

Nuclear Medicine Facility Survey: SNM 2003 Survey Reporting on 2002 Cost and Utilization

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The Society of Nuclear Medicine and the Society of Nuclear Medicine Technologist Section conducted a survey in the fall of 2003 to obtain an understanding of current nuclear medicine workforce demographics and facility utilization patterns during 2002. This article will focus on cost and utilization data as reported in that survey. Analysis was conducted with the assistance of Sage Computing of Herndon, VA.

The mail survey was sent out to 4,425 nuclear medicine facilities across the United States, using a chief technologist as the contact person. A total of 983 surveys were returned, yielding a 22% response rate. For purposes of analysis, the responses were divided into "hospitals" versus "nonhospitals." Of the returned surveys, 58% identified "hospital" as the facility type.

It is important to note that not all facilities responded in all fields. This was an expected result in some fields, confirming the wide variety of radiopharmaceutical choices and variance of procedures performed in nuclear medicine facilities. However, 10–18% of the facilities did not report total procedures. This was not anticipated and is noted in the "% reporting" row in Table 1. When less than 5 facilities reported on a procedure or radiopharmaceutical, we did not report the results.

Hospitals Size and Operation Hours

Hospital data were sorted by bed size ranges as follows: 0–125, 126–300, 301–499 and 500+ beds. The number of licensed hospital beds in these facilities ranged from 15 to 1,100 with an average of around 212 beds. The majority of hospitals, 67%, reported they were community-based facilities, 23% were private, 8% were government, and 2% were university hospitals. In the range "0–125 beds", 68% were community hospitals and none were university hospitals. In the range "500+ beds", 47% were community hospitals and 12% were government hospitals.

Several survey items were designed to understand the operational aspects of facilities and to ensure we would be able to compare volume with like facilities for benchmark-

ing. The respondents for each survey were asked to provide days and hours of operation as well as wait times. The majority of hospitals operated at least 5 days per week with 66% of the hospitals offering routine nuclear medicine procedures 5 days a week, whereas another 29% of the hospitals offered services 6–7 days per week. Of the smaller hospitals (0–125 beds), 74% of the hospitals offered nuclear medicine services 5 days a week. More than half of the hospitals with more than 300 beds offered nuclear medicine services 6–7 days a week. Of the hospitals surveyed, 45% were open 45 hours or less per week for routine nuclear medicine patient services. Smaller hospitals tended to be open for fewer hours than larger hospitals. Of the hospitals in the "0–125 beds" category, 65% were open 45 hours or less for routine nuclear medicine services, whereas 30% of the hospitals with 500+ beds were open 80 hours per week or more. These data suggest there are differences between large and small hospitals regarding volume; therefore, we are supplying detailed procedure volume data by hospital size. (See Table 2.)

When responders were asked about the average wait time for nonurgent nuclear medicine procedures, 58% of the hospital-based facilities reported an average of 2 days or less for nuclear cardiology procedures. A wait time of 3–4 days for these procedures was reported by 16%, whereas 12% reported wait times of 1 week or more. For PET procedures, 14% of the hospital-based respondents indicated wait times for PET procedures of 1 week. For all other nuclear medicine procedures, 64% reported an average wait time of 2 days or less. None of the hospital-based facilities had a wait time of more than 3 weeks.

Hospital Purchasing Practices

We next asked facilities to tell us if they planned to upgrade or purchase new equipment in the next year. Approximately 42% of the hospital-based facilities indicated that their facility was planning to upgrade or purchase nuclear medicine equipment in the next year. Interestingly, 80% of these upgrades or purchases were for SPECT equipment. We call your attention to the fact that this survey was performed in the fall of 2003 so this expected purchase of SPECT equipment should have taken place in 2004. It will be important to monitor this moving forward, especially in

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TABLE 1
Average (Mean) Nuclear Medicine Procedures

	Hospital-based Facilities by Number of Beds					Nonhospitals
	0-125	126-300	301-499	500+	All Hospitals	
Outpatient Procedures	995	2479	3967	6025	2318	2093
Inpatient Procedures	371	1386	2116	4228	1253	
% Reporting	83%	82%	90%	82%	83%	84%

light of the new SPECT/CT and PET/CT equipment, to see if purchase practices are changing.

We understand facilities have options regarding the method of purchase of their radiopharmaceuticals so we

asked the respondents to tell us, in general, how they purchase their radiopharmaceuticals. We did not ask for details or specifics on each radiopharmaceutical so the information presented is generalized. Of the hospital-based facilities,

TABLE 2
Nuclear Medicine Procedure Volume*

Facilities Reporting Hospital/ Nonhospital	Code and Procedure	Hospital-based Facilities by Number of Beds					Nonhospitals
		0-125	126-300	301-499	500+	All Hospitals	
423/109	78000-78011 Thyroid Imaging and Uptake	44	120	187	228	102	126
413/106	78015, 78020 Thyroid Carcinoma Metastases Imaging	1	9	32	49	11	4
419/108	78070, 78075 Parathyroid & Adrenal	3	13	27	68	14	10
418/106	78195 Lymphatics and Lymph Node	6	21	56	101	23	5
421/108	78185, 78201-78220 Liver & Spleen	5	21	24	45	16	14
423/109	78223 Hepatobiliary	97	187	283	238	170	88
423/109	78300-78320 Bone Scan	279	648	1067	1138	567	436
423/106	78580-78596 Ventilation & Perfusion Scans	66	272	433	608	219	19
417/105	78600-78615 Brain Imaging including SPECT	1	8	11	34	7	7
422/109	78700-78725 Renal Imaging	26	69	122	155	68	45
414/107	78730-78740 Ureteral Reflux & Retention Study	3	13	5	23	7	1
415/106	78760-78761 Testicular Imaging	1	1	1	2	1	0
419/107	78800-78803 Localization of Tumor	4	20	39	129	24	15
419/106	78805-78807 Localization of Abscess	5	23	39	83	23	11
431/331	78465 MPI Multiple studies Stress and Rest (SPECT)	443	1121	1562	2199	956	1582
421/338	78464 MPI Single Study Stress or Rest (SPECT)	47	53	115	100	62	95
416/328	78461 MPI Multiple Studies Stress and Rest (Planar)	7	10	36	20	13	8
417/341	78460 MPI Single Study Stress or Rest (Planar)	0	1	2	6	1	5
425/340	78478 MPI WM add-on	382	766	1204	1811	725	1282
426/327	78480 MPI EF add-on	382	773	1271	1827	738	1285
419/327	78494 GBP, SPECT, WM, EF, Resting	22	34	93	0	35	79
427/332	78496, 78473 GBP Planar multiple studies with RVEF	22	60	133	172	60	21
389/343	78472 GBP Planar Single	9	9	49	32	16	10
281/39	79000-79020 Thyroid non-cancer	12	35	54	97	36	32
277/38	79030, 79035 Thyroid Carcinoma	2	9	20	45	12	4
62/18	G0125, G0210-G0212, G0234 PET Lung	17	66	79	162	102	100
61/18	G0213-G0215, G0231 PET Colorectal	7	16	22	48	34	19
60/18	G0216-G0218, G0233 PET Melanoma	2	7	10	30	15	11
60/18	G0220-G0222, G0232 PET Lymphoma	11	25	38	84	52	35
60/17	G0223-G0225 PET Head and Neck Tumors	1	6	8	30	13	11
59/16	G0226-G0228 PET Esophageal	3	5	6	19	9	5
60/16	78810 PET Tumor	0	7	12	71	24	67
60/17	G0252-G0254 PET Breast	10	9	10	10	9	9
59/13	G0219 PET Non-covered indications	1	1	4	5	4	2
59/15	G0229-78608, 78609 PET Brain	0	0	0	0	0	6
58/17	G0230, 78459, 78491, 78492 PET Cardiac	1	0	0	0	0	5
58/14	G0032-G0047 PET Cardiac	2	1	0	0	1	1
58/14	G0030-G0031 PET Cardiac	30	54	34	34	38	0

*Volume is reported as mean number of procedures, as identified by CPT® or HCPCS code, performed at facilities in each size category. CPT copyright by the AMA, all rights reserved.

76% said that they purchased their radiopharmaceuticals as commercially prepared single-unit doses. In-house preparation of radiopharmaceuticals was reported by 20%, and 4% reported purchasing commercially prepared multi-dose radiopharmaceuticals. While the majority of facilities did report that they purchase commercially prepared unit-dose radiopharmaceuticals, the breakdown by hospital size shows that very small and very large hospitals were more likely than moderately sized hospitals to prepare radiopharmaceuticals in house. (See Table 3.)

The survey also asked respondents to provide specific radiopharmaceutical frequency, cost, and administered dose data. Table 4 provides this detailed data. In an effort to present a simplified table, the data is not broken down by hospital size. As noted above, if less than 5 facilities reported on a radiopharmaceutical, we did not report the results. Because government agencies have put great emphasis on the cost of drugs and radiopharmaceuticals, we have decided to present both the mean and median costs.

Due to the large amount of data provided in Table 4, we will leave the detailed review and comparison to the reader. We caution readers who plan to use any of this data for benchmark purposes—carefully review the description of the radiopharmaceuticals and drugs because many of the HCPCS code descriptions changed since 2002.

We would like to make a few general observations as follows: There was little variation in the reported radiopharmaceutical doses between hospital-based and nonhospital-based facilities; we found no significant differences in the median costs for most of the radiopharmaceuticals; there were, however, differences between hospitals and nonhospitals regarding frequency. Note: Two radiopharmaceuticals were reported and analyzed in 2 sections of the survey tool. Information on both is provided.

Hospital Procedures Performed in Calendar Year 2002

The next series of data is provided for facility benchmark purposes. Among hospital nuclear medicine facilities that perform in-patient procedures, an average of 1,253 procedures were performed per facility in 2002. As noted earlier, not all facilities responded to our request for total procedure data. However, 418 respondents (83% of the hospital-based facilities) responded to the question on total number of inpatient nuclear medicine procedures performed in 2002. Hospital-based facilities averaged 2,318 outpatient nuclear medicine procedures in 2002 with a minimum of 5 and a

maximum of 25,075. Of the hospital-based facilities, 96% reported performing cardiac nuclear medicine procedures. Of the cardiac nuclear medicine procedures performed in 2002, myocardial perfusion stress tests (code 78465, MPI multiple studies stress and rest) were performed most frequently which is consistent with other reported government hospital data. Of the hospital-based facilities, 64% performed therapeutic nuclear medicine procedures. Of the hospital-based facilities, 18% performed PET nuclear medicine procedures while 93% performed other procedures. Bone scan was the most commonly performed procedure in 2002 with an average of 567, and the least common procedure was 78760–78761, Testicular Imaging. In general, for each code, the number of procedures performed increased with the hospital size. (See Table 2.)

Nonhospital Size and Operation Hours

The nonhospital data were sorted into the following categories for analysis; general nuclear medicine only, cardiac only, general nuclear medicine and cardiology, and other. The responses showed that 42% of the facilities surveyed were nonhospitals. Of these, 36% offered cardiac only, 13% offered general nuclear medicine only, 25% offered both, while 26% offered all other specialties. Additionally, nonhospitals responded that 23% were multi-specialty physician offices, and 45%, single specialty offices.

We asked the same or similar questions to the nonhospital facilities as we did to the hospitals. Regarding operational days and hours, 86% of nonhospital facilities offered routine nuclear medicine procedures 5 days a week; another 10% offered services 3–4 days per week. Of those specializing in cardiac only, 90% offered nuclear medicine services 5 days a week and 8%, 3–4 days per week.

Of nonhospital facilities, 64% were open 45 hours or less per week for routine nuclear medicine patient services. This was comparable to smaller hospitals, 65% of which reported offering nuclear medicine services 45 hours or less per week. These results suggest that for benchmark procedure volume and other cost purposes, a comparison of small hospital (0–125 beds) data would be appropriate with total nonhospital data, as the hours of operations are similar. Facilities specializing in general nuclear medicine only had the highest percentage reporting 45 hours or less (80%). Of the nonhospital facilities, 24% were open 46–55 hours per week. When asked about the average wait time for nonur-

TABLE 3
Radiopharmaceutical Preparation

	Hospital-based Facilities				All Hospitals	Nonhospitals
	0–125 Beds	126–300 Beds	301–499 Beds	500+ Beds		
Commercially Prepared Unit Dose	75%	78%	80%	55%	76%	98%
Commercially Prepared Multidose	2%	4%	4%	9%	4%	1%
Inhouse Preparation	23%	18%	16%	36%	20%	1%

TABLE 4
Radiopharmaceutical Frequency, Cost, and Dose

	Hospital-based Facilities				Nonhospital-based Facilities					
	# Facilities Reporting Frequency/Cost/Dose	Mean Frequency	Mean Cost	Median Cost	Mean Dose	# Facilities Reporting Frequency/Cost/Dose	Mean Frequency	Mean Cost	Median Cost	Mean Dose
Cardiac and Other Nuclear Medicine										
A9500 Tc 99m Sestamibi per dose	397/279/304	933	\$100.69	\$85.00	24 mCi	324/205/211	1594	\$81.16	\$80.00	25 mCi
A9502 Tc 99m Tetrofosmin per dose	270/257/280	685	\$97.69	\$86.00	24 mCi	59/56/60	754	\$90.17	\$88.18	24 mCi
A9505 Tl-201 Thallium per mCi	397/123/136	383	\$74.82	\$68.00	25 mCi	316/100/100	751	\$74.83	\$70.00	25 mCi
	400/197/219	514	\$32.87	\$23.44	4.0 mCi	321/145/150	1057	\$33.45	\$21.00	3.7 mCi
	135/136/145	816	\$35.27	\$22.50	3.7 mCi	30/24/26	1403	\$27.47	\$22.50	7.6 mCi
Q3010 Tc-99m RBC per dose	395/68/223	53	\$65.62	\$50.50	24 mCi	317/64/74	11	\$53.01	\$52.00	26 mCi
J1245 Dipyridamole per 10 mg	396/72/82	318	\$36.07	\$15.50	44 mg	317/80/28	198	\$30.96	\$19.00	44 mg
J0150 Adenosine per 6 mg	386/22/22	103	\$59.15	\$32.81	47 mg	312/75/25	90	\$102.31	\$106.00	44 mg
J0151 Adenosine per 90 mg	390/64/61	72	\$218.07	\$185.00	66 mg	321/131/108	447	\$189.14	\$188.00	60 mg
Therapeutic and Other Nuclear Medicine										
A9600 Strontium-89 Chloride per mCi	63/37/54	3	\$1416.00	\$800.00	5 mCi		NSD**			
A9605 Samarium-153 Lexidronam, 50 mCi	61/35/35	6	\$140.20	\$52.50	71 mCi		NSD			
C1064 I-131 Cap, each add mCi	177/156/145	284	\$29.70	\$14.00	20 mCi	34/24/28	66	\$36.22	\$16.89	16 mCi
C1064 I-131 Sol, each additional mCi	22/18/11	211	\$7.70	\$7.00	24 mCi		NSD			
C1188 I-131 Cap per 1-5 mCi	143/119/120	33	\$72.10	\$66.00	8.4 mCi	18/17/15	32	\$94.86	\$101.00	5.2 mCi
C1348 I-131 Sol per 1-6 mCi	23/20/15	33	\$54.30	\$51.60	15 mCi		NSD			
Q3007 Sodium Phosphate P-32 per mCi	12/9/12	25	\$281.40	\$168.80	4.5 mCi		NSD			
PET and Other Nuclear Medicine										
C1775 FDG per dose	59/50/58	251	\$35.66	\$378.00	12 mCi	20/16/19	339	\$374.21	\$375.00	14 mCi
A4642 Satumomab pentetide per dose	12/10/9	3	\$1470.45	\$1591.25	10 mCi		NSD			
A9503 Tc 99m medronate per dose	227/209/231	651	\$19.44	\$14.79	24 mCi	61/54/58	513	\$18.93	\$15.90	24 mCi
A9504 Tc 99m apcitide per dose	30/24/28	5	\$350.46	\$375.00	20 mCi		NSD			
A9507 Indium-111 Capromab pentetide per dose	26/18/22	11	\$1774.30	\$1675.00	4 mCi	7/6/7	31	\$1852.17	\$1689.50	5 mCi
A9510 Tc 99m Disofenin per dose	170/161/179	150	\$35.29	\$29.55	9 mCi	35/33/35	78	\$34.65	\$33.20	6.5 mCi
A9511 Tc 99m depreotide per mCi	19/10/20	35	\$148.06	\$36.70	18 mCi		NSD			
C1058 Tc 99m Oxidronate per vial	37/13/36	292	\$19.68	\$17.50	24 mCi		NSD			
C1066 In 111 Satumomab Pentetide per dose	31/14/12	28	\$1494.41	\$1316.00	5 mCi		NSD			
C1087 I-123 caps per 100 uCi	241/208/238	308	\$30.03	\$23.20	222 uCi	50/40/44	328	\$31.15	\$25.57	207 uCi
C1092 In-111 Pentetate, per 0.5 mCi	82/61/73	12	\$590.28	\$600.00	0.5 mCi*	6/6/6	7	\$566.92	\$575.00	3.7 mCi
C1094 Tc 99m Albumin Agg 1.0 mCi	242/205/228	361	\$12.22	\$10.00	6.8 mCi	18/15/16	53	\$122.91	\$15.45	5.3 mCi
C1095 depreotide per dose	24/16/25	26	\$678.93	\$662.50	18 mCi		NSD			
C1096 Tc 99m Exametazime per dose	73/65/67	29	\$435.23	\$410.52	20 mCi	9/8/8	73	\$455.15	\$441.30	19 mCi
C1097 Tc 99m Mebrofenin per dose	198/179/194	137	\$32.94	\$29.00	6 mCi	42/35/40	93	\$30.96	\$31.50	6.7 mCi
C1098 Tc 99m Pentetate per dose	159/147/156	96	\$24.74	\$20.00	24 mCi	23/21/23	67	\$24.78	\$22.00	20 mCi
C1122 Tc 99m Arcitumomab per dose	14/15/10	4	\$1494.53	\$1382.50	23 mCi		NSD			
Q3006, C1200 Tc 99m Glucoheptonate per dose	13/18/16	6	\$38.16	\$18.00	14 mCi		NSD			
C1201 Tc 99m Succimer per dose	29/22/26	14	\$203.00	\$216.00	3.0 mCi		NSD			
C1202 Tc 99m SC per dose	287/256/279	69	\$26.09	\$20.00	5.0 mCi*	63/48/58	39	\$22.58	\$20.43	5 mCi
Q3002 Gallium per mCi	211/178/204	55	\$24.30	\$15.91	8 mCi	42/31/35	47	\$29.78	\$18.00	8 mCi
Q3003 Tc 99m Biscate per dose	17/14/18	10	\$344.78	\$337.50	24 mCi		NSD			
Q3004 Xenon 133 per 10 mCi	138/121/135	338	\$22.87	\$18.00	15 mCi		NSD			
Q3008 Tc 99m Meritattide per dose	162/149/158	65	\$133.41	\$132.95	10 mCi*	38/32/34	36	\$141.60	\$138.13	9 mCi
Q3008 In 111 Pentetate per dose	63/55/51	21	\$1102.86	\$1105.00	5 mCi	8/9/9	7	\$1431.60	\$1350.00	5 mCi
Q3009 Tc 99m Oxidronate per dose	53/49/56	582	\$22.87	\$18.29	23 mCi	11/11/11	461	\$18.50	\$16.43	25 mCi

Note: If a radiopharmaceutical was reported in more than one section in the survey, the first reported number will be from the specialty section and the second will be from the Other Nuclear Medicine Section.

* Median data reported.

** NSD = Not Sufficient Data.

gent nuclear medicine procedures in nuclear cardiology procedures, 44% of the nonhospital facilities reported an average wait time of 2 days or less. For all other nuclear medicine procedures, 23% reported a wait time of 2 days or less.

Nonhospital Purchasing Practices

Regarding purchasing practices, 27% of the nonhospital nuclear medicine facilities planned on upgrading or purchasing nuclear medicine equipment next year, and 31% of the cardiac-only facilities planned on upgrading. Both of these percentages were lower than reported by hospitals. However, similar to hospitals, for those who were planning an upgrade, a very high percentage (91%) were upgrading to SPECT equipment, and, interestingly, 4% of nonhospitals reported plans to upgrade to PET/CT, higher than reported by hospitals.

Another interesting significant difference was identified by the survey regarding radiopharmaceutical purchase method. In contrast to hospitals, on average, 98% of nonhospital facilities said that their radiopharmaceuticals were commercially prepared unit dose, much higher than the hospital average of 76%, reported earlier. The remaining nonhospitals were equally split between commercially prepared multi-dose and in-house preparation. (See Table 3.)

Nonhospital Procedures Performed in Calendar Year 2002

The average number of outpatient nuclear medicine procedures performed in nonhospital facilities was 2,093. The percentage of respondents to this question was 84%. Facilities that performed cardiac nuclear medicine averaged 1,279 SPECT myocardial perfusion imaging multiple procedures annually. Only 12% of nonhospital facilities performed therapeutic nuclear medicine procedures in 2002, significantly lower than hospitals at 64%. PET procedures were performed in 7% of nonhospital facilities compared to 18% of hospitals. Of the nonhospital facilities, 90% performed cardiac nuclear medicine procedures in 2002, compared with 96% of hospitals. In general, the most frequently performed procedures were cardiac and musculoskeletal.

This survey was quite comprehensive, and we were pleased that so many technologists were willing to expend the considerable time that it took to complete it. It is clear there are both similarities and differences between nuclear medicine as practiced in hospital-based and nonhospital-based facilities; therefore, measurements at this level of detail are recommended for future surveys. We plan to repeat many aspects of this survey in the future. This survey will provide a basis for future comparisons, will help us understand trends, and will assist us in planning for the future of nuclear medicine.

