be accommodated



Mean number of students turned away





Mean Attrition Rate

			Discipline		
		Radiography	Radiation therapy	Nuclear medicine technology	Overall
Plan to increase	Count	23	4	6	33
	%	4.7%	5.7%	9.1%	5.3%
Plan to decrease	Count	54	7	3	64
	%	11.0%	10.0%	4.5%	10.2%
Plan to remain the same	Count	414	59	57	530
	%	84.3%	84.3%	86.4%	84.5%
Total	Count	491	70	66	627
	%	100.0%	100.0%	100.0%	100.0%

Do you plan any changes related to enrollment?

Do you plan any changes related to enrollment?



			Discipline		
		Radiography	Radiation therapy	Nuclear medicine technology	Overall
Will definitely continue to operate	Count	387	45	43	475
	%	79.0%	66.2%	66.2%	76.2%
Most likely will continue to operate	Count	100	20	22	142
	%	20.4%	29.4%	33.8%	22.8%
Most likely will be closing	Count	1	2	0	3
	%	.2%	2.9%	0.0%	.5%
Definitely will be closing	Count	2	1	0	3
	%	.4%	1.5%	.0%	.5%
Total	Count	490	68	65	623
	%	100.0%	100.0%	100.0%	100.0%

How viable is your program over the next few years?

How viable is your program over the next few years?



If your program is closing, how many more years will it continue to operate, including this academic year?

Program type	N	Mean Years	SD
Radiography	2	1.0	0.0
Radiation therapy	3	1.7	1.5

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Longitudinal Enrollment Trends 2001-2010

Radiography

n Estimated ied total s per qualified am students away turned away		13,766	23,550	29,531	27,131	33,148	28,556	24,914	19,386	16.528
ts qualified and the student: er programe student: er programe student: er programe sturned a y		31.6	46.8	55.1	50.9	59.2	56.8	50.4	43.4	39.1
Estimated total additional studen that could be accommodated pe program for progra not at full capacit	•	1,688	741	1,106	1,104	1,142	1,558	2,073	1,088	2,490
Mean number of additional students that could be accommodated per program for those not at full capacity	•	8.7	5.8	7.5	7.4	7.0	1.7	8.4	3.7	7.6
Percent of programs not at full capacity	50.2%	30.9%	21.2%	21.7%	20.9%	22.6%	30.2%	33.3%	40.0%	43.7%
Mean attrition rate	21.6%	23.6%	21.6%	20.5%	18.1%	18.4%	17.8%	21.1%	20.8%	23.3%
Estimated total students enrolled for all programs	12,529	14,734	14,965	15,683	16,475	17,323	16,612	17,050	16,759	15,948
Mean number of students entering program	21.2	23.4	23.4	22.9	22.8	24.0	22.8	23.0	22.5	21.2
Percent of programs responding to survey with enrollment data	75.4%	67.5%	71.4%	68.7%	65.5%	73.7%	67.9%	70.1%	60.1%	64.8%
ARRT- recognized programs	590	631	639	684	715	723	729	742	746	751
Year	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010





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adiat	ion Therapy									
Year	ARRT- recognized programs	Percent of programs responding to survey with enrollment data	Mean number of students entering classroom	Estimated total students enrolled for all programs	Mean attrition rate	Percent of programs not at full capacity	Mean number of additional students that could be accommodated per program for those not at full capacity	Estimated total additional students that could be accommodated per program for programs not at full capacity	Mean qualified students per program turned away	Estimated total qualified students turned away
2001	86	60.5%	10.0	860	18.1%	44.4%				
2002	95	59.9%	14.0	1,326	11.1%	48.0%	5.7	261	9.1	449
2003	101	57.4%	12.6	1,274	18.0%	44.6%	4.4	200	13.6	758
2004	105	55.2%	14.4	1,513	11.9%	30.5%	12.5	400	13.4	974
2005	113	56.6%	12.5	1,382	16.8%	32.1%	3.4	124	24.5	1,880
2006	118	67.8%	11.0	1,295	16.6%	49.3%	6.4	373	21.6	1,291
2007	122	54.1%	12.9	1,577	15.2%	51.5%	6.3	395	13.3	931
2008	125	49.6%	10.5	1,314	14.4%	58.6%	4.5	330	33.0	1,708
2009	122	49.2%	12.5	1,505	10.9%	55.5%	3.7	243	15.8	869
2010	122	57.4%	12.0	1,462	18.3%	49.3%	7.9	475	18.0	1,112





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Nuclear Medicine Technology

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Year	AKK I- recognized programs	Percent or programs responding to survey with enrollment	Mean number of students entering classroom	Estimated total students enrolled for all	Mean attrition rate	Percent of programs not at full capacity	Mean number of additional students that could be accommodated per program for those	Estimated total additional students that could be accommodated per program for programs	Mean qualified students per program turned away	Estimated total qualified students turned
2001	101	62.4%	12.4	1,252	11.8%	53.2%		· ·		
2002	104	55.8%	14.0	1,454	8.0%	35.7%	6.7	251	19.7	1,381
2003	111	59.5%	14.5	1,612	7.1%	33.3%	2.7	180	32.1	2,375
2004	117	58.1%	14.0	1,633	9.8%	20.9%	3.6	88	24.4	2,258
2005	122	51.6%	13.7	1,698	8.6%	30.6%	5.1	191	32.9	2,786
2006	131	71.8%	15.5	2,033	10.2%	31.8%	5.7	238	30.2	2,697
2007	132	55.3%	13.5	1,781	8.3%	39.7%	6.3	331	24.2	1,916
2008	136	59.5%	12.2	1,660	12.3%	58.4%	10.0	794	18.2	1,032
2009	136	47.5%	10.8	1,482	7.0%	63.0%	4.3	416	9.3	473
2010	136	47.1%	11.3	1,534	12.9%	78.8%	7.0	748	12.9	372







Number of ARRT-Recognized Programs









Job Placement of Graduates

What is the job placement percent rate of students finding employment in their discipline within six months of graduation from your program?

		Radiog	Jraphy	Radiatio	on Therapy	Nuclear Tech	[.] Medicine nology
		2008	2009	2008	2009	2008	2009
New England (ME, NH, VT, MA,RI,	Ν	25	25	6	7	4	4
CT)	Mean	91.6%	86.2%	82.0%	84.2%	83.8%	63.8%
Mid-Atlantic (NY, PA, NJ)	Ν	50	50	5	6	8	9
	Mean	89.7%	80.3%	85.4%	83.2%	79.4%	61.6%
East North Central (WI, MI, IL, IN,	Ν	91	89	10	11	10	11
OH)	Mean	89.0%	81.1%	82.6%	70.4%	76.7%	63.6%
West North Central (ND, SD, NE,	Ν	43	46	7	7	6	7
KS, MN, IA, MO)	Mean	90.2%	84.1%	98.4%	85.3%	86.0%	69.6%
South Atlantic (DE, MD, DC, VA,	Ν	92	93	14	13	11	11
WV, NC, SC, GA, FL, PR)	Mean	88.9%	82.7%	70.5%	70.5%	80.0%	72.4%
East South Central (KY, TN, MS, AL)	Ν	32	32	6	6	6	5
	Mean	88.6%	86.3%	64.2%	63.3%	91.2%	87.4%
West South Central (OK, TX, AR,	Ν	55	60	9	8	7	7
LA)	Mean	86.5%	84.5%	80.1%	79.8%	90.1%	77.0%
Mountain (ID, MT , WY, NV, UT, CO,	Ν	30	32	•		3	3
AZ, NM)	Mean	89.8%	79.1%	•		87.3%	81.7%
Pacific (AK, WA, OR, CA, HI)	Ν	34	33	5	5	3	2
	Mean	91.9%	77.8%	96.4%	92.0%	83.9%	76.7%
	Ν	452	460	62	63	58	59
Overall	Mean	89.3%	82.2%	81.1%	77.4%	83.2%	70.6%
	SD	16.5%	19.4%	23.5%	22.6%	21.1%	26.4%

Overall Job Placement Percent Rate





Radiography Job Placement Percent Rate



Radiation Therapy Job Placement Percent Rate



Nuclear Medicine Technology Job Placement Percent Rate



		Radiography	Radiation therapy	Nuclear medicine technology
Too many graduates in relation to the	Count	253	35	35
number of open positions	%	59.70%	56.50%	59.30%
Current workforce is delaying retirement	Count	139	14	23
	%	32.80%	22.60%	39.00%
Management not filling open positions	Count	119	13	17
	%	28.10%	21.00%	28.80%
Hospital closings	Count	14	0	4
	%	3.30%	0.00%	6.80%
Facilities cutting back positions	Count	186	21	23
	%	43.90%	33.90%	39.00%
Graduates continuing on for more edu-	Count	17	2	2
cation*	%	4.00%	3.20%	3.40%
Poor economy*	Count	25	3	2
	%	5.90%	4.80%	3.40%
Other	Count	20	6	3
	%	4.70%	9.70%	5.10%
Total	Count	424	62	59

For those students who haven't been able to find employment after graduation, what do you believe is the primary reason?

*Coded from verbatim responses

For those students who haven't been able to find employment after graduation, what do you believe is the primary reason?



Technologies in the Classroom And Curriculum

			Discipline			
		Radiography	Radiation therapy	Nuclear medicine technology	Overall	
Film/screen only	Count	0	0	7	7	
	%	0.0%	0.0%	15.9%	1.2%	
Digital only	Count	311	33	33	377	
	%	63.3%	54.1%	75.0%	63.3%	
Film/screen and digital	Count	180	28	4	212	
	%	36.7%	45.9%	9.1%	35.6%	
Total	Count	491	61	44	596	
lotai	%	100.0%	100.0%	100.0%	100.0%	

Which of the following imaging technologies are used at your clinical sites?

Which of the following imaging technologies are used at your clinical sites?



		Radiography	Radiation therapy	Nuclear medicine technology	Overall
Film/screen only	Count	56	2	3	61
	%	11.4%	3.0%	5.7%	10.0%
Digital only	Count	145	13	15	173
	%	29.6%	19.7%	28.3%	28.4%
Film/screen and digital	Count	209	9	1	219
	%	42.7%	13.6%	1.9%	36.0%
We do not have an on-campus lab.	Count	80	42	34	156
	%	16.3%	63.6%	64.2%	25.6%
Total	Count	490	66	53	609
	%	100.0%	100.0%	100.0%	100.0%

Which of the following technologies are used in your on-campus lab?

Which of the following technologies are used in your on-campus lab?



		Radiography	Radiation therapy	Nuclear medicine technology	Overall
Greatly expanded	Count	31	3	9	43
	%	6.3%	4.4%	16.1%	7.0%
Slightly expanded	Count	112	21	20	153
	%	22.9%	30.9%	35.7%	24.9%
Remain the same	Count	216	40	24	280
	%	44.1%	58.8%	42.9%	45.6%
Slightly reduced	Count	30	2	2	34
	%	6.1%	2.9%	3.6%	5.5%
Greatly reduced	Count	37	2	0	39
	%	7.6%	2.9%	.0%	6.4%
Eliminated	Count	64	0	1	65
	%	13.1%	.0%	1.8%	10.6%
Total	Count	490	68	56	614
	%	100.0%	100.0%	100.0%	100.0%

In your opinion, computed tomography content found in the current ASRT curriculum should be:

In your opinion, computed tomography content found in the current ASRT curriculum should be:



What percent of the classes in your curriculum can be taken online?

Program type	N	Mean	SD
Radiography	311	4.2%	11.3%
Radiation therapy	44	5.5%	15.6%
Nuclear medicine technology	45	11.0%	22.7%
Total	400	5.1%	13.7%

Mean percent of classes offered online





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.)