

Navy Specialty Physician Study: Historical Overview, Retention Analysis, and Synopsis of Current Civilian-Sector Practices

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Summary

Introduction

The Bureau of Medicine and Surgery (BUMED) continually strives to better meet its workforce objectives through improved business practices. The personnel planning process for Navy health care professionals is a complex and important business practice. Navy Medicine wants to systematically monitor indices to assess whether its personnel plans and policies are achieving their desired objectives in attaining and retaining the medical department officer inventory desired with respect to diversity, quality, and years of experience.

Earlier analyses conducted by the Center for Naval Analyses (CNA) indicated that Navy physician retention may be declining for some specialties but also that the available index to measure the extent and cause of this decline was weak [1-3].¹ In addition, many perceptions about the current “state of the medical corps” may not be fully grounded in data. Based on CNA’s findings and recommendations and the possibility that some misperceptions may exist, the Navy Surgeon General asked CNA to further explore retention and to develop indices—*critical indicators*—to monitor the status of Navy physician specialties.

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1. In previous CNA work, we were able to compute the retention rates only for the “total pool of un-obligated physician specialties” because of data and time limitations [1]. The analysis indicated that retention may be declining for several physician specialties, but we also noted that this retention indicator was weak because it overemphasizes those specialists who may not specifically be committed to staying in the Navy. We stated that the best index to measure retention was at the “end of initial active duty obligation,” which measures, in general terms, a uniformed specialist’s behavior at the first opportunity to leave the military. By meticulously scrubbing the BUMIS data, we were able to quantify this index in this study for the majority of Navy physician specialists.

Approach

To address the Navy Surgeon General's concerns, we conducted a three-part analysis of Navy physician specialties based on BUMED's (MED-52) historical personnel tapes:

1. We identified and tracked some critical indicators to help BUMED assess notable personnel trends within each of its major physician specialties.² We also compared these trends with civilian data, when available, to determine whether a given trend is unique to Navy physicians.
2. We closely examined (a) the retention of Navy medical officers by evaluating accessions from the Armed Forces Health Professions Scholarship Program (AFHPSP) (direct and full deferment) and the Uniformed Services University of the Health Sciences (USUHS) and (b) the attrition rate out of the pool of specialists. We closely examined these two aspects because we want to thoroughly explore the first stay-leave military decision for Navy physicians.
3. We begin exploring some of the physician recruitment and retention strategies being used in the civilian sector. These trends will enable uniformed policy-makers to better understand their potential competition and to strengthen their marketing campaigns by illuminating areas where the military's attractive features may predominate the civilian sector's.

Findings and recommendations

Findings

First, our analysis and tracking of critical indicators for Navy physician specialties show the following major trends:

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2. We specifically do *not* address billet-to-body ratios in this study because subject matter experts from BUMED and BUPERS work together to create the Navy Medical Corps "world book" that we feel reasonably captures historical and projected specialty manning.

- Overall, the Navy medical corps became 3 percent smaller over the last decade, while the number of fully trained duty specialists increased by 16 percent. This trend occurred while the number of physicians placed in the active duty graduate medical education (GME) training pipeline declined by 35 percent. The reduction in GME might impede the Navy's ability to fill billets in the future (depending on how the number of billets changes over time).
- In both the Navy and the civilian sector, the average age of specialists has risen over time, and the percentage of female specialists has increased. The ethnic diversity of Navy specialists also has increased over time.
- The mix of specialists in both the Navy and the civilian sector has changed from the late 1980s. Specifically, the percentage of specialists in primary care specialties has increased, and the percentage in surgical specialties has decreased; this occurred in both the Navy and the civilian sector.
- The percentage of board-certified specialists in primary care and other specialties is about the same in the Navy as in the civilian sector. The percentage of board-certified specialists in surgical specialties, however, is 21 to 30 percentage points higher in the civilian sector than in the Navy.

Second, our analysis of retention patterns of new accessions and fully trained duty specialists shows that retention patterns are substantially different since the April 1988 change in the obligation policy associated with GME training. Specifically, we found the following:

- The percentage of AFHPSP direct accessions that eventually became residents (and by definition specialists) is about 14 percentage points lower after FY 1988 than before it.
- Cumulative retention of fully trained duty specialists 2 years after completion of their initial active duty obligation is 7 percentage points higher since April 1988.

Combining increased attrition before residency and reduced attrition after it may explain why overall attrition rates are largely unchanged since FY 1987.

Finally, our review of the literature on civilian-sector practices for GME, physician recruitment, and physician retention has found the following:

- In general, compensation in civilian residency programs is the same across the country because most programs set residency stipends by the number of completed graduate years regardless of specialty. Residency hours vary widely, however, depending on specialty, hospital, and hospital department. Navy physicians are better compensated than their civilian counterparts during residency.
- Recruitment of a new physician usually takes about 9 to 12 months in urban areas and up to 3 years or more in rural areas.
- Most practitioners recruit locally where physicians were residents or at teaching hospitals near their offices. In turn, it is not unusual for residents to locate their new practices close to where they completed their residency programs.
- Salary with bonus potential and guarantees are the preferred methods of structuring a physician's income. Additional incentives may include relocation allowances, paying for continuing medical education fees, health insurance, malpractice insurance, disability insurance, educational loan forgiveness, and signing bonuses.
- Physician turnover is about 10 percent for medical groups. Other than retirement, the two reasons cited most often for a physician to leave a practice are not getting along with colleagues and a family member not adapting to the community.

Recommendations

Given our findings, we make the following recommendations.

First, the Navy needs to continue to strengthen its personnel planning process by improving the quality of its BUMIS data and by tracking the retention of its specialists at critical stay-leave military decision points. Moreover, the long-term impact of reducing residency and fellowship opportunities for some specialties must be assessed because

manning difficulties may not, by default, be a retention problem but simply an insufficient number of physicians being accessed into the training pipeline.

For instance, a 4-year AFHPSP direct accession who spends 1 year as an intern, 2 years as a Primary Care Medical Officer (PCMO), and 4 years as a resident will have 7 years of service by the time he/she is a fully trained specialist. Hence, inability to fill billets, may very well have been an accession problem 7 years ago (11 if you consider the 4 years as a medical student). Because of the time it takes to "grow" a specialist in-house, the personnel planning process needs to ensure that the number of physicians in the pipeline is sufficient to meet the Navy's needs.

Second, in conducting this analysis, we did not investigate the question of whether the Navy's physician retention rate is "good" or "bad." We strongly recommend that a study be conducted to determine *required retention rates*, by specialty. This study would include an in-depth analysis of specialty attrition rates and a rigorous assessment of the total life-cycle cost of physician accessions to determine the most effective and economical means for the Navy to fill its specialty billets. Moreover, this study would weigh the cost of accessions with the cost of increasing retention by paying higher wages.

Third, we recommend that a study be conducted (in conjunction with the "required" retention rates study) to examine how life-cycle costs vary by accession source. Clearly, retention patterns vary significantly by accession source as does the investment made in physicians from each accession source. For instance, USUHS accessions have higher retention than fully deferred AFHPSP, but they also require a much bigger investment. This study should compare the cost of meeting the desired experience profile of the medical corps through different accession sources to find the optimal accession source mix.

Overview of Navy specialists

This section outlines and tracks some critical indicators to help assess notable trends in the major physician specialties. In addition to tracking data trends, we compare these trends to civilian-sector data (when available) so that BUMED can see whether what we observed was unique to the Navy. The tables in appendix A provide details on much of the information in this section. They present Navy physician data for each specialty and for all specialty groups combined.

By monitoring trends in these data for each specialty, and across specialty groups, BUMED can better assess the status of its personnel data and subsequently improve the quality of its personnel planning process. Moreover, by systematically monitoring these critical indicators, policy-makers and Specialty Leaders will better understand where they've been, and where they are, before deciding on future courses of action.

We remind the reader that *this analysis is intended to identify personnel data trends* based on the BUMIS (MED-52) data. Our intent is to help policy-makers better understand the behavior of its inventory—based on its personnel data fields and policies—regarding retention, years of experience, grade and age distributions, and gender mix. It is beyond the scope of this study to assess whether these trends are favorable or unfavorable. These factors are not a function of the billet file.

Certainly, we realize that the medical corps billet file is the primary determinant of the number of physicians in the Navy Medical Corps inventory and training outputs. The billet file represents the “target” for how many active duty specialists the Navy wishes to have in a given fiscal year. Many factors can affect the billet file (and ultimately the inventory and training outputs), such as the downsizing of the direct care system as a result of the reduction in the number of military medical centers, hospitals, and clinics due to Base Realignment and Closure (BRAC) and the general downsizing of the military. These

factors can potentially explain decreasing (or increasing) inventories and training outputs even if retention is constant.

Also, a reduction in inventory is not necessarily bad or good; that depends on the medical corps' ability to meet its workforce objectives by filling its billets and meeting its readiness requirements. In short, a downward (or upward) trend in inventory may simply be a correction reflecting changes in billet file requirements. By importing this analysis into BUMED's existing understanding of its billet file, Navy Medicine will be able to better understand where it has been and chart a more exact personnel-planning course to meet its workforce objectives.

Critical indicators

The personnel planning process for military physicians involves many factors. Chief among these is the size of the overall accession pipeline and the pipelines for individual specialties. Even "optimal" retention would not be a sufficient condition to guarantee that the Navy would fill its billets because it might not have enough physicians in the pipeline or in the right place in the pipeline.

Other critical factors affecting the Navy's ability to fill billets are the demographics of its medical officers. If retention rates vary significantly by demographic characteristics, changes in these characteristics signal a change in retention rates and, by definition, a change in the Navy's ability to fill billets.³

Force structure

We begin our analysis of these critical indicators by looking at the force structure—how many and what duty status.⁴

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3. For example, retention patterns vary significantly by accession source and by years or service [3-5].
 4. This analysis is based on how Navy physicians were coded within the MED-52 BUMIS database by subspecialty code, AQD, and CNOBC.

Inventory

The inventory of the Navy medical corps between FY 1987 and FY 2000 has had as many as 4,369 physicians and as few as 3,928 (see table 1). Since its peak in FY 1993, the number of Navy physicians has trended downward 7 percent from 4,369 to 4,059 physicians in FY 2000, but the percentage drawdown by duty status was not the same for all duty types.

Table 1. Navy medical corps inventory by duty status (FY87-00)^a

Duty status	Fiscal year													
	87	88	89	90	91	92	93	94	95	96	97	98	99	00
PGY-1 ^b	258	254	274	299	307	351	318	308	285	238	256	257	261	249
PCMOs ^c	1,056	1,051	987	934	1,008	984	1,029	1,013	960	939	864	865	846	870
PGY-2+ ^d	800	834	913	1,010	958	942	854	836	833	779	732	695	720	661
Specialists	1,655	1,682	1,775	1,841	1,966	1,967	2,059	2,023	1,969	1,979	2,011	2,059	2,104	2,134
Exec. med	108	102	103	104	116	110	107	109	115	162	148	150	145	139
Other ^e	20	5	6	6	5	3	2	2	2	2	4	6	5	6
Total	3,897	3,928	4,058	4,194	4,360	4,357	4,369	4,291	4,164	4,099	4,015	4,032	4,081	4,059

a. Unless stated otherwise, the numbers in this analysis are from the BUMIS (MED-52) personnel tapes.

b. PGY-1 are interns.

c. PCMOs include flight surgeons, undersea medicine, general PCMOs, etc.

d. PGY-2+ are residents and fellows.

e. Includes all individuals associated with hyperbaric medicine.

For example, the number of medical officers serving a PGY-1 (intern) year fell from 351 in FY 1992 to 249 in FY 2000—a 29-percent decrease. Similarly, the number of PCMOs decreased 15 percent between FY 1993 and FY 2000. And residents and fellows (PGY-2+) had the biggest percentage drop—35 percent between FY 1990 and FY 2000. While the number of interns, PCMOs, and residents and fellows decreased, the number of specialists and executive medicine officers increased. Specifically, the number of specialists and executive medical officers each increased 29 percent between FY 1987 and FY 2000.

We infer from these trends that the Navy's *overall ability* to fill billets (with fully trained specialists) has increased over this period, despite the drawdown in the overall inventory of Navy medical officers.

Because of manning difficulties within individual specialties, however, one must exercise caution when interpreting these data. Keep in mind that the Navy accesses some of its specialists via “deferred” AFHPSP, Financial Assistance Program (FAP), and direct procurement/recall programs. We also infer that the Navy’s future ability to fill certain specialty billets may be impeded because the number of physicians in the training pipeline is significantly lower than it was a decade ago.⁵

We show in table 2 the inventory of duty specialists and the number of residents and fellows in the pipeline to become specialists for both FY 1990 and FY 2000. For physicians in all specialties combined, inventory during the decade has increased 16 percent from 1,841 to 2,134 specialists. This is in stark contrast to the decrease in the number of residents and fellows in the pipeline to become specialists, which fell 35 percent from 1,010 to 661 over the same period.

In addition, the inventory of specialists in every major specialty group increased between FY 1990 and FY 2000 by at least 2 percent, yet the number of residents and fellows in those specialty groups decreased at least 30 percent. Specifically, there were 200 more primary care specialists in FY 2000 than in FY 1990. This increase occurred almost entirely because of the increase of 178 specialists in family practice. Similarly, the increase of 83 specialists in other specialties is principally a result of an increase of 70 emergency medicine physicians between FY 1990 and FY 2000.

Looking at individual specialties, we see that the number of residents and fellows fell or remained unchanged between FY 1990 and FY 2000 in all but 2 of the 23 specialists we examined—emergency medicine and physical medicine. The number of emergency medicine residents and fellows increased 9 percent from 44 to 48 over this period; however, this increase is small compared to the 163-percent increase (from 43 to 113) in the inventory of fully trained emergency medicine physicians. Similarly, the number of emergency medicine physicians in the civilian sector increased about 70 percent between 1988 and 1999. Physical medicine residents increased from 0 to 6 between

5. This also depends on how the number of billets changes over time.

FY 1990 and FY 2000, while the inventory of fully trained physical medicine physicians increased from 3 to 4. (Given the small number of physical medicine physicians in the Navy, annual changes don't necessarily represent long-term trends.)

Table 2. Change in Navy duty specialists and residents/fellows between FY90 and FY00

Specialty group	Duty specialists				Residents and fellows			
	FY90	FY00	Change	Percent change	FY90	FY00	Change	Percent change
All specialties	1,841	2,134	293	16	1,010	661	-349	-35
Primary care	714	914	200	28	342	240	-102	-30
Family practice	224	402	178	79	96	76	-20	-21
Internal medicine (IM)	120	116	-4	-3	70	53	-17	-24
IM subspecialties	157	155	-2	-1	94	43	-51	-54
Pediatrics	160	175	15	9	54	53	-1	-2
PM/Occ. medicine	53	66	13	25	28	15	-13	-46
Surgical	552	562	10	2	314	196	-118	-38
General surgery (GS)	148	104	-44	-30	61	40	-21	-34
GS subspecialties	32	55	23	72	11	8	-3	-27
Neurological surgery	20	11	-9	-45	7	7	0	0
OB/GYN	101	138	37	37	75	35	-40	-53
Ophthalmology	61	64	3	5	27	10	-17	-63
Orthopedic surgery	98	109	11	11	62	49	-13	-21
Otolaryngology	53	47	-6	-11	46	28	-18	-39
Urology	39	34	-5	-13	25	19	-6	-24
Other	575	658	83	14	354	225	-129	-36
Aerospace medicine	26	65	39	150	16	16	0	0
Anesthesiology	138	122	-16	-12	83	38	-45	-54
Dermatology	38	42	4	11	33	18	-15	-45
Emergency medicine	43	113	70	163	44	48	4	9
Neurology	29	31	2	7	9	6	-3	-33
Nuclear medicine	11	8	-3	-27	2	0	-2	-100
Pathology	87	83	-4	-5	38	15	-23	-61
Physical medicine	3	4	1	33	0	6	6	undefined
Psychiatry	99	97	-2	-2	51	27	-24	-47
Radiology	101	93	-8	-8	78	51	-27	-35

For many of the other specialties, we observe an increase in the inventory of specialists and a decrease in the number of residents and fellows. For example, the inventory for family practice increased 79 percent between FY 1990 and FY 2000 from 224 to 402, while the number of family practice residents and fellows fell 21 percent from 96 to 76. In the civilian sector, the number of family practitioners increased 54 percent between 1988 and 1999. Similarly, the inventory of OB/GYNs increased 37 percent from 101 to 138, and the number of residents and fellows decreased 53 percent from 75 to 35 over the same period.

We also observe that many specialties, such as anesthesiology and radiology, had declines in inventory between FY 1990 and FY 2000, but these declines were not as great as the declines in their training pipelines. Specifically, anesthesiology inventory fell 12 percent, while its resident and fellow pool fell 54 percent. Similarly, the radiology inventory pool and the resident and fellow pool fell 8 and 35 percent, respectively.

Distribution by specialty

Table 3 shows Navy specialists in each specialty as a percentage of all specialists for FY 1987 and FY 2000. Although the distribution by specialty group—primary care, surgical, and other specialties—has changed little between these fiscal years, there were substantial changes in the percentage of specialists accounted for by individual specialties.

The number of family practitioners in the Navy increased from 202 in FY 1987 to 402 in FY 2000. These family practitioners represented 18.8 percent of Navy specialists in FY 2000 compared to 12.2 percent in FY 1987. Similarly, the number of emergency medicine physicians grew 319 percent from 27 physicians in FY 1987 to 113 in FY 2000. Given this growth, emergency medicine physicians represented 5.3 percent of all physicians in FY 2000 compared to only 1.6 percent in FY 1987.

There have also been striking changes in the percentage of Navy specialists accounted for by aerospace medicine and internal medicine specialists. In FY 1987, 23 aerospace medicine physicians constituted

1.4 percent of all Navy specialists. By FY 2000, there were 65 of these specialists, representing 3.0 percent of all Navy specialists. Of course, not all specialties' inventories have grown; in fact, several have declined. Internal medicine, for example, fell from 151 to 116 specialists between FY 1987 and FY 2000. Although these specialists accounted for 9.1 percent of all Navy specialists in FY 1987, they accounted for only 5.4 percent in FY 2000.

Table 3. Distribution of Navy and civilian specialists by specialty (FY87 and FY00)

Specialty group	Percent of all Navy specialists		Diff.	Percent change	Percent of all civilian-sector specialists ^a		Diff.	Percent change
	FY87	FY00			1988	1999		
Primary care	41.3	42.8	1.5	4	44.1	48.2	4.1	9
Family practice	12.2	18.8	6.6	54	9.3	10.8	1.5	16
Internal medicine (IM)	9.1	5.4	-3.7	-41	19.5	20.1	0.6	3
IM subspecialties	7.3	7.3	0.0	0	6.3	6.6	0.3	5
Pediatrics	10.9	8.2	-2.7	-25	8.2	9.5	1.3	16
Preventive/occupational medicine	1.7	3.1	1.4	82	0.8	1.0	0.2	25
Surgical	28.9	26.3	-2.6	-9	27.3	23.3	-4.0	-15
General surgery (GS)	6.0	4.9	-1.1	-18	7.8	6.2	-1.6	-21
GS subspecialties	2.1	2.6	0.5	24	1.5	1.1	-0.4	-27
Neurological surgery	0.7	0.5	-0.2	-29	0.9	0.8	-0.1	-11
OB/GYN	6.4	6.5	0.1	2	6.7	6.2	-0.5	-7
Ophthalmology	3.1	3.0	-0.1	-3	3.2	2.8	-0.4	-13
Orthopedic surgery	5.8	5.1	-0.7	-12	3.8	3.4	-0.4	-11
Otolaryngology	2.7	2.2	-0.5	-19	1.6	1.4	-0.2	-13
Urology	2.2	1.6	-0.6	-27	1.9	1.6	-0.3	-16
Other	29.8	30.8	1.0	3	28.6	28.5	-0.1	-0
Aerospace medicine	1.4	3.0	1.6	114	0.1	0.1	0.0	0
Anesthesiology	6.8	5.7	-1.1	-16	5.0	5.4	0.4	8
Dermatology	2.4	2.0	-0.4	-17	1.5	1.5	0.0	0
Emergency medicine	1.6	5.3	3.7	231	2.7	3.4	0.7	26
Neurology	1.5	1.5	0.0	0	1.8	1.8	0.0	0
Nuclear medicine	0.7	0.4	-0.3	-43	0.3	0.2	-0.1	-33
Pathology	4.5	3.9	-0.6	-13	3.4	2.9	-0.5	-15
Physical medicine	0.2	0.0	0.0	0	0.8	1.0	0.2	25
Psychiatry	5.3	4.5	-0.8	-15	7.8	7.0	-0.8	-10
Radiology	5.5	4.4	-1.1	-2	5.3	5.1	-0.2	-4

a. Civilian-sector data from the American Medical Association are for calendar, not fiscal, years [6].

Comparing the distribution of Navy specialists to civilian-sector specialists shows that the overall distribution by specialty in the Navy is similar to that of the civilian sector. In the Navy in FY 2000, 43, 26, and 31 percent of specialists were in primary care, surgical, and other specialties, respectively. Similarly, in the civilian sector in 1999, primary care, surgical, and other specialties accounted for 48, 23, and 29 percent of specialists, respectively. Also, both the Navy and civilian sector now have a higher percentage of primary care specialists and a lower percentage of surgical specialists than they did previously. This change in the specialty mix, in both the Navy and the civilian sector, appears to be a direct result of the national movement toward managed care.

As in the Navy, the percentage of the civilian-sector distribution composed of family practitioners, preventive/occupational medicine, and emergency medicine physicians increased between 1989 and 1999. But, unlike the Navy, anesthesiology, internal medicine, and pediatric specialties increased in the civilian sector over this period.

Demographics

Age

Table 4 shows the average age of the Navy medical corps between FY 1987 and FY 2000, which increased from 37.7 to 40.2 years over this period (a 7-percent increase). When we stratified Navy physicians into primary care, surgical, or other specialties, the average age of each group still increased by about 7 percent. Hence, the aging of Navy specialists is fairly consistent across the specialties and is not confined to a select few.

Table 4. Average age of Navy duty specialists (FY87 and FY00)

Specialty group	Average age		Percent change
	FY87	FY00	
Primary care	36.8	39.2	7
Surgical	38.0	40.6	7
Other	38.8	41.4	7
All specialties	37.7	40.2	7

The aging of the specialist population does not appear to be a phenomenon unique to the Navy. As table 5 shows, the distribution of civilian-sector specialists has also become more heavily weighted to

the older age groups. For example, civilian-sector physicians under 35 years of age accounted for 26 percent of physicians in 1989 compared to only 17 percent in 1999. At the same time, those between 45 and 54 increased from 20 to 28 percent. Overall, those under age 45 accounted for 59 percent of civilian physicians in 1989 compared to 46 percent in 1999.⁶

Table 5. Age distribution of civilian-sector specialists (1989 and 1999)^a

Age group	Percent in age group		Percent change
	1989	1999	
Under 35	26	17	-9
35-44	33	29	-4
45-54	20	28	+8
55-64	14	15	+1
65 and over	8	11	+3

a. Civilian data are from the American Medical Association [6].

Gender

Table 6 shows that the gender mix of the Navy medical corps remained fairly stable between FY 1987 and FY 1994, ranging between 88 and 90 percent male. Since that time, however, the percentage has steadily declined to 79 percent male in FY 2000. This trend is consistent with previous CNA analysis, which finds that more women are entering health care professions [2, 3]. We also observe approximately this same pattern in each of the three specialty groups (primary care, surgical, and other specialties).

Table 6. Percentage of specialists who are male (FY87-00)

Group	Fiscal year													
	87	88	89	90	91	92	93	94	95	96	97	98	99	00
All Navy specialists	88	88	88	89	90	90	90	89	87	85	84	83	81	79
Primary care	86	85	86	87	88	87	87	85	82	80	79	79	76	75
Surgical spec.	89	90	87	88	90	90	90	89	89	87	87	87	85	84
Other spec.	91	91	94	93	93	94	94	92	90	88	87	84	83	81
Civilian specialists ^a	N/A	85	85	83	N/A	81	81	80	78	78	77	77	76	N/A

a. Civilian-sector data from the American Medical Association are for calendar, not fiscal, years [6].

6. Civilian figures are based on physicians in the 23 specialties we used to examine Navy physicians.

The percentage of the Navy medical corps that was male was highest between FY 1991 and FY 1993 for the corps as a whole and also for each specialty group. Other specialties had the highest percentage of males (94 percent) of the three specialty groups in FY 1993, but, by FY 2000, surgical specialties had the highest percentage of males (84 percent).

We observe similar changes in the civilian sector. Males accounted for 85 percent of civilian physicians in 1988 compared to 76 percent in 1999. Comparing the percentage of males among Navy and civilian physicians, we see that, in FY 1988, they accounted for 88 percent of physicians in the Navy and 85 percent of those in the civilian sector. Similarly, in FY 1999, males accounted for 81 and 76 percent of Navy and civilian physicians, respectively. In fact, a higher percentage of Navy specialists than civilian-sector specialists were male for every year for which we have data. Despite this change in the gender mix over time, there is no evidence that retention is significantly different between males and females [3].

Ethnicity

Although it is difficult to determine (because of the varying percentage of specialists for whom ethnicity is known), it appears that the ethnic mix of the Navy medical corps was roughly the same between FY 1987 and FY 2000 (see table 7). If there has been any change, it is a slight increase in the percentage of specialists who are minorities. Specifically, minorities accounted for 7 percent of Navy specialists in FY 1989 and 9 percent in FY 1999. (In both of these fiscal years, those of unknown ethnicity accounted for only 9 percent of specialists, versus 22 and 10 percent for FY 1987 and FY 2000, respectively.)

Even if the percentage of minorities hasn't changed or has changed very little, the mix of the ethnic groups has changed. Specifically, Asians accounted for 2 percent in FY 1989 compared to 4 percent in FY 2000. The increase in Asian specialists was partially offset by a decrease in the percentage of specialists of other ethnicities, which accounted for 3 percent in FY 1989, but only 2 percent in FY 2000. Blacks also increased from 2 to 3 percent over this same period.

Table 7. Ethnic mix of Navy specialists in percent (FY87-00)

Ethnicity	Fiscal year													
	87	88	89	90	91	92	93	94	95	96	97	98	99	00
Caucasian	71	78	84	83	80	80	82	84	90	89	88	85	82	81
Black	2	2	2	2	2	2	2	2	3	3	3	3	3	3
Asian	2	2	2	2	2	2	2	2	3	3	3	3	4	4
Other	3	4	3	3	3	3	3	3	3	2	2	2	2	2
Unknown	22	15	9	9	13	12	11	9	2	2	4	7	9	10

Marital status and dependents

The percentage of fully trained duty specialists who were married (not to active duty spouses) remained fairly stable between FY 1987 and FY 1997, ranging between 75 and 79 percent. However, the percentage of those married to active duty (AD) spouses increased from 6 to 8 percent over the same period. Overall, the percentage married ranged between 83 and 85 percent of all specialists, and single personnel accounted for 14 to 16 percent of specialists between FY 1987 and FY 1997.⁷

The number of dependents averaged two for married specialists not married to AD spouses, one for those married to AD spouses, and zero for single specialists. The number of dependents for each group was the same in each year between FY 1987 and FY 2000.

Tracking trends in marital status is an important issue for the Navy because permanent change in station, moves, or deployment and the potential effects of family stability and career path are common concerns of Navy physicians [1]. In addition, these are not issues faced by civilian sector physicians. As a consequence, we reiterate the conclusion of previous CNA research that further examination is necessary to determine "how to best develop career paths that meet the needs of the service while minimizing disruption to families" [1].

7. Although we have data for FY 1998 through FY 2000, it is difficult to use these data to assess marital status trends because of records with missing marital status information.

Paygrade

The paygrade distribution of all Navy specialists changed little between FY 1987 and FY 2000. In FY 2000, O-3s, O-4s, O-5s, and O-6s accounted for 17, 28, 39, and 16 percent, respectively. These percentages are roughly the same as in FY 1987 when they were 17, 25, 43, and 15 percent for O-3s, O-4s, O-5s, and O-6s, respectively. However, it is not true that the paygrade distribution of all individual specialties remained the same over this period.

For example, O-6s accounted for 78 percent of aerospace medicine specialists in FY 1987, but only 40 percent in FY 2000. Similarly, O-3s and O-5s accounted for 33 and 22 percent of emergency medicine physicians in FY 1987, respectively, compared to 12 and 32 percent in FY 2000.

Years of practice (YOP) in specialty

The average YOP that duty Navy specialists had been in their respective specialties ranged from 5.5 to 6.7 years between FY 1987 and FY 2000. We see substantial yearly variation in the average YOP of individual specialties. Given the small sample sizes in many specialties, the retirement of a small number of experienced specialists or the acquisition of an especially large or small group of new specialists could easily affect the average YOP in the specialty.

Board certification

Table 8 compared the percentage of Navy specialists—board certified in their specialty—to the percentage of board-certified civilian-sector specialists.

The first observation to make from this table is that, in all cases, the percentage of board-certified civilian specialists is higher than the percentage in the Navy. That said, we recognize that our estimates of the percentage certified in the Navy are downward biased because a physician may be board certified in internal medicine but not in the internal medicine subspecialty in which he/she is currently practicing. Moreover, because many uniformed physician specialists opt to leave the service before having the chance to become board certified,

one would expect the Navy's board certification rate to be lower than that experienced in the civilian sector.

Table 8. Percentage of Navy and civilian specialists who are board certified (FY87-00)

Speciality group	Fiscal year													
	87	88	89	90	91	92	93	94	95	96	97	98	99	00
All specialties														
Navy	54	54	56	56	54	55	56	56	55	56	57	58	55	57
Civilian ^a	N/A	N/A	63	N/A	N/A	65	65	66	67	68	66	65	72	N/A
Primary care														
Navy	58	59	62	61	60	64	62	60	60	61	62	65	62	62
Civilian	N/A	N/A	62	N/A	N/A	64	65	66	67	68	66	63	73	N/A
Surgical														
Navy	45	42	44	45	44	44	43	43	44	46	47	43	42	45
Civilian	N/A	N/A	65	N/A	N/A	67	66	69	68	69	68	67	72	N/A
Other														
Navy	56	58	60	60	55	55	60	62	59	60	59	61	60	59
Civilian	N/A	N/A	62	N/A	N/A	64	63	65	65	67	66	65	70	N/A

a. Civilian-sector data from the American Medical Association are for calendar, not fiscal, years [6].

Despite the downward bias, the percentages of specialties that are board certified in primary care and other specialties are similar across the Navy and the civilian sector. The percentage board certified in surgical specialties, however, is between 21 and 30 percentage points higher in the civilian sector than in the Navy. Again, this is probably a good indication that many surgical specialists leave the Navy after attaining board certification.

Findings

Given this overview of critical indicators for all specialists, we now highlight some of the significant trends in each specialty. As previously stated, our purpose is simply to identify trends; we don't draw conclusions as to whether these trends are favorable or unfavorable. Appendix A summarizes all duty specialists and contains a detailed table for each specialty outlining the force inventory, the number of physicians in training pipeline, and various demographic characteristics from FY 1987 through FY 2000. These tables also compare the

demographics of Navy specialists and civilian-sector specialists when civilian data are available.

Aerospace medicine

The major trends in aerospace medicine (AM) are the following:

- The inventory of AM specialists increased 183 percent from 23 to 65 between FY 1987 and FY 2000. This inventory change resulted in AM specialists accounting for 3.0 percent of all duty specialists in FY 2000 compared to 1.4 percent in FY 1987. In contrast, the civilian-sector inventory of AM specialists decreased 29 percent between 1988 and 1999.
- Between FY 1987 and FY 2000, the number of residents ranged between 12 and 17, with the exception of FY 1998 and FY 1999 when additional inventory was channelled into residencies.
- The paygrade distribution changed substantially from 22 percent O-5s and 78 percent O-6s in FY 1987 to 11, 14, 35, and 40 percent for O-3s, O-4s, O-5s, and O-6s, respectively, in FY 2000.

Anesthesiology

The major trends in anesthesiology follow:

- The inventory of anesthesiologists declined from 181 in FY 1993 to 122 in FY 2000; in the civilian sector, the inventory increased 43 percent between 1988 and 1999. The number of active duty residents and fellows also declined from 83 in FY 1990 to 38 in FY 2000.
- The average age of Navy anesthesiologists rose from 35.2 to 39.0 years between FY 1987 and FY 2000. At the same time, the average YOP in specialty rose from 3.5 to 5.0.
- The paygrade distribution has fluctuated somewhat over time, but in FY 2000 it was more heavily weighted to O-5s and O-6s (35 percent) than it was in FY 1987 (17 percent).

Dermatology

The major trends in dermatology are as follows:

- The inventory of dermatology specialists between FY 1987 and FY 2000 changed little (39 to 42), but the number of active duty residents and fellows declined from 33 to 18 between FY 1990 and FY 2000. In the civilian sector, the number of dermatologists rose 34 percent between 1988 and 1999.
- The average age of these specialists rose from 39.0 to 42.4 between FY 1987 and FY 2000; the percentage of males fell from 90 to 79 percent over the same period.

Emergency medicine

The major trends in emergency medicine (EM) are the following:

- The inventory of EM physicians increased 163 percent from 43 specialists in FY 1990 to 113 in FY 2000. Over the same period, the number of active duty EM residents and fellows ranged between 43 and 52. The number of civilian-sector, EM specialists also rose (70 percent between 1988 and 1999).
- In FY 2000, EM physicians accounted for 5.3 percent of specialists, compared to only 1.6 percent in FY 1987.
- The average age of EM physicians increased from 34.7 to 38.9 years between FY 1987 and FY 2000.

Family practice

The major trends in family practice (FP) are the following:

- The inventory of FP physicians increased from 224 to 402 between FY 1990 and FY 2000, while the number of active duty FP residents and fellows fell from 96 to 76. The inventory in the civilian sector FP physicians also increased substantially—54 percent between 1988 and 1999.
- The distribution of Navy specialists consisted of 18.8 percent FP physicians in FY 2000 compared to 12.2 percent in FY 1987.

- The average age of these specialists rose from 35.7 to 38.3 over the same period.

General surgery

The major trends in general surgery follow:

- The inventory of general surgeons fell from 161 in FY 1992 to 104 in FY 2000. In contrast, the civilian-sector inventory rose 4 percent between 1988 and 1999. Also, the number of active duty residents fell from 61 to 40 between FY 1990 and FY 2000.
- General surgeons represented 8.2 percent of all specialists in FY 1992 compared to 4.9 percent in FY 2000.
- The percentage of general surgeons who are male decreased from 96 to 84 percent between FY 1987 and FY 2000.

General surgery subspecialties

We found three major trends in general surgery (GS) subspecialties:

- The inventory of GS subspecialists rose from 32 to 55 between FY 1990 and FY 2000. In contrast, the civilian-sector inventory of GS subspecialists fell 1 percent between 1988 and 1999. Also, the number of active duty GS fellows fell from 15 to 8 between FY 1993 and FY 2000.
- The average YOP for GS subspecialties rose from 3.8 to 8.1 years between FY 1987 and FY 2000. At the same time, the YOP in the primary specialty rose from 6.2 to 11.5 years.
- Over this same period, the percent male decreased and the pay-grade distribution was more heavily weighted to O-5s and O-6s in FY 2000 (83 percent) than it was in FY 1987 (54 percent).

Internal medicine

The major trends in internal medicine (IM) are the following:

- Between FY 1987 and FY 2000, the inventory of IM specialists fell from 151 to 116, while the number of active duty IM

residents fell from 65 to 53. In the civilian sector, however, the IM inventory increased 36 percent between 1988 and 1999.

- IM specialists went from representing 9.1 percent of all specialists in FY 1987 to only 5.4 percent of all specialists in FY 2000.
- The percent male fell from 83 to 68 percent over this same period.

Internal medicine subspecialties

We found four major trends in IM subspecialties:

- The inventory of IM subspecialists fell from 230 to 155 between FY 1993 and FY 2000. This reduction took them from representing 11.2 to 7.3 percent of all specialists. In the civilian sector, the inventory increased (39 percent between 1988 and 1999).
- The number of active duty fellows in IM subspecialties also decreased substantially from 94 in FY 1990 to 43 in FY 2000.
- The average YOP for this subspecialty rose from 4.1 to 6.1 years between FY 1987 and FY 2000. At the same time, the YOP in the primary specialty rose from 7.4 to 10.2 years.
- The average age of these specialists increased from 37.6 to 41.3 years between FY 1987 and FY 2000, while the percent male decreased from 94 to 83 percent.

Neurology

The major trends in neurology are the following:

- Unlike most specialties, the inventory of neurologists has remained fairly stable, ranging between 22 and 31 between FY 1987 and FY 2000. It has been especially stable from FY 1995 through FY 2000 ranging between 30 and 31. The inventory in the civilian sector rose 36 percent between 1988 and 1999.
- The number of active duty neurology residents and fellows fell from 13 in FY 1991 to 6 in FY 2000.

- The average age of these specialists rose from 38.2 to 43.4 years between FY 1987 and FY 2000.
- The paygrade distribution changed substantially from 16, 32, 40, and 12 percent in FY 1987 to 3, 32, 32, and 32 percent in FY 2000 for O-3s, O-4s, O-5s, and O-6s, respectively.

Neurological surgery

Two major trends were found for neurological surgery:

- The inventory of neurological surgeons fell from 20 to 11 between FY 1990 and FY 2000. In contrast, the civilian-sector inventory rose 16 percent between 1988 and 1999.
- Over this same period, the number of active duty residents in this specialty ranged from 3 to 10, averaging 7.5 per year.

Nuclear medicine

The inventory of nuclear medicine specialists ranged between 8 and 11 from FY 1987 to FY 2000. The small inventory makes it difficult to distinguish meaningful trends from yearly fluctuations. That said, the inventory in FY 2000 was lower than in any previous year. Also, the average age and average number of years in the specialty increased substantially. This is largely a function of the fact that there were no new fully trained nuclear medicine specialists beginning in FY 1996.

OB/GYN

The trends for obstetrics/gynecology (OB/GYN) are the following:

- The inventory of OB/GYN specialists increased 37 percent from 101 in FY 1990 to 138 in FY 2000. At the same time, the number of active duty OB/GYN residents fell 53 percent from 75 to 35. The inventory in the civilian sector also rose, but by a smaller amount (22 percent between 1988 and 1999.)
- The percentage of OB/GYN specialists who are male decreased from 89 percent in FY 1992 to 59 percent in FY 2000.

Ophthalmology

The major trends for ophthalmology follow:

- Between FY 1987 and FY 2000, the inventory of ophthalmologists ranged between 51 and 72 with an overall upward trend (51 in FY 1987 and 64 in FY 2000). Similarly, the inventory in the civilian sector rose 14 percent between 1988 and 1999.
- The number of active duty ophthalmology residents and fellows has decreased over time. It was as high as 32 in FY 1992 and as low as 10 in FY 2000.
- The average age of these specialists rose from 39.0 to 42.2 years between FY 1987 and FY 2000.

Orthopedic surgery

We found two major trends for orthopedic surgery:

- Between FY 1987 and FY 2000, the inventory of orthopedic surgeons rose 14 percent from 96 to 109 specialists; however, the inventory was highest in FY 1993 with 115 specialists. The inventory growth in the civilian sector was 18 percent between 1988 and 1999, which is similar to the growth in the Navy.
- The number of active duty residents and fellows has steadily declined from a high of 66 in FY 1992 to 49 in FY 2000.

Otolaryngology

The four major trends for otolaryngology are as follows:

- The inventory of otolaryngologists increased from 45 to 63 between FY 1987 and FY 1997 but has since decreased to 47. In the civilian sector, the number of otolaryngologists increased by 16 percent between 1988 and 1999.
- The number of active duty otolaryngology residents and fellows has declined from a high of 47 in FY 1991 to 28 in FY 2000.
- The average age of otolaryngologists rose from 38.2 to 41.5 years between FY 1987 and FY 2000.

- The paygrade distribution shifted from 53, 24, and 22 percent in FY 1987 to 32, 49, and 19 percent in FY 2000 for O-4s, O-5s, and O-6s, respectively.

Pathology

The major trends for pathology are the following:

- Between FY 1987 and FY 1994, the inventory of pathologists increased from 75 to 94, but it decreased to 83 in FY 2000. In the civilian sector, the inventory of pathologists rose 14 percent between 1988 and 1999.
- The number of active duty pathology residents and fellows fell from a high of 43 in FY 1992 to a low of 15 in FY 2000.
- The average age of pathologists rose from 39.3 to 43.5 years between FY 1987 and FY 2000.
- The paygrade distribution between FY 1987 and FY 2000 has shifted from 8, 49, 21, and 21 percent to 4, 28, 49, and 19 percent for O-3s, O-4s, O-5s, and O-6s, respectively.

Pediatrics

The major trends for pediatrics follow:

- The inventory of pediatricians is unlike many other specialties in that it declined from 181 to 132 between FY 1987 and FY 1994 and then rose to 175 in FY 2000. In contrast, the inventory of pediatricians in the civilian sector rose 54 percent between 1988 and 1999.
- Also, unlike most other specialties, there has not been a decline in the number of active duty pediatric residents and fellows, which have ranged between 38 and 54 over the period.
- The percentage of these specialists who are male declined from 77 to 59 percent between FY 1987 and FY 2000.

Physical medicine

The inventory of physical medicine specialists ranged between 1 and 5 from FY 1987 to FY 2000. Because of the small inventory, distinguishing between legitimate trends and yearly fluctuations is difficult. We report no specific trends for these specialists.

Preventive/occupational medicine

The major trends for preventive/occupational medicine (PM/OM) are the following:

- The inventory of PM/OM specialists rose from 28 to 66 between FY 1987 and FY 2000 and accounted for 1.7 and 3.1 percent of the distribution of specialists, respectively, in these years. Similarly, the inventory in the civilian sector rose 73 percent between 1988 and 1999.
- The number of active duty PM/OM residents averaged 27.3 between FY 1987 and FY 1990. Since that time, the number of residents has been substantially less, averaging only 13.1.
- In FY 1987, all PM/OM specialists were male, but by FY 2000, only 73 percent were male.

Psychiatry

We found the following three major trends for psychiatry:

- The inventory of psychiatrists rose from 87 to 125 between FY 1987 and FY 1993, but declined to 97 in FY 2000. In the civilian sector, the inventory rose 19 percent between 1988 and 1999.
- The number of active duty residents and fellows decreased 47 percent from a high of 51 in FY 1990 to a low of 27 in FY 2000.
- The percentage of these specialists who are male fell from 90 to 77 percent between FY 1987 and FY 2000.

Radiology

Diagnostic radiology

The major trends in diagnostic radiology are as follows:

- Although the inventory of these specialists was about the same in FY 1987 and FY 2000 (83 and 85), it has substantially declined from a high of 108 in FY 1996. In the civilian sector, however, the inventory rose 26 percent between 1988 and 1999.
- The number of active duty residents and fellows also fell from a high of 80 in FY 1991 to only 47 in FY 2000.
- The percentage of diagnostic radiologists who are male has decreased from 92 percent in FY 1987 to 80 in FY 2000.

Therapeutic radiology

The inventory of therapeutic radiologists ranged between 7 and 12 from FY 1987 to FY 2000. The small inventory makes it difficult to distinguish between legitimate trends and yearly fluctuations. We report no specific trends for these specialists.

Urology

The three major trends in urology follow:

- The inventory of urologists declined from 42 in FY 1991 to 34 in FY 2000. Also, the number of active duty urology residents and fellows declined from 29 to 19 between FY 1992 and FY 2000, respectively. In contrast, the inventory of urologists in the civilian sector increased 9 percent between 1988 and 1999.
- The average age of urologists consistently increased between FY 1987 and FY 2000 from 38.0 to 40.3 years.
- The paygrade distribution has become slightly more senior. Specifically, O-5s and O-6s accounted for 50 percent of all urologists in FY 1987 compared to 56 percent in FY 2000.

Retention analysis

Given the preceding overview of the Navy specialists, we now turn to examining the retention of Navy medical officers by evaluating:

- The matriculation rate of new accessions into the pool of specialists
- The attrition rate out of the pool of specialists.

We examine these two aspects because we want to thoroughly explore the first stay-leave military decision. To do this, we look at both new accessions and fully trained specialists because most Navy physicians enter into an obligation for residency before they satisfy the initial obligation associated with their schooling subsidization.

We also examine these two aspects because having an insufficient number of physicians to fill billets doesn't necessarily mean that the Navy has a retention problem. Certainly poor retention is one potential cause, but it is not the only one.

It is possible for the Navy to have difficulty filling specialty billets even if retention rates are constant. For example, suppose the Navy has 290 specialty billets and that all are currently filled. From a planning perspective, the important question is: if retention is constant, how many physicians does the Navy need to access each year to replace those who attrite so that it can continue to fill its 290 specialty billets?

For the sake of this example, we assume the following: (1) of those accessed, 67 percent eventually become specialists; (2) new specialists are obligated 3 years, after which 33 percent are retained; and (3) the continuation rate of retained specialists is 95 percent. Given these assumptions, the Navy would need to access 45 physicians per year because, of these 45 physicians, 30 (67 percent) would become specialists. These 30 specialists from each cohort would be obligated 3 years, meaning that at any given time, the Navy would have 90

specialists under obligation. This leaves 200 unobligated specialists, which attrite at 5 percent, or 10 specialists annually. Given that each cohort of 45 physicians produces 30 specialists, 10 (33 percent) of which are retained, each cohort can just replace the specialists lost to attrition each year. This means that if the Navy doesn't fill its specialty billets because it began accessing 40 physicians per year instead of the 45 that it needs, the Navy has an accession problem and not a retention problem. Even if the Navy accesses enough physicians to fill aggregate billets, it may have difficulty filling billets for specific specialties if too few physicians are put into one residency or fellowship program and too many into another.⁸

We examine the first issue—the matriculation rate from the pool of accessions into the pool of specialists—by evaluating Navy physicians' predominant accession source, Armed Forces Health Professions Scholarship Program (AFHPSP) direct accessions. We also study the matriculation rate from the pool of accessions into the pool of specialists by evaluating accessions from the Uniformed Services University of the Health Sciences (USUHS).

We track these accessions from their PGY-1 (intern) year into PCMO tours, residencies, specialties, and/or out of the Navy medical corps. Specifically, we look at whether the attrition rate of new Navy medical officers has changed between the FY 1987 and FY 1997 accession cohorts, and whether the percentage of those tracking into residencies and specialties has changed.

Given these results, we then study the attrition rate of fully trained specialists. We do this by examining the retention behavior of those completing initial residency programs. This allows us to see how many of those flowing into the pool of specialists remain following completion of the active duty obligation (ADO) associated with their residency program.

8. Reference [7] also discusses the various types of potential manpower problems.

Retention of new accessions

This section examines the retention of new accessions into the Navy medical corps to determine whether the percentage of those who stay and become fully trained specialists has changed over time. We do this by evaluating AFHPSP direct and USUHS accessions from FY 1987 through FY 1997 using BUMIS data.⁹ We chose to use AFHPSP direct accessions rather than some other accession source because AFHPSP direct accessions constituted the vast majority of Navy physician accessions. Similarly, we chose to evaluate USUHS accessions because the active duty obligation associated with it is substantially different from AFHPSP accession sources. Let's begin by examining AFHPSP direct accessions. In addition to these two accession sources, we also looked at AFHPSP full deferment accessions for comparison. We did this because the retention behavior of fully deferred AFHPSP accessions is substantially different from either AFHPSP direct or USUHS accessions.

Retention of AFHPSP direct accessions

Our purpose in evaluating AFHPSP direct accessions is to determine the matriculation rate of these new accessions into specialties and to see if the matriculation rate has changed over time. Specifically, we track each cohort of AFHPSP direct accessions (between FY 1987 and FY 1997) from their PGY-1 (intern) year, into PCMO tours, residencies, and specialties as shown in appendix B. Attrition along the way—both before and after residency—is also tracked. Appendix B shows the percentage of each cohort that remained in the Navy and became fully trained specialists.

Although we had BUMIS data through FY 2000, we didn't analyze accessions after FY 1997 because not enough time has elapsed to track any of these accessions into specialties. We isolated AFHPSP direct accessions by extracting all physicians with a source-of-entry (SOE)

9. We used the BUMIS (MED-52) personnel tapes to conduct this study. We find that the quality of the obligated service date (OSD) field in BUMIS is much "richer" than the Navy data contained in the Defense Manpower Data Center tapes.

code equal to 51. All other AFHPSP accession sources—1-year delays (civilian internship) and partial or full Navy Active Duty Delay Specialists (NADDS or deferred AFHPSP)—were omitted.

Demographics

Before we look specifically at tracking these accessions throughout their careers, it is useful to look at each cohort's demographics. The average age at accession increased minimally between FY 1987 and FY 1997 from 27.8 to 28.1 years. Gender mix, however, has changed substantially from 96 percent male in FY 1987 to 69 percent male in FY 1997 (see table 9).

Table 9. AFHPSP direct accession demographics (FY87-97 cohorts)

	FY87	FY88	FY89	FY90	FY91	FY92	FY93	FY94	FY95	FY96	FY97
Population	216	214	230	248	261	254	272	258	242	190	209
Average age	27.8	27.7	27.6	27.7	27.9	27.6	27.7	27.9	28.0	28.7	28.1
Percent male	96	94	81	83	82	77	70	72	72	76	69
Ethnicity (%)											
Caucasian	96	92	94	91	95	94	89	88	89	91	83
Black	3	4	3	2	2	3	3	4	4	2	6
Asian	1	2	0	4	3	3	6	5	3	5	8
Other	0	2	3	3	1	1	2	3	3	2	3

Given this change in gender mix, retention would be affected if attrition rates varied systematically by gender. However, previous CNA research [3] indicates that attrition rates for males and females are not significantly different. Table 9 also shows that the ethnic mix of accessions has become more diverse since FY 1987. Specifically, minorities accounted for 17 percent of accessions in FY 1997 compared with 4 percent in FY 1987. The vast majority of these accessions had no prior military experience, and over 99 percent were accessed as O-3s.

Second-year assignment

Next we consider the typical assignments given to AFHPSP direct accessions immediately following their intern year. As shown in table 10, about 73 percent of graduating interns are assigned to PCMO tours and 27 percent are put directly into residency programs. The

proportions going into PCMO tours and residencies have been roughly the same for almost all cohorts between FY 1987 and FY 1997.

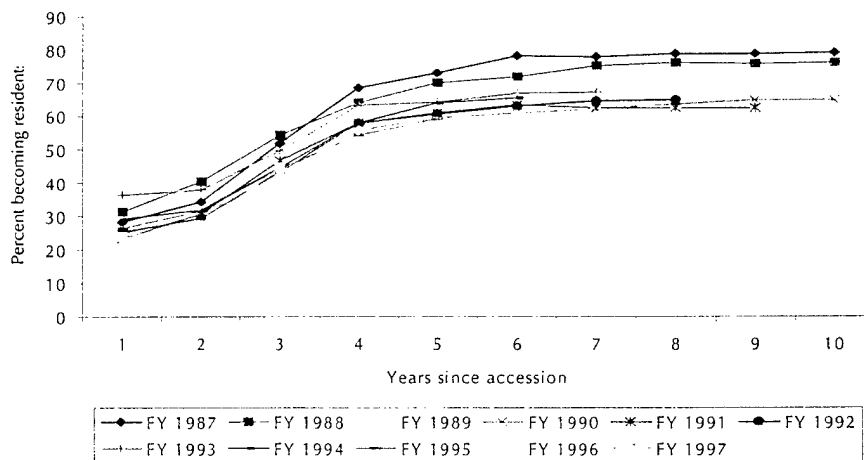
Table 10. AFHPSP direct accessions duty/training assignment following intern year (FY87-97 cohorts)

	FY87	FY88	FY89	FY90	FY91	FY92	FY93	FY94	FY95	FY96	FY97	Avg
Population	216	214	230	248	261	254	272	258	242	190	209	236
PCMO	155	146	170	184	199	189	173	183	177	150	159	171
Resid./fellow	61	67	59	62	61	64	99	75	64	39	50	64
Attrited	0	1	1	2	1	1	0	0	1	1	0	1
Percent of pop.												
PCMO	72	68	74	74	76	74	64	71	73	79	76	73
Resid./fellow	28	31	26	25	23	25	36	29	26	21	24	27
Attrited	0	0	0	1	0	0	0	0	0	1	0	0

Matriculation rate into specialties

As previously stated, the reason we studied AFHPSP direct accessions was to determine whether the matriculation rate of new accessions into residencies and eventually into specialties has changed over time. To do this, we computed the percentage of each AFHPSP direct accession cohort that tracked into a residency as a function of the number of years since accession. These percentages are shown in figure 1.

Figure 1. Percentage of AFHPSP direct accessions that became residents by years since accession (FY87-97 cohorts)



These percentages reflect not only those who were residents in any given year but also those who were fellows, specialists, and specialists who had since attrited. For example, of the 216 individuals in the FY 1987 cohort, 171, or 79 percent of the cohort, became residents by FY 1997 (10 years after accession). Of these 171 individuals in FY 1997, 7 were still residents or fellows, 99 were fully trained specialists still on active duty, and 65 were fully trained specialists who had attrited from the Navy by FY 1997. The other 45 in the cohort were either PCMOs or had attrited following a PCMO tour and had never entered a residency program.

By 6 years after accession, the percentage of each cohort that became residents leveled off. Further examination of figure 1 shows that a higher percentage of the FY 1987 and FY 1988 cohorts than the FY 1989-1997 cohorts went into residencies. Specifically, the percentage going into residencies by 7 years after accession averaged 77 percent for the FY 1987 and FY 1988 cohorts. But, for the FY 1989-1993 cohorts, this percentage was 64 percent—a difference of 13 percentage points from the FY 1987 and FY 1988 cohort average. Making this same comparison at 8 through 10 years since accession, we find a difference of 13 to 14 percentage points each year.

The immediate inference to be drawn from this figure is that, before the FY 1989 cohort, the matriculation rate of accessions into residencies was about 13 or 14 percentage points higher than after it. Despite the upward shift in the attrition rate between the two periods, the attrition rate seems to be otherwise stable beginning in FY 1989 because there has not been any identifiable trend—up or down—in the percentage of each cohort that became residents since FY 1989.

We believe the reason for this upward shift in the attrition rate before residency is a result of a policy change, which increased the obligation associated with residency training. Before April 1988, in-house residencies were obligation neutral.¹⁰ After April 1988, in-house residencies incurred a year-for-year obligation.¹¹

10. Although obligation neutral, the in-house residencies required a 2-year minimum service requirement upon residency completion.

11. This obligation is served concurrently with any existing AFHPSP or USUHS obligation [8].

To see how this policy change would affect the number of years a physician would be obligated, look at the example in table 11. Before April 1988, a medical officer entering a 4-year residency program with a remaining obligation of 2 years would still owe only 2 years once the residency is complete. However, this same medical officer would owe 4 years after the April 1988 change.

Table 11. An example of effect of the April 1988 obligation policy change on 4-year AFHPSP

Reason for obligation change	Before April 1988			After April 1988		
	Change in obligation	Remaining obligation	YOS	Change in obligation	Remaining obligation	YOS
4-year AFHPSP	4	4	0	4	4	0
Navy intern (1 year)	0	4	1	0	4	1
PCMO tour (2 years)	-2	2	3	-2	2	3
Residency or GME (4 years)	0	2	7	4	4	7
Specialist (2 or 4 years)	-2	0	9	-4	0	11

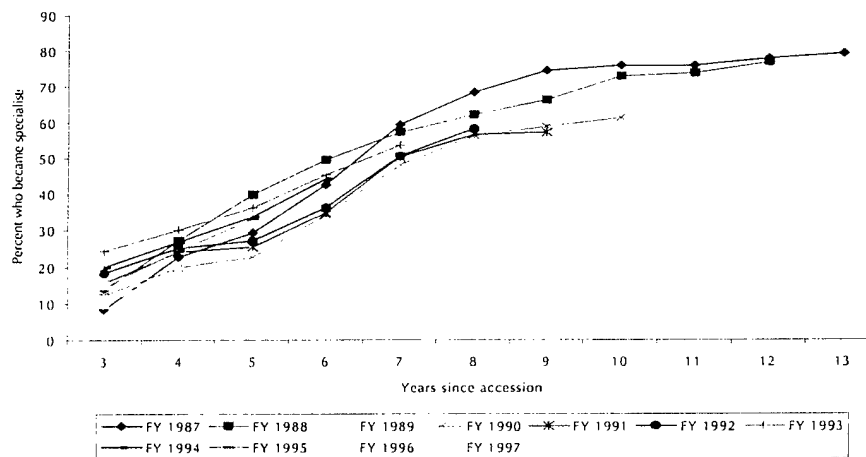
Clearly, the matriculation rate of accessions into residencies decreased as a result of this policy; however, the continuation rate of those who remain in the Navy should be greater after the policy change than before it. The reason is that years of service at completion of the initial ADO will be greater than they were before the policy change. Previous CNA research [3] shows that physician attrition rates decrease as the years to retirement decrease.

It is also possible that the increase in the attrition rate before residency after the policy change is a result of so-called "fence sitters" deciding to attrite before rather than after residency to avoid being obligated for a longer period. If this is the case, the attrition rate after residency should be lower (after the policy change than before it) because the people who were on the fence likely attrited before residency. Combining increased attrition before residency and decreased attrition after it may be a major reason why overall continuation rates of military physicians have not changed significantly during the 1990s, despite widening military-civilian pay gaps [2, 3].

Figure 2 shows the percentage of each cohort that eventually became specialists. Note that no AFHPSP direct accessions became specialists

before 3 years after accession because of the time as an intern and resident. Also, the percentage of the cohort that became specialists rose steadily between 3 and 9 years after accession. One reason for the steady influx of specialists is that some accessions serve PCMO tours before residency training; hence, they will complete their training after those who don't serve as PCMOs. Similarly, physicians in surgical specialties have longer residencies than those in primary care, so their entry in the pool of specialists is later as well.

Figure 2. Percentage of AFHPSP direct accessions that became specialists by years since accession (FY87-97 cohorts)



In general, by 9 years after accession, the percentage of each cohort that became specialists begins to flatten out. However, the percentage of the cohort becoming specialists does increase slightly between 9 and 13 years after accession. This doesn't mean that physicians in the cohort are just completing initial residencies 10 or more years after accession, but it represents fellows returning to the pool of specialists as subspecialists.

Figure 2 tells almost the same story as figure 1, except that the percentage becoming specialists doesn't plateau as quickly as the percentage becoming residents because it takes a while for individuals in each cohort to complete their residencies and become fully trained

specialists. The percentage that eventually became specialists flattened out about 9 or 10 years after accession, unlike the percentage of each cohort that eventually become residents, which flattened out about 6 years after accession. The difference is obviously the time it takes to complete a 3- or 4- year residency program. Again, we see a downward shift in the percentage that eventually became specialists between the FY 1987 and FY 1988 residency cohort and cohorts in later fiscal years. Otherwise, there doesn't appear to be a systematic increase or decrease in the attrition rate from year to year. Hence, the two figures tell virtually the same story.

Retention of USUHS accessions

As with AFHPSP direct accessions, our purpose in evaluating USUHS accessions is to determine the matriculation rate of these new accessions into specialties and to see if that rate has changed over time. Again we track each cohort of USUHS accessions (between FY 1987 and FY 1997) from the PGY-1 (intern) year, into PCMO tours, residencies, and specialties, as shown in appendix C. Attrition along the way—both before and after residency—is also tracked. Appendix C shows the percentage of each cohort that remained in the Navy and became fully trained specialists.

Demographics

Table 12 shows the demographics of the USUHS accession cohorts. The average age at accession increased 1.3 years between FY 1987 and FY 1997 from 28.3 to 29.6 years.¹² Gender mix, however, varied substantially over this period from a low of 71 percent male to a high of 94 percent male.

Table 12 also shows that the ethnic mix of accessions has become more diverse since FY 1987. Minorities accounted for 13 percent of accessions in FY 1997 compared to 0 percent in FY 1987. Similar to the AFHPSP direct accessions, all USUHS accessions were accessed as O-3s. But, unlike AFHPSP direct accessions, many of these accessions

12. This difference is statistically significant at the 10-percent level.

had previous military experience with an average of 2.2 years of service at accession.

Table 12. USUHS accession demographics (FY87-97 cohorts)

	FY87	FY88	FY89	FY90	FY91	FY92	FY93	FY94	FY95	FY96	FY97
Population	41	35	43	45	44	55	46	48	41	48	48
Average age	28.3	28.5	29.1	27.6	28.5	28.0	28.6	29.1	29.0	29.1	29.6
Percent male	88	94	74	71	84	75	78	71	80	71	81
Ethnicity (%)											
Caucasian	100	89	98	91	98	94	98	90	90	79	87
Black	0	0	2	0	0	2	0	0	0	2	0
Asian	0	6	0	7	2	4	0	8	5	17	9
Other	0	6	0	2	0	0	2	2	5	2	4

Second-year assignment

Next we consider the typical assignment given to USUHS accessions right after their intern year. As table 13 shows, about 73 percent of graduating interns were assigned to PCMO tours, and the remaining 27 percent were put directly into residency programs. These are the same percentages of AFHPSP direct accessions going into PCMO tours and residencies (see table 10); apparently, AFHPSP direct accessions and USUHS accessions follow about the same career path.

Table 13. USUHS accessions duty/training assignment following intern year (FY87-97 cohorts)

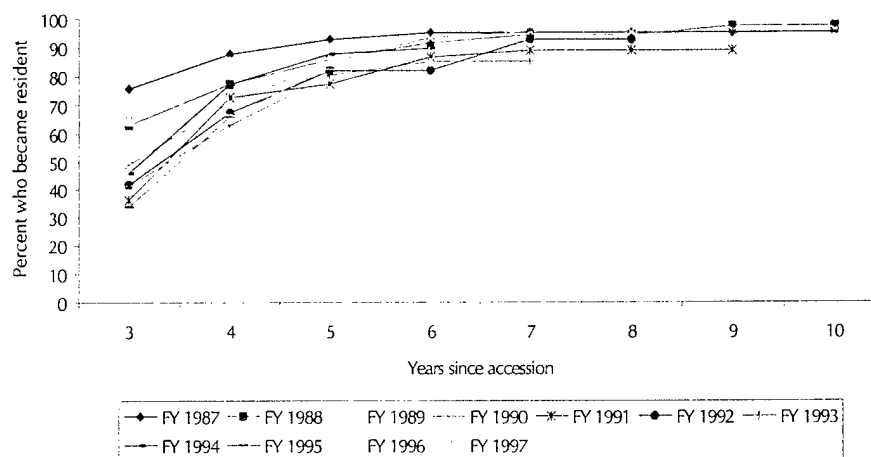
	FY87	FY88	FY89	FY90	FY91	FY92	FY93	FY94	FY95	FY96	FY97	Avg
Population	41	35	43	45	44	55	46	48	41	48	48	45
PCMO	23	27	25	37	37	41	35	38	34	35	30	33
Resid./fellow	18	8	18	8	7	14	11	10	7	13	18	12
Percent of pop.												
PCMO	56	77	58	82	84	75	76	79	83	73	63	73
Resid./fellow	44	23	42	18	16	25	24	21	17	27	38	27

Matriculation rate into specialties

As discussed in previous sections, the reason we have studied USUHS accessions is to determine if the matriculation rate of new accessions into residencies and eventually specialties has changed over time. As

with AFHPSP direct accessions, we did this by computing the percentage of each USUHS accession cohort that tracked into a residency program as a function of the number of years since accession. Figure 3 shows these percentages.

Figure 3. Percentage of USUHS accessions that became residents by years since accession (FY87-97 cohorts)



The percentage becoming residents reflects not only those who were residents but also those who were fellows, specialists, and specialists who have since attrited. For example, of the 35 physicians in the FY 1988 cohort, 34, or 97 percent of the cohort, became residents by FY 1998 (10 years after accession). Of these 34 individuals, 2 were still residents or fellows and the remaining 32 were fully trained specialists still on active duty. The other person in the cohort attrited before entering a residency program.

Figure 3 also shows substantial variation in the percentage becoming residents in the first few years after accession, but this variation consistently decreases as the number of years since accession increases. Also, by 7 years after accession, the percentage of each cohort that became residents leveled off. By 10 years after accession, about 95 percent of each cohort became residents. With AFHPSP direct accessions, we found that the percentage becoming residents fell after FY

1988 as a result of a change in the obligation associated with residency training (see figures 1 and 2). We find no such effect with USUHS accessions.

Recall that, before April 1988, in-house residency programs were obligation neutral and, since April 1988, these residencies incur a year-for-year obligation; however, this obligation is served concurrently with any existing AFHPSP or USUHS obligation. As table 11 shows, a 4-year AFHPSP who serves an intern year, a 2-year PCMO tour, and has a 4-year residency program would owe 2 additional years of service as a result of the obligation policy change. Yet, the obligation policy change should not lengthen the obligation of the vast majority of USUHS accessions. To see why this is the case, consider the example in table 14.

Table 14. An example of effect of the April 1988 obligation policy change on USUHS

Reason for obligation change	Before April 1988			After April 1988		
	Change in obligation	Remaining obligation	YOS	Change in obligation	Remaining obligation	YOS
USUHS	7	7	0	7	7	0
Navy intern (1 year)	0	7	1	0	7	1
PCMO tour (2 years)	-2	5	3	-2	5	3
Residency or GME (4 years)	0	5	7	4	5	7
Specialist (5 years)	-5	0	12	-5	0	12

By law, USUHS accessions have a 7-year active duty obligation. If we assume an intern year and a 2-year PCMO tour (as we did with 4-year AFHPSP), medical officers would still owe 5 years of service after the completion of their PCMO tour. Although physicians would not incur additional years of obligation as a result of their residencies before April 1988, they would still owe 5 years because of their USUHS obligation. Similarly, after April 1988, physicians with up to 5-year residencies would still owe only 5 years after residency completion because the year-for-year residency obligation is served concurrently with any existing AFHPSP or USUHS obligation. Hence, the difference between the initial obligation of AFHPSP and USUHS accessions explains why a smaller percentage of AFHPSP direct accessions

matriculate into residencies after the April 1988 obligation policy change than did before it.

Retention of AFHPSP full deferment accessions

Overall, the career paths of AFHPSP direct and USUHS accessions are very similar—internship, PCMO tour and/or residency, and then practice as a fully trained specialist. AFHPSP full deferment accessions don't follow this pattern; they come into the military as fully trained specialists after completing a civilian residency program. Their obligation is entirely based on their medical school subsidization and not on their residency program because they receive no subsidization while in civilian residencies.

We tracked each cohort of AFHPSP full deferment accessions between FY 1987 and FY 1997 from their accession as fully trained specialists through FY 2000 or until they attrited from the Navy, as shown in appendix D. As with AFHPSP direct accessions, we isolated AFHPSP full deferment accessions using the source-of-entry code in BUMIS. AFHPSP full deferment accessions have an SOE equal to 54—all other AFHPSP accession sources were omitted.

Demographics

The size of these cohorts ranged between 18 and 118 physicians between FY 1987 and FY 1997 with an average of about 64 physicians. The average age of each accession cohort ranged between 30.9 and 33.8 over this same period. The percentage of each cohort that was male fluctuated substantially from 68 to 99 percent between FY 1987 and FY 1997. The ethnic mix of these accessions varied little across the cohorts and, on average, 98 percent were Caucasian.

Retention

Because all AFHPSP full deferment accessions are fully trained specialists, we are really studying the retention of specialists and not the matriculation rate of new accessions into specialties, as we did with AFHPSP direct and USUHS accessions. We examined the retention of these specialists by looking at their survival rate as a function of the years since accession, as figure 4 shows.

Figure 4. Percentage of AFHPSP full deferment accessions surviving by years since accession (FY87-97 cohorts)

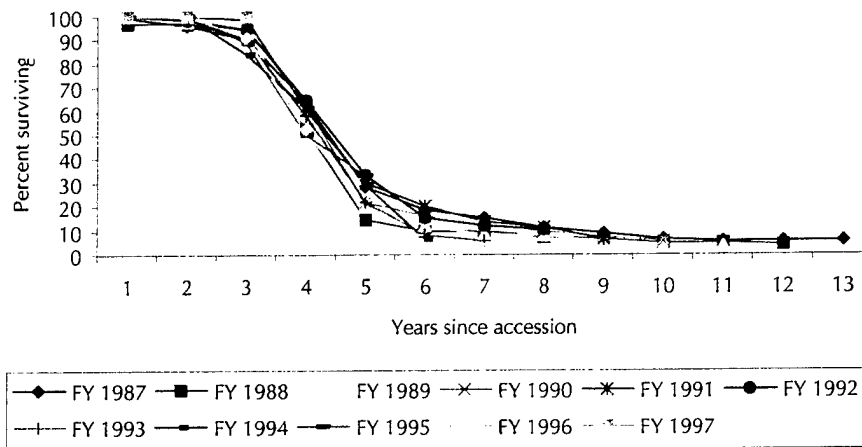


Figure 4 shows consistent survival patterns for fully deferred AFHPSP accessions; each cohort has a sharp decline in survival between 3 and 5 years after accession. Also, the survival rates have not improved or deteriorated in any identifiable way across the cohorts. This is logical given what we observed for AFHPSP direct and USUHS accessions. With the AFHPSP direct accessions, we observed a consistent reduction in retention as a result of the April 1988 obligation policy change; with USUHS, there was no change because USUHS accessions should be largely unaffected by it.

Similarly, with fully deferred AFHPSP accessions, the residency obligation policy change will affect only those specialists who go into a fellowship. Fellowships range between 1 and 3 years, but most are 2 years. Hence, depending on when in a physician's career the fellowship is undertaken, the April 1988 policy change may or may not change their obligation. If it does, it is likely to increase the obligation by only 1 year.

Which accession source is best for the Navy?

We believe that the Navy needs to consider in depth the most cost-effective means of manning its billets. Such an effort is outside the scope of this study, which examined the retention patterns of three accession sources (AFHPSP direct, USUHS, and AFHPSP full deferment). Each one has significantly different retention patterns and career paths.

For example, whereas 95 percent of USUHS accessions are still in the Navy 10 years after accession, 95 percent of AFHPSP full deferment accessions leave the Navy by this same time. Planners shouldn't necessarily conclude that, because USUHS retention is high and fully deferred AFHPSP retention is low, USUHS is always the better option. On one hand, USUHS accessions are more cost-effective than fully deferred AFHPSP accessions in terms of manning O-5 or O-6 billets because of the differences in retention patterns. On the other hand, fully deferred AFHPSP accessions may be more cost-effective than USUHS accessions in terms of manning O-3 or O-4 billets because the Navy's investment in fully deferred AFHPSP is substantially less than USUHS accessions. The other advantage of fully deferred AFHPSP over USUHS accessions is that the fully deferred AFHPSP come in as specialists and not as physicians that must be grown into specialists.

Also, to have the correct experience profile in the medical corps, the Navy doesn't want to retain all of its O-3s and O-4s. If the Navy had only USUHS accessions, it likely wouldn't be able to keep and promote as many physicians as might want to remain. Given the large investment in these accessions, it would be very costly to force some out. Similarly, if the Navy only had AFHPSP full deferment accessions, it would likely not retain enough physicians to fill the O-5 and O-6 billets without substantially increasing physician compensation.

Now that we have examined the matriculation rate of accessions into residencies and then specialties, we will look at the retention patterns of those who actually became specialists.

Retention of specialists

Methodology

To study the retention of specialists, we isolated those Navy medical officers as they entered the pool of specialists for the *first time*. We isolated these first-time specialists through the initial residency completion (IRC) field in BUMIS. The IRC field gives the date each medical officer completed his/her initial residency program and became a fully trained specialist. BUMIS also contains fields indicating completion of second, third, and fourth residency programs. However, we did not isolate and track the attrition of these specialists because this study focuses on the first stay-leave decision. Future studies could use these fields to study retention after second residencies or fellowships.

Using BUMIS, we tracked first-time specialists from year to year to determine if and when they attrited from the Navy medical corps. We didn't calculate attrition rates as a function of years since IRC because ADOs vary by individual as a result of differences in accession source, length of GMO tour, and length of residency training [5]. Rather, we calculated attrition rates conditional on whether the ADO was completed and, if completed, conditional on how many years since completion. These attrition rates enabled us to examine attrition relative to the critical stay-leave point.

We estimated ADOs based on the OSD-1 field. The OSD-1 field lists the date until which each medical officer is obligated to serve. In the year each officer was assessed, the OSD-1 field contains the date associated with the obligation for medical school subsidization. When an officer enters a residency program, the OSD-1 field changes to reflect the obligated service date associated with the residency program. At the same time, the OSD-2 field reflects the original obligated service date associated with medical school.

If an officer later chooses to enter a second residency program or a fellowship, the OSD-1 field changes to reflect the obligation associated with the fellowship. Similarly, the OSD-2 field reflects the obligation for initial residency, and the OSD-3 field reflects the obligation associated with the initial procurement program.

We stratified the pool of specialists by specialty because the results of the analysis are more meaningful on the specialty level. There are limitations, however, because many specialties have a small number of physicians completing residency programs in any given fiscal year. Given this limitation, we provide an analysis of only the largest specialties—family practice, internal medicine, pediatrics, general surgery, OB/GYN, orthopedic surgery, anesthesiology, and radiology.

Because we don't want to lose information from the specialties with insufficient numbers to be analyzed individually, we have also stratified the sample into three major specialty groups—primary care specialties, surgical specialties, and other specialties. The specialties included in these groups are the following:

- Primary care specialties—family practice, internal medicine, pediatrics, and preventive/occupational medicine.
- Surgical specialties—general surgery, neurological surgery, OB/GYN, ophthalmology, otolaryngology, orthopedic surgery, and urology.
- Other specialties—aerospace medicine, anesthesiology, dermatology, emergency medicine, neurology, nuclear medicine, pathology, physical medicine, psychiatry, and radiology.¹³

Primary care specialties

Family practice

We begin our analysis of individual specialties and specialty groups by looking at the retention of first-time family practitioners. In FY 1987, 40 Navy physicians completed initial residency training and became fully trained family practitioners. Between FY 1987 and FY 1996, the number completing residencies in family practice ranged between 35 and 64 individuals, averaging about 42 per fiscal year. Since FY 1996, however, residency training output has steadily increased to 70 specialists in FY 2000 (see table 15).

13. Note that no individuals completed initial residencies in nuclear medicine between FY 1987 and FY 2000.

Table 15. Family practice initial residency training output, ADO, board certification, and attrition, by fiscal year of initial residency completion (FY87-00)

	Fiscal year															
	87	88	89	90	91	92	93	94	95	96	97	98	99	00	Avg	
Population	40	45	35	64	45	45	36	29	37	40	55	61	66	70	47.7	
Direct			1	1		2	1		1			4			0.7	
AFHPSP direct	27	27	18	33	30	35	25	23	27	33	30	30	29	28	28.2	
AFHPSP indirect	6	6	7	8	9	3	5	1	2	1	1				3.5	
AFHPSP NADDS	3	9	5	20					1	1	11	18	23	26	8.4	
AFHPSP recall								1	2	1	1	3	3	11	1.6	
USUHS	2	2	3	2	5	4	3	4	3	4	11	6	11	5	4.6	
Other	2	1	1		1	1	2		1		1				0.7	
Demographics^a																
Average age	32	32	33	32	34	33	34	34	32	32	32	33	33	33	32.7	
Percent male	88	87	89	95	98	89	94	69	84	73	84	80	68	74	83	
No. of dependents	1.8	1.9	1.8	2.2	2.4	2.0	2.8	1.6	1.8	1.6	1.8	1.8	1.7	1.9	1.9	
Percent married	90	81	79	80	91	93	92	86	77	75	81	80	82	^b	85	
Ethnicity (percent)																
Caucasian	95	95	91	95	98	86	89	100	97	90	96	86	85	87	91	
Black	5	2	3	4	2	9	3	0	3	3	2	7	4	4	4	
Asian	0	2	6	2	0	2	6	0	0	5	2	7	9	7	4	
Other	0	0	0	0	0	2	3	0	0	3	0	0	2	2	1	
YOS	4.7	4.3	5.3	4.2	6.5	5.2	6.5	5.7	4.4	4.3	4.6	4.0	5.1	5.2	4.9	
YOCS	4.6	4.2	4.9	3.8	5.9	4.8	5.8	4.8	3.8	4.2	4.3	3.6	4.5	4.3	4.4	
ADO (years)	2.7	2.7	2.7	3.0	3.0	2.9	3.0	2.9	3.3	3.4	3.5	3.5	3.5	3.9	3.2	
Cum. attrition (%)																
Before ADO	3	2	3	5	4	2	0	7	8	6	0	17			4	
At ADO	45	29	29	48	40	36	36	37	42	39	37				38	
1 year after ADO	60	49	49	59	49	64	58	67	58	47					56	
2 years after ADO	63	53	54	63	49	78	64	74	58						61	
3 years after ADO	65	60	60	64	51	80	64	78							65	
4 years after ADO	68	60	63	69	53	80	67								66	

a. Demographic variables represent the characteristics of the population at the time of initial residency completion.

b. Not reported because of missing data.

The average age at completion of residency training was 32.7 years between FY 1987 and FY 2000. Over this same period, the percentage that was male averaged 83 percent, declining from 88 percent in FY 1987 to 74 percent in FY 2000. These specialists had on average 1.9 dependents each, and 85 percent were married. The ethnic mix of

the training output has become more diverse between FY 1987 and FY 2000. Minorities accounted for 5 percent of the FY 1987 residency cohort compared to 13 percent of the FY 2000 cohort. Also, family practitioners averaged 4.9 YOS and 4.4 YOCS at the time their initial residencies were completed.

As shown in table 15, the average ADO associated with family practice residencies increased from 2.7 to 3.9 years between the FY 1987 and FY 2000 cohorts. This increase is largely a function of the accession mix of the FY 1987 cohort compared to cohorts in later years. The average ADOs of USUHS and AFHPSP direct accessions over this period were 5.7 and 2.8 years, respectively.

Cumulative attrition rates for family practitioners in all cohorts were 4 percent before the completion of ADO, 38 percent at completion, 56 percent 1 year after completion, 61 percent 2 years after completion, 65 percent 3 years after completion, and 66 percent 4 years after completion. Examination of table 15 shows that cumulative attrition rates vary substantially from cohort to cohort; this may be the result of the small population size. Specifically, the highest cumulative attrition rate at completion of the ADO is 48 percent for the FY 1990 cohort, and cumulative attrition rates in later cohorts have ranged from 36 to 42 percent, which are close to the average of 38 percent for all cohorts.

High variation among the cohorts makes it hard to draw meaningful inferences about changes in attrition. The variation in cumulative attrition rates is less if we look at attrition over multiple cohorts rather than just one. We make a multicohort comparison by comparing the cumulative attrition rate at ADO completion before and after the residency obligation policy change (April 1988).

The before period comprises the FY 1987 to FY 1991 cohorts. We used these cohorts because anyone entering residency after April 1988 isn't likely to complete it by the end of FY 1991. The after period comprises the FY 1993 through FY 1997 cohorts. We used FY 1993 as the beginning of the after period because anyone entering a 4-year residency by summer 1988 would have completed it by the end of FY 1992. Also, we used the FY 1997 cohort as the end of the after period because it is the

last cohort for which we have a cumulative attrition rate at ADO completion.

Specifically, the cumulative attrition rates at ADO completion for family practitioners before and after the obligation policy change were 39 and 38 percent, respectively, but these percentages are not statistically different.¹⁴

Internal medicine

In FY 1987, 46 Navy physicians completed initial residency training and became fully trained internal medicine physicians compared to 31 in FY 2000. Over this period, the number completing residency training has fluctuated between 25 and 54 physicians; however, since FY 1998, this number has ranged from 27 to 31 physicians (see table 16).

The average age at completion of residency training was 31.6 years between FY 1987 and FY 2000. Over this same period, the percentage that was male averaged 82 percent, declining from 83 percent in FY 1987 to 65 percent in FY 2000. These specialists had on average 1.3 dependents each, and 74 percent were married. The ethnic mix of the training output became more diverse between FY 1987 and FY 2000. Minorities accounted for 0 percent of the FY 1987 residency cohort compared to 8 percent of the FY 2000 cohort. Also, general internists averaged 4.1 YOS and 3.9 YOCS at the time their initial residencies were completed.

As shown in table 16, the average ADO associated with internal medicine residencies ranged between 3.1 and 4.6 years between the FY 1987 and FY 2000 cohorts. The average ADO depends on the mix of initial accession sources of the physicians in each cohort. The average ADOs of USUHS and AFHPSP direct accessions over this period were 7.1 and 3.4 years, respectively.

14. Note that in this and all subsequent comparisons of cumulative attrition rates between various periods, we weren't able to control for variation in the mix of accession sources. Changes in accession mix may explain in part differences in cumulative attrition rates between periods.

Table 16. Internal medicine initial residency training output, ADO, board certification, and attrition, by fiscal year of initial residency completion (FY87-00)

	Fiscal year															Avg
	87	88	89	90	91	92	93	94	95	96	97	98	99	00		
Population	46	54	25	35	40	29	28	37	35	45	47	29	27	31	36.3	
Direct		2	1	3	2			2	1		1		1		0.9	
AFHPSP direct	22	26	15	22	24	21	22	29	25	37	36	21	21	23	24.6	
AFHPSP indirect	5	3	2	1	4	5	2		1			2		1	1.9	
AFHPSP NADDS	18	21	5	4	2					1	4	3	1	4	4.5	
AFHPSP recall						1	2	3	4	2	2			1	1.1	
USUHS	1	2	2	5	5	2	2	3	3	5	4	3	4	2	3.1	
Other					3				1						0.3	
Demographics ^a																
Average age	31	32	31	32	33	32	32	32	32	31	30	31	33	32	31.6	
Percent male	83	91	92	94	95	97	82	70	80	76	79	69	67	65	82	
No. of dependents	1.4	1.2	1.1	1.6	1.6	1.6	1.4	1.1	1.4	0.8	1.4	1.2	1.4	1.5	1.3	
Percent married	77	71	80	70	79	72	75	77	65	58	74	71	68	^b	74	
Ethnicity (percent)																
Caucasian	100	94	100	94	95	100	89	89	85	89	87	100	88	92	93	
Black	0	6	0	0	0	0	4	3	6	2	5	0	0	4	2	
Asian	0	0	0	6	5	0	4	6	0	5	0	0	8	4	2	
Other	0	0	0	0	0	0	4	3	9	5	8	0	4	0	2	
YOS	3.2	3.3	4.1	4.4	5.1	5.1	4.5	3.8	4.1	3.9	3.6	3.9	5.0	4.4	4.1	
YOCS	3.2	3.1	4.1	4.4	4.9	5.0	4.0	3.8	3.7	3.7	3.3	3.9	5.0	4.4	3.9	
ADO (years)	3.3	3.3	3.8	4.1	3.4	3.1	4.2	3.2	3.8	4.6	4.2	4.0	3.3	3.5	3.7	
Cum. attrition (%)																
Before ADO	4	4	0	11	0	0	8	3	3	3	5	9			4	
At ADO	39	39	16	26	18	38	35	33	26	42	42				32	
1 year after ADO	57	52	36	40	38	48	42	42	42	45					45	
2 years after ADO	59	56	52	49	40	52	42	47	45						50	
3 years after ADO	67	61	64	57	50	52	46	53							57	
4 years after ADO	76	70	72	66	53	62	50								65	

a. Demographic variables represent the characteristics of the population at the time of initial residency completion.

b. Not reported because of missing data.

Cumulative attrition rates for these physicians averaged 4 percent before the completion of their ADO, 32 percent at completion, and 45, 50, 57, and 65 percent 1, 2, 3, and 4 years after completion. Examination of table 16 shows that cumulative attrition rates vary substantially from cohort to cohort, possibly because of the small population size.

For example, the cumulative attrition rates at ADO completion for the FY 1987-1988, FY 1992-1994, and FY 1996-1997 cohorts were above the average of 32 percent, and were below the average in all other cohorts. Hence, there is no obvious trend—up or down—in the cumulative attrition rate at ADO completion of general internists. Also, the cumulative attrition rates for general internists before and after the obligation policy change were 30 and 35 percent, respectively. However, we can't say that attrition for general internists is higher after the policy change than before it because these percentages aren't statistically different.

Pediatrics

In FY 1987, 32 Navy physicians completed initial residency training and became fully trained pediatricians—compared to 29 in FY 2000. However, the number completing residency training ranged from 15 to 21 physicians between FY 1988 and FY 1999. Why the residency output in FY 1987 and FY 2000 was so much higher than in the other fiscal years is unknown (see table 17).

The average age at completion of residency training was 30.8 years between FY 1987 and FY 2000. Over this same period, the percentage that was male averaged 61 percent, declining from 69 percent in FY 1987 to 52 percent in FY 2000. On average, these specialists had 1.1 dependents each and 74 percent were married. The ethnic mix of the training output varied substantially between FY 1987 and FY 2000, likely because of the small number of physicians completing residencies in each fiscal year. Overall, 92 percent were Caucasian, 4 percent were black, 3 percent were Asian, and 2 percent were of other ethnicities. Also, internal medicine physicians averaged 3.6 YOS and 3.4 YOCS at the time their initial residencies were completed.

As shown in table 17, the average ADO associated with pediatric residencies ranged between 2.9 and 4.7 years between the FY 1987 and FY 2000 cohorts. The average ADO depends on the mix of initial accession sources of the physicians in each cohort. The average ADOs of USUHS and AFHPSP direct accessions of all cohorts were 6.6 and 3.4 years, respectively.

Table 17. Pediatric initial residency training output, ADO, board certification, and attrition, by fiscal year of initial residency completion (FY87-00)

	Fiscal year															Avg
	87	88	89	90	91	92	93	94	95	96	97	98	99	00		
Population	32	18	21	19	20	19	15	15	15	17	16	19	19	29	19.6	
Direct		1	1	1				1							0.3	
AFHPSP direct	14	12	12	13	14	11	13	12	9	14	14	14	13	12	12.6	
AFHPSP indirect	1	1		1	2	1					1				0.5	
AFHPSP NADDS	15	2	3									3	5	14	3.0	
AFHPSP recall										1					0.1	
USUHS	2	2	5	4	4	7	1	2	6	2	1	2	1	3	3.0	
Other							1								0.1	
Demographics ^a																
Average age	30	30	31	32	30	32	30	30	30	30	32	31	32	31	30.8	
Percent male	69	72	67	79	80	68	60	67	67	35	38	53	42	52	61	
No. of dependents	1.1	0.7	1.4	1.8	0.7	1.4	0.8	1.1	0.8	1.4	1.2	1.6	0.7	0.9	1.1	
Percent married	67	53	79	83	50	67	67	87	67	82	63	89	80	^b	74	
Ethnicity (percent)																
Caucasian	88	94	95	94	85	100	93	100	93	88	100	93	94	^b	92	
Black	4	6	5	6	0	0	0	0	7	0	0	7	0	^b	4	
Asian	8	0	0	0	5	0	0	0	0	6	0	0	6	^b	3	
Other	0	0	0	0	10	0	7	0	0	6	0	0	0	^b	2	
YOS	2.5	3.4	5.0	3.3	3.9	5.3	3.9	3.7	3.1	3.5	3.6	3.4	4.1	2.3	3.6	
YOCs	2.6	3.4	4.4	3.3	3.7	4.1	3.9	3.5	3.1	3.5	3.2	3.4	4.1	2.3	3.4	
ADO (years)	3.5	3.1	4.0	4.7	3.7	4.4	2.9	4.1	4.9	3.9	3.8	4.1	3.5	3.9	3.9	
Cum. attrition (%)																
Before ADO	6	0	0	5	0	0	0	0	11	0	0	0			2	
At ADO	66	22	19	47	40	32	53	58	56	56	60				45	
1 year after ADO	75	44	38	53	45	32	73	67	78	69					56	
2 years after ADO	81	44	48	58	55	37	73	67	78						60	
3 years after ADO	88	67	48	58	60	37	80	67							64	
4 years after ADO	88	67	48	58	60	37	80								64	

a. Demographic variables represent the characteristics of the population at the time of initial residency completion.

b. Not reported because of missing data.

Cumulative attrition rates for these physicians averaged 2 percent before the completion of their ADO, 45 percent at completion, and 56, 60, 64, and 64 percent 1, 2, 3, and 4 years after completion. Examination of table 17 shows that cumulative attrition rates vary substantially from cohort to cohort, which may be a result of the small

population size. For instance, cumulative attrition at ADO completion was as low as 19 percent in FY 1989 and as high as 66 percent in FY 1987. Given the yearly variation, there is no obvious upward or downward trend in the cumulative attrition rate between the FY 1987 and FY 1997 cohorts.

The cumulative attrition rates for pediatricians before and after the obligation policy change were 42 and 56 percent, respectively, for a difference of 14 percentage points. Unlike family practitioners and general internists, this difference is statistically significant (at the 10-percent level). Hence, the cumulative attrition rate at ADO completion for pediatricians is higher after the obligation policy change than before it.

All primary care specialties combined

Now that we have looked at the attrition behavior of three individual specialties in the primary care group, we consider the attrition behavior of the group as a whole. In FY 1987, 121 Navy physicians completed initial residency training and became fully trained specialists in primary care specialties. Recall that primary care specialties include family practice, internal medicine, pediatrics, and preventive/occupational medicine. Between FY 1987 and FY 1992, the number of physicians completing residencies in primary care specialties ranged between 92 and 128 and averaged about 115 per fiscal year. Since FY 1993, however, annual residency output has steadily increased from 80 to 142 specialists in FY 2000 (see table 18).

The average age at completion of residency training was 32.3 years between FY 1987 and FY 2000. Over this same period, the percentage that was male averaged 78 percent, declining from 81 percent in FY 1987 to 65 percent in FY 2000. These specialists had on average 1.6 dependents each, and 79 percent were married. The ethnic diversity of the training output between FY 1987 and FY 2000 has increased. Minorities accounted for 5 percent of the FY 1987 residency cohort compared to 13 percent in the FY 2000 cohort. Also, primary care physicians averaged 4.7 YOS and 4.4 YOCS at the time their initial residencies were completed.

As shown in table 18, the average ADO associated with residencies in primary care increased from 3.1 to 3.7 years between the FY 1987 and

FY 2000 cohorts. This increase is largely a function of the small number of USUHS accessions in the FY 1987 cohort compared to cohorts in later fiscal years. The average ADOs of USUHS and AFHPSP direct accessions of all cohorts were 6.2 and 3.1 years, respectively.

Table 18. Primary care specialties' initial residency training output, ADO, board certification, and attrition, by fiscal year of initial residency completion (FY87-00)

	Fiscal year															
	87	88	89	90	91	92	93	94	95	96	97	98	99	00	Avg	
Population	121	128	92	127	121	100	80	83	92	107	125	115	115	142	111	
Direct		5	3	6	5	2	2	3	3	1	1	4	1		2.6	
AFHPSP direct	65	73	52	71	74	71	60	65	63	84	85	69	65	71	69.1	
AFHPSP indirect	13	10	11	11	16	10	7	1	5	3	3	2		1	6.6	
AFHPSP NADDS	36	33	13	25	2				1	2	15	24	29	44	16.0	
AFHPSP recall						1	2	4	6	4	3	3	3	13	2.8	
USUHS	5	6	10	11	17	14	6	9	12	13	16	13	17	12	11.5	
Other	2	1	3	3	7	2	3	1	2		2			1	1.9	
Demographics ^a																
Average age	31	32	32	33	34	33	33	32	32	32	32	33	33	32	32.3	
Percent male	81	85	85	91	91	87	84	70	78	68	77	74	62	65	78	
No. of dependents	1.5	1.4	1.6	2.0	1.9	1.7	1.9	1.3	1.5	1.2	1.6	1.6	1.4	1.7	1.6	
Percent married	79	73	80	78	80	79	81	83	69	69	77	79	75	^b	79	
Ethnicity (percent)																
Caucasian	95	95	95	95	95	94	90	95	92	90	93	92	88	87	93	
Black	3	4	2	3	1	4	3	1	4	2	3	5	2	5	3	
Asian	2	1	2	3	3	1	4	2	0	5	1	3	8	5	3	
Other	0	0	0	0	2	1	4	1	3	4	3	0	2	2	1	
YOS	3.6	4.0	5.4	4.5	6.3	5.4	5.4	4.5	4.3	4.4	4.4	4.4	5.0	4.6	4.7	
YOCS	3.6	3.8	5.0	4.3	5.9	4.9	4.9	4.1	3.9	4.2	4.0	4.2	4.7	4.2	4.4	
ADO (years)	3.1	3.0	3.4	3.6	3.2	3.2	3.4	3.2	3.8	4.0	3.7	3.7	3.4	3.7	3.5	
Cum. attrition (%)																
Before ADO	4	3	2	8	2	2	3	4	8	3	2	11			4	
At ADO	47	31	21	40	31	35	38	38	36	42	38				36	
1 year after ADO	62	47	38	50	43	53	55	55	53	49					50	
2 years after ADO	65	51	47	56	45	62	58	60	54						55	
3 years after ADO	71	59	53	60	50	63	60	64							60	
4 years after ADO	75	63	57	65	52	66	63								63	

a. Demographic variables represent the characteristics of the population at the time of initial residency completion.

b. Not reported because of missing data.

Cumulative attrition rates for these physicians averaged 4 percent before the completion of their ADO, 36 percent at completion, and 50, 55, 60, and 63 percent 1, 2, 3, and 4 years after completion. Examination of table 18 shows that cumulative attrition rates vary substantially from cohort to cohort. Specifically, the cumulative attrition rate at ADO completion was lowest for the FY 1989 cohort (21 percent) and highest for the FY 1987 cohort (47 percent). Given the yearly variation, there is no obvious upward or downward trend in the cumulative attrition rate between the FY 1987 and FY 1997 cohorts.

The cumulative attrition rates for primary care specialists before and after the obligation policy change were 35 and 39 percent, respectively, but the difference is not statistically significant. Hence, while pediatricians have a higher attrition rate after the policy change than before, primary care specialists as a group have about the same attrition rate in both periods.

Surgical specialties

General surgery

In FY 1992, 34 Navy physicians completed initial residency training and became fully trained general surgeons. Since then, the number completing residencies in general surgery has steadily declined to 16 specialists in FY 2000 (see table 19). The FY 2000 residency output was about 47 percent of what it was in FY 1992.

The average age at completion of residency training was 33.1 years between FY 1987 and FY 2000. Over this same period, the percentage that was male averaged 91 percent, declining from 95 percent in FY 1987 to 69 percent in FY 2000. These specialists had on average 1.9 dependents each and 77 percent were married. The ethnic mix of the training output among the FY 1987 and FY 2000 cohorts has fluctuated substantially from cohort to cohort, likely because of the small sample size. Overall, Caucasians accounted for 92 percent of the residency output, blacks for 3 percent, Asians for 4 percent, and other ethnicities for 1 percent. Also, general surgeons averaged 4.2 for YOS and YOCS at the time their initial residencies were completed.

As shown in table 19, the average ADO associated with general surgery residencies ranged from 3.1 to 4.1 years between the FY1987 and FY 2000 cohorts. The ADO depends somewhat on the initial accession source mix of each cohort. The average ADOs of USUHS and AFHPSP direct accessions over this period were 5.1 and 2.8 years, respectively.

Table 19. General surgery initial residency training output, ADO, board certification, and attrition, by fiscal year of initial residency completion (FY87-00)

	Fiscal year																	Avg
	87	88	89	90	91	92	93	94	95	96	97	98	99	00				
Population	21	24	28	33	28	34	25	19	19	14	17	11	20	16				22.1
Direct		3	1		2	1	1		3	1		1	1					1.0
AFHPSP direct	10	8	11	9	7	8	9	10	9	9	9	8	5	4				8.3
AFHPSP indirect		2				2			2				2	1				0.9
AFHPSP NADDS	9	7	14	19	11	16	12	6	3	2	1		5	4				7.8
AFHPSP recall						1			1	2	2	1	3	3				0.9
USUHS	1	2	1	2	4	4	3	1	1		1	1	3	4				2.0
Other	1	2	1	3	4	2		2			1		1					1.2
Demographics^a																		
Average age	31	33	32	33	33	33	33	33	35	33	34	35	33	34				33.1
Percent male	95	83	93	94	100	100	100	89	89	93	94	73	80	69				91
No. of dependents	1.7	1.4	1.4	2.1	1.9	1.6	1.8	2.1	2.2	1.5	2.3	1.5	2.1	2.9				1.9
Percent married	76	68	77	74	89	67	76	87	78	71	82	70	b	b				77
Ethnicity (percent)																		
Caucasian	92	88	86	97	95	94	96	84	95	93	86	89	b	b				92
Black	8	4	10	3	0	3	0	11	0	7	0	0	b	b				3
Asian	0	8	5	0	0	3	4	5	0	0	7	11	b	b				4
Other	0	0	0	0	5	0	0	0	5	0	7	0	b	b				1
YOS	4.1	3.8	2.9	3.3	3.9	3.2	4.0	4.6	5.8	4.7	6.0	6.8	4.8	5.9				4.2
YOCs	4.1	4.0	2.9	3.0	3.8	3.1	3.9	4.6	5.2	4.7	5.9	6.8	4.6	5.9				4.2
ADO (years)	3.6	3.3	3.2	3.9	3.4	3.5	3.3	3.2	3.7	3.1	3.5	2.8	3.3	4.1				3.4
Cum. attrition (%)																		
Before ADO	5	0	7	3	4	3	0	0	0	0	0	0						2
At ADO	62	42	50	67	21	32	32	28	25	31	58							41
1 year after ADO	81	58	61	79	54	53	48	39	38	46								58
2 years after ADO	86	67	68	82	61	62	56	56	38									65
3 years after ADO	90	71	71	85	64	68	56	56										71
4 years after ADO	95	75	71	88	71	76	68											78

a. Demographic variables represent the characteristics of the population at the time of initial residency completion.

b. Not reported because of missing data.

Cumulative attrition rates for these physicians averaged 2 percent before the completion of ADO, 41 percent at completion, and 58, 65, 71, and 78 percent 1, 2, 3, and 4 years after completion. Examination of table 19 shows that cumulative attrition rates vary substantially from cohort to cohort; this may be due to the small population size. Specifically, the cumulative attrition rate at ADO completion ranged from 21 to 67 percent, with an average of 41 percent. The 58-percent cumulative attrition rate for the FY 1997 cohort was above the 41-percent average; however, the cumulative attrition rate in each cohort between FY 1991 and FY 1996 was below the average. Given the yearly variation, there is no obvious yearly trend in the attrition rate between FY 1987 and FY 1997.

The cumulative attrition rates for general surgeons before and after the obligation policy change were 49 and 33 percent, respectively, for a difference of 16 percentage points. This difference is statistically significant (at the 5-percent level). Hence, the cumulative attrition rate at ADO completion for general surgeons is lower after the obligation policy change than before it.

OB/GYN

Between FY 1987 and FY 2000, an average of 22.4 Navy physicians completed initial residency training and became fully trained OB/GYN specialists. Annually the training output over this period fluctuated between 16 and 29 specialists, and there does not appear to be any identifiable upward or downward trend in the size of the training output (see table 20).

The average age at completion of residency training was 32.6 years between FY 1987 and FY 2000. Over this same period, the percentage that was male averaged 67 percent, declining from 70 percent in FY 1987 to 58 percent in FY 2000. These specialists had on average 1.8 dependents each and 80 percent were married. The ethnic mix of the training output has varied substantially over the cohorts, and on average Caucasians accounted for 89 percent of OB/GYN specialists, blacks for 7 percent, Asians for 3 percent, and other ethnicities for 2

percent.¹⁵ Also, OB/GYN specialists averaged 4.2 YOS and 3.9 YOCS at the time their initial residencies were completed.

Table 20. OB/GYN initial residency training output, ADO, board certification, and attrition, by fiscal year of initial residency completion (FY87-00)

	Fiscal year															Avg
	87	88	89	90	91	92	93	94	95	96	97	98	99	00		
Population	20	25	25	21	21	19	24	19	16	23	29	26	27	19	22.4	
Direct		2		1		1	2	1	1	1					0.6	
AFHPSP direct	16	14	15	15	11	16	17	14	14	9	12	9	12	9	13.1	
AFHPSP indirect	1	1	3	1	2					1			2		0.8	
AFHPSP NADDS	3	7	4	3	2	1	2	2		7	14	14	8	4	5.1	
AFHPSP recall									1	1	2	1	3	2	0.7	
USUHS		1	2	1	6	1	2	2		3	1	2	2	4	1.9	
Other			1				1			1					0.2	
Demographics ^a																
Average age	31	32	33	33	33	33	33	31	32	33	32	33	32	34	32.6	
Percent male	70	68	100	76	90	74	71	63	44	74	45	54	52	58	67	
No. of dependents	1.4	2.2	2.0	2.0	1.9	2.5	2.3	1.7	1.2	2.0	1.3	1.3	1.3	2.7	1.8	
Percent married	83	91	88	76	75	89	86	83	75	77	66	75	70	^b	80	
Ethnicity (percent)																
Caucasian	79	92	100	95	94	95	96	89	75	100	93	83	75	72	89	
Black	7	8	0	5	6	0	4	5	25	0	4	11	6	17	7	
Asian	14	0	0	0	0	0	0	0	0	0	4	0	13	11	3	
Other	0	0	0	0	0	5	0	5	0	0	0	6	6	0	2	
YOS	3.9	4.4	5.0	4.7	4.7	4.4	5.1	4.0	4.4	4.0	2.3	3.2	2.8	6.4	4.2	
YOCS	3.9	4.0	4.7	4.3	4.5	4.4	5.0	3.8	4.4	3.9	2.3	3.0	2.7	4.8	3.9	
ADO (years)	3.7	3.4	3.3	3.9	4.3	3.6	3.4	3.7	3.4	3.8	3.9	4.0	4.0	4.2	3.8	
Cum. attrition (%)																
Before ADO	10	8	4	10	5	11	0	0	7	5	0	0			5	
At ADO	60	72	60	76	62	79	43	41	67	43	27				59	
1 year after ADO	65	80	72	90	76	89	70	65	87	62					75	
2 years after ADO	70	80	84	90	76	95	70	76	87						81	
3 years after ADO	70	84	84	90	81	95	74	82							82	
4 years after ADO	85	88	84	95	81	100	78								87	

a. Demographic variables represent the characteristics of the population at the time of initial residency completion.

b. Not reported because of missing data.

15. Having one or two fewer or one or two more minority physicians can substantially affect ethnicity percentages because the average cohort size is only 22.4 physicians.

As shown in table 20, the average ADO associated with OB/GYN residencies ranged between 3.3 and 4.3 years between the FY 1987 and FY 2000 cohorts. Yearly fluctuations depend somewhat on the size of cohort and the mix of initial accession sources. The average ADOs of USUHS and AFHPSP direct accessions over this period were 5.9 and 3.5 years, respectively.

Cumulative attrition rates for these specialists averaged 5 percent before the completion of their ADO, 59 percent at completion, and 75, 81, 82, and 87 percent 1, 2, 3, and 4 years after completion. Examination of table 20 shows that cumulative attrition rates vary substantially from cohort to cohort, perhaps because of the small population size. Specifically, the highest cumulative attrition rate at completion of the ADO was 79 percent for the FY 1992 cohort and the lowest—27 percent—was for the FY 1997 cohort with an average of 59 percent.

The cumulative attrition rates for OB/GYN physicians before and after the obligation policy change were 66 and 45 percent, respectively, for a difference of 21 percentage points. As with general surgeons, this difference is statistically significant (at the 1-percent level). Hence, the cumulative attrition rate at ADO completion for OB/GYN physicians is lower after the obligation policy change than before it.

Orthopedic surgery

Between FY 1987 and FY 2000, an average of 21.6 Navy physicians completed initial residency training and became fully trained orthopedic surgeons. Annually the training output over this period has fluctuated between 16 and 30 specialists and there does not appear to be any identifiable upward or downward trend in the size of the training output (see table 21).

The average age at completion of residency training was 34.2 years between FY 1987 and FY 2000. Over this same period, the percentage that was male averaged 96 percent; there is no obvious upward or downward trend in the gender mix of these surgeons. These specialists had on average 2.1 dependents each and 86 percent were married. As with gender, there is no identifiable change in the ethnic mix of the training output between the FY 1987 and FY 2000 cohorts. Over

this period, ethnic mix has averaged 94 percent Caucasian, 1 percent black, 3 percent Asian, and 2 percent other ethnicities. Also, orthopedic surgeons averaged 5.5 YOS and 5.3 YOCS at the time their initial residencies were completed.

Table 21. Orthopedic surgery initial residency training output, ADO, board certification, and attrition, by fiscal year of initial residency completion (FY87-00)

	Fiscal year															Avg
	87	88	89	90	91	92	93	94	95	96	97	98	99	00		
Population	21	18	30	20	23	22	23	21	18	16	18	24	28	20	21.6	
Direct					3	1	2			1	1	1			0.6	
AFHPSP direct	11	12	10	10	11	9	10	7	11	11	8	10	8	9	9.8	
AFHPSP indirect						1	2		1	1	2	1	1		0.6	
AFHPSP NADDS	10	5	17	9	6	4	9	7	3		3	8	10	5	6.9	
AFHPSP recall					1	3					1	1	4	4	1.0	
USUHS			1	1	1	4		6	3	3	3	3	5	2	2.3	
Other		1	2		1			1							0.4	
Demographics ^a																
Average age	33	33	33	33	34	35	34	36	35	36	35	35	35	34	34.2	
Percent male	95	100	97	90	96	100	100	100	94	94	94	92	93	95	96	
No. of dependents	1.3	1.5	2.0	2.1	2.6	2.0	2.1	2.6	1.6	2.0	2.9	2.2	1.9	2.5	2.1	
Percent married	75	71	78	80	91	91	86	95	71	88	100	88	85	^b	86	
Ethnicity (percent)																
Caucasian	93	100	100	100	90	100	100	100	89	94	94	^b	^b	^b	94	
Black	0	0	0	0	0	0	0	0	0	6	0	^b	^b	^b	1	
Asian	0	0	0	0	5	0	0	0	6	0	0	^b	^b	^b	3	
Other	7	0	0	0	5	0	0	0	6	0	6	^b	^b	^b	2	
YOS	3.7	6.2	4.0	4.3	5.7	6.3	4.5	7.0	7.1	9.1	6.6	4.9	4.9	4.9	5.5	
YOCS	3.9	5.8	3.8	4.1	5.3	6.3	4.5	7.0	6.7	8.7	6.6	4.7	4.7	4.9	5.3	
ADO (years)	2.8	3.7	3.4	3.5	2.8	3.1	3.0	4.0	3.0	3.8	2.9	3.2	3.8	3.7	3.3	
Cum. attrition (%)																
Before ADO	5	6	3	5	0	5	0	5	6	0	0	8			4	
At ADO	86	61	60	70	48	68	70	58	44	55	75				63	
1 year after ADO	90	78	90	80	83	73	83	74	63	73					80	
2 years after ADO	90	83	90	85	83	86	83	74	69						83	
3 years after ADO	90	83	93	85	87	86	83	79							86	
4 years after ADO	90	83	93	85	87	86	87								88	

a. Demographic variables represent the characteristics of the population at the time of initial residency completion.
b. Not reported because of missing data.

As shown in table 21, the average ADO associated with orthopedic surgery residencies has ranged from 2.8 to 4.0 years between the FY 1987 and FY 2000 cohorts. Fluctuation in the average ADO is partly the result of the sample size and accession source differences among these cohorts. The average ADOs of USUHS and AFHPSP direct accessions over this period were 4.4 and 2.5 years, respectively.

Cumulative attrition rates for these physicians averaged 4 percent before the completion of their ADO, 63 percent at completion, and 80, 83, 86, and 88 percent 1, 2, 3, and 4 years after completion. Examination of table 21 shows that cumulative attrition rates vary substantially from cohort to cohort; this may be caused by the small population size. Cumulative attrition rates at ADO completion range from a low of 44 percent for the FY 1995 cohort to a high of 86 percent for the FY 1987 cohort, with average attrition rate of 63 percent. As with other specialties, there is no obvious upward or downward trend in the cumulative attrition rate between cohorts.

The cumulative attrition rates for orthopedic surgeons in the periods before and after the obligation policy change were 64 and 60 percent, respectively, for a difference of 4 percentage points. Unlike the other surgical specialties we examined—general surgery and OB/GYN—this difference is not statistically significant. Hence, we cannot say that attrition after the obligation policy change for orthopedic surgeons is better or worse than before it.

All surgical specialties combined

Now that we have looked at the attrition behavior of three individual specialties in the surgical specialties group, we will consider the attrition behavior of the group as a whole.

In FY 1987, 91 Navy physicians completed initial residency training and became fully trained specialists in surgical specialties. Recall that surgical specialties include general surgery, neurological surgery, OB/GYN, ophthalmology, otolaryngology, orthopedic surgery, and urology. Initial residency training output was as high as 121 specialists in FY 1990, but since that time, it has steadily declined to 72 specialists by FY 2000. The FY 2000 residency output is well below the average output of about 95 specialists per year between FY 1987 and FY 2000 (see table 22).

Table 22. Surgical specialties' initial residency training output, ADO, board certification, and attrition, by fiscal year of initial residency completion (FY87-00)

	Fiscal year															Avg
	87	88	89	90	91	92	93	94	95	96	97	98	99	00		
Population	91	100	114	121	100	107	104	91	80	83	91	81	91	72	94.7	
Direct	1	8	4	3	6	3	5	1	4	3	1	2	1		3.0	
AFHPSP direct	58	50	53	53	45	46	46	49	50	48	48	42	37	31	46.9	
AFHPSP indirect	3	5	4	3	4	9	2	3	4	5	7	1	6	1	4.1	
AFHPSP NADDs	26	27	42	51	24	27	32	19	8	12	18	23	23	17	24.9	
AFHPSP recall					2	4			2	5	6	4	10	9	3.0	
USUHS	1	6	7	8	13	16	16	16	9	9	10	9	13	14	10.5	
Other	2	4	4	3	6	2	3	3	3	1	1		1		2.4	
Demographics ^a																
Average age	32	33	33	33	33	34	34	34	34	34	34	34	34	34	33.6	
Percent male	90	85	96	91	95	94	93	88	83	88	79	77	76	75	87	
No. of dependents	1.8	1.8	1.9	2.0	2.2	2.0	2.1	2.1	1.7	1.9	2.0	1.6	1.6	2.5	1.9	
Percent married	83	78	82	76	88	81	82	87	78	84	77	80	77	^b	82	
Ethnicity (percent)																
Caucasian	93	93	97	97	95	97	97	91	91	95	89	92	77	91	93	
Black	3	4	2	3	1	1	1	4	5	2	2	5	5	5	3	
Asian	3	3	1	0	1	1	2	3	1	2	4	2	13	5	3	
Other	1	0	0	0	3	1	0	1	3	0	5	2	5	0	1	
YOS	4.6	4.9	4.4	4.1	4.8	5.0	5.3	5.8	6.5	6.3	5.6	5.1	4.9	6.2	5.2	
YOCS	4.6	4.8	4.3	3.8	4.7	4.9	5.1	5.7	6.2	6.1	5.5	5.0	4.7	5.6	5.0	
ADO (years)	3.4	3.4	3.2	3.5	3.3	3.4	3.3	3.6	3.3	3.2	3.5	3.5	3.6	4.0	3.4	
Cum. attrition (%)																
Before ADO	9	5	6	4	2	4	2	5	3	4	2	6			4	
At ADO	70	59	57	64	43	52	50	40	41	38	48				52	
1 year after ADO	80	73	71	76	68	65	66	54	60	60					68	
2 years after ADO	82	77	79	79	71	73	69	64	63						74	
3 years after ADO	85	79	82	81	74	77	70	66							77	
4 years after ADO	90	82	82	85	78	80	75								82	

a. Demographic variables represent the characteristics of the population at the time of initial residency completion.

b. Not reported because of missing data.

The average age at completion of residency training was 33.6 years between the FY 1987 and FY 2000 cohorts. Over this same period, the percentage that was male averaged 87 percent, declining from 90 percent in FY 1987 to 75 percent in FY 2000. On average, these specialists had 1.9 dependents each, and 82 percent were married. The ethnic

mix of the training output changed little between FY 1987 and FY 2000. Over this period, Caucasians accounted for 93 percent of initial residency output, blacks for 3 percent, Asians for 3 percent, and other ethnicities for 1 percent. Also, surgical specialties averaged 5.2 YOS and 5.0 YOCS at the time their initial residencies were completed.

As shown in table 22, the average ADO associated with residencies in surgical specialties increased from 3.4 to 4.0 years between the FY 1987 and FY 2000 cohorts. This increase is largely a function of the small number of USUHS accessions in the FY 1987 cohort compared to cohorts in later fiscal years. The average ADOs of USUHS and AFHPSP direct accessions over this period were 5.6 and 2.9 years, respectively.

Cumulative attrition rates for these physicians averaged 4 percent before the completion of their ADO, 52 percent at completion, and 68, 74, 77, and 82 percent 1, 2, 3, and 4 years after completion. Examination of table 22 shows that cumulative attrition rates vary substantially from cohort to cohort. For example, the cumulative attrition rate at ADO completion ranged from 38 percent for the FY 1996 cohort to 70 percent for the FY 1987 cohort. Given the yearly variation, there is no consistent upward or downward trend in the cumulative attrition rate for the cohorts between FY 1987 and FY 1997.

The cumulative attrition rates for specialists in surgical specialties before and after the obligation policy change were 59 and 44 percent, respectively, for a difference of 15 percentage points. This difference is statistically significant (at the 1-percent level), unlike the primary care specialties, which didn't have a significantly different attrition rate before and after the policy change. Hence, the cumulative attrition rate at ADO completion for specialists in surgical specialties is lower after the obligation policy change than before it.

Other specialties

Anesthesiology

In FY 1991 and FY 1992, 41 Navy physicians completed initial residency training and became fully trained anesthesiologists. Since that time, anesthesiology residency output has fallen 56 percent to 18 specialists

in FY 2000. Between FY 1987 and FY 1992, the number completing residencies in anesthesiology averaged 35 specialists per year compared to 23 specialists per year from FY 1993 through FY 2000 (see table 23).

Table 23. Anesthesiology initial residency training output, ADO, board certification, and attrition, by fiscal year of initial residency completion (FY87-00)

	Fiscal year														Avg
	87	88	89	90	91	92	93	94	95	96	97	98	99	00	
Population	32	27	37	32	41	41	29	22	20	23	37	17	20	18	28.3
Direct		1		2	1				3	1	1	1			0.7
AFHPSP direct	17	8	16	13	12	15	14	10	13	10	16	5	11	7	11.9
AFHPSP indirect	3	3	1	1	6	3	6	5	1	2	1	1	2	4	2.8
AFHPSP NADDS	11	11	12	12	14	13	5	3		3	10	2	1	2	7.1
AFHPSP recall					2	2			1		4	2	3	2	1.1
USUHS		3	5	4	6	4	3	4	2	7	5	6	3	3	3.9
Other	1	1	3			4	1								0.7
Demographics^a															
Average age	32	34	33	33	33	34	34	35	34	34	35	34	33	34	33.8
Percent male	84	93	95	94	95	98	100	95	85	78	92	94	75	83	91
No. of dependents	1.5	1.6	1.6	1.7	2.2	1.7	2.3	1.9	1.8	2.1	1.5	1.7	1.3	2.0	1.8
Percent married	74	69	70	68	83	80	79	77	84	86	62	83	88	^b	77
Ethnicity (percent)															
Caucasian	100	100	97	93	100	92	100	95	100	77	81	88	83	83	93
Black	0	0	3	3	0	5	0	0	0	5	7	0	0	11	3
Asian	0	0	0	0	0	3	0	0	0	18	11	6	6	6	3
Other	0	0	0	3	0	0	0	5	0	0	0	6	11	0	1
YOS	4.2	4.9	5.2	4.8	3.7	5.0	6.5	6.4	5.9	6.4	5.3	6.3	5.7	5.6	5.3
YOCS	3.5	4.7	4.9	4.1	3.4	4.7	6.2	6.4	5.7	5.9	4.9	5.6	5.7	5.2	4.9
ADO (years)	2.9	2.9	3.4	3.8	3.8	3.5	2.8	3.1	3.2	3.0	3.2	3.7	3.8	3.3	3.3
Cum. attrition (%)															
Before ADO	6	0	3	16	5	7	7	0	0	0	4	0			5
At ADO	72	67	65	75	63	68	64	24	53	55	40				61
1 year after ADO	88	93	89	78	73	80	64	43	68	65					76
2 years after ADO	94	93	89	78	78	83	79	48	79						81
3 years after ADO	97	93	89	81	78	83	82	48							83
4 years after ADO	97	96	89	84	80	85	89								88

a. Demographic variables represent the characteristics of the population at the time of initial residency completion.
b. Not reported because of missing data.

The average age at completion of residency training was 33.8 years between FY 1987 and FY 2000. Over this same period, the percentage that was male averaged 91 percent. These specialists had on average 1.8 dependents each, and 77 percent were married. The ethnic mix of the training output between the FY 1987 and FY 2000 cohorts has become more diverse. In FY 1987, minorities accounted for 0 percent of the residency output, compared to 17 percent in FY 2000. Also, anesthesiologists averaged 5.3 YOS and 4.9 YOCS at the time their initial residencies were completed.

As shown in table 23, the average ADO associated with anesthesiology residencies ranged between 2.8 and 3.8 years between FY 1987 and FY 2000. Fluctuations in average ADO depend somewhat on the mix of initial accession sources of the specialists in each cohort. The average ADOs of USUHS and AFHPSP direct accessions over this period were 5.3 and 2.7 years, respectively.

Cumulative attrition rates for these physicians averaged 5 percent before the completion of their ADO, 61 percent at completion, and 76, 81, 83, and 88 percent 1, 2, 3, and 4 years after completion. Examination of table 23 shows that cumulative attrition rates vary substantially from cohort to cohort; this may be a result of the small population size. Specifically, the cumulative attrition rate at ADO completion was lowest for the FY 1994 cohort (24 percent) and highest for the FY 1990 cohort (75 percent). In addition, the cumulative attrition rates between FY 1994 and FY 1997 are all below the average attrition rate at ADO completion of 61 percent. In contrast, the attrition rates before the FY 1994 cohort are all above the average. This may be evidence of a downward trend in attrition rates of anesthesiologists.

The attrition rates for anesthesiologists before and after the obligation policy change were 68 and 48 percent, respectively. This 20-percentage-point difference is statistically significant at the 1-percent level. Hence, the attrition rate at ADO completion for anesthesiologists is lower after the obligation policy change than before it.

Radiology

In FY 1988, 18 Navy physicians completed initial residency training and became fully trained radiologists. Between FY 1988 and FY 1994, the number completing residencies in radiology averaged 22 specialists per year and was only 11 in FY 2000. From FY 1995 through FY 2000, the average number of specialists completing radiology residencies dropped to less than 16 per year on average (see table 24).

Table 24. Radiology^a initial residency training output, ADO, board certification, and attrition, by fiscal year of initial residency completion (FY87-00)

	Fiscal year															Avg
	87	88	89	90	91	92	93	94	95	96	97	98	99	00		
Population	2	18	19	23	28	23	17	26	16	15	16	16	20	11	17.9	
Direct		1	1	1	2	1		2		2					0.7	
AFHPSP direct	1	9	10	13	9	11	10	12	8	9	8	13	9	6	9.1	
AFHPSP indirect			2	1	4	1		3	2		2			1	1.1	
AFHPSP NADDS	1	6	5	7	9	6	1	3	1	2	1	2	5	1	3.6	
AFHPSP recall					2	1		1					2		0.4	
USUHS		1	1		2	3	4	4	5	1	5	1	4	3	2.4	
Other		1		1			2	1		1					0.4	
Demographics^b																
Average age		34	33	34	34	34	34	35	34	37	34	34	34	34	34.2	
Percent male		72	89	100	96	96	88	85	88	80	100	81	85	82	88	
No. of dependents		1.9	1.9	1.7	2.0	1.9	1.9	1.6	1.7	2.1	3.0	2.4	2.1	2.4	2.0	
Percent married		82	84	68	86	78	82	88	75	79	93	93	86	^c	83	
Ethnicity (percent)																
Caucasian		100	93	100	96	95	100	100	100	93	100	93	76	89	95	
Black		0	7	0	0	5	0	0	0	7	0	7	0	0	2	
Asian		0	0	0	4	0	0	0	0	0	0	0	18	0	2	
Other		0	0	0	0	0	0	0	0	0	0	0	6	11	1	
YOS		5.8	5.8	5.6	5.1	4.9	7.4	6.8	7.8	7.5	7.2	6.3	7.2	6.5	6.3	
YOCs		5.6	5.5	5.4	5.1	4.9	7.4	6.4	7.6	7.2	7.2	6.3	7.0	6.5	6.2	
ADO (years)	3.2	2.4	3.5	3.1	3.2	3.5	3.7	3.6	2.8	3.3	2.9	2.9	3.9		3.2	
Cum. attrition (%)																
Before ADO		6	0	13	0	4	0	0	0	0	0	10			3	
At ADO		44	68	70	57	35	18	41	33	29	36				45	
1 year after ADO		56	79	74	79	65	41	82	60	57					67	
2 years after ADO		83	84	74	82	70	47	82	60						74	
3 years after ADO		89	84	78	86	74	59	86							80	
4 years after ADO		89	84	78	86	74	59								80	

a. The sample includes 225 diagnostic radiologists and 25 therapeutic radiologists.

b. Demographic variables represent the characteristics of the population at the time of initial residency completion.

c. Not reported because of missing data.

The average age at completion of residency training was 34.2 years between FY 1987 and FY 2000. Over this same period, the percentage that was male averaged 88 percent. These specialists had on average 2.0 dependents each, and 83 percent were married. The ethnic mix of the training output between the FY 1987 and FY 2000 cohorts was 95 percent Caucasian, 2 percent black, 2 percent Asian, and 1 percent other ethnicities. Also, radiologists averaged 6.3 YOS and 6.2 YOCS at the time their initial residencies were completed.

As shown in table 24, the average ADO associated with radiology residencies ranged from 2.4 to 3.9 years between the FY 1987 and FY 2000 cohorts. Annual differences in average ADOs depend on the initial accession source mix in each cohort. The average ADOs of USUHS and AFHPSP direct accessions over this period were 4.6 and 2.7 years, respectively.

Cumulative attrition rates for these physicians averaged 3 percent before the completion of their ADO, 45 percent at completion, and 67, 74, 80, and 80 percent 1, 2, 3, and 4 years after completion. Examination of table 24 shows that cumulative attrition rates vary substantially from cohort to cohort, perhaps because of the small population size. For example, the cumulative attrition rate at ADO completion was as low as 18 percent for the FY 1993 cohort and as high as 70 percent for the FY 1990 cohort. The cumulative attrition rate in each cohort between the FY 1988 and FY 1991 cohorts was above the average of 45 percent. In contrast, the cumulative attrition rate was always below the average between the FY 1992 and FY 1997 cohorts. Like anesthesiology, this may signal a downward trend.

The cumulative attrition rates for radiologists before and after the obligation policy change were 60 and 32 percent, respectively, for a difference of 28 percentage points. Similar to anesthesiology, this difference is statistically significant at the 1-percent level. Hence, the cumulative attrition rate at ADO completion for radiologists is higher after the obligation policy change than before it.

All other specialties combined

Now that we have looked at the attrition behavior of two individual specialties in the other specialties group, we consider the attrition behavior of the group as a whole.

In FY 1987, 73 Navy physicians completed initial residency training and became fully trained specialists in other specialties—aerospace medicine, anesthesiology, dermatology, emergency medicine, neurology, nuclear medicine, pathology, physical medicine, psychiatry, and radiology. Between FY 1987 and FY 1992, the number of physicians completing residencies in these specialties grew to as many as 128, but by FY 2000 it had fallen to 75 specialists (see table 25).

Table 25. Other specialties' initial residency training output, ADO, board certification, and attrition, by fiscal year of initial residency completion (FY87-00)

	Fiscal year															Avg
	87	88	89	90	91	92	93	94	95	96	97	98	99	00		
Population	73	92	90	103	119	128	98	91	75	81	94	79	83	75	91.5	
Direct	2	4	7	6	10	6	4	4	6	7	1	2	3		4.4	
AFHPSP direct	38	41	45	52	44	61	56	44	41	46	57	48	51	42	47.6	
AFHPSP indirect	7	5	3	7	16	8	11	11	6	6	3	3	4	6	6.9	
AFHPSP NADDs	21	29	26	28	28	26	8	6	2	6	11	7	8	11	15.5	
AFHPSP recall					6	5	1	2	3	3	4	4	5	6	2.8	
USUHS	2	10	6	7	13	15	13	20	14	12	18	14	12	10	11.9	
Other	3	3	3	3	2	7	5	4	3	1		1			2.5	
Demographics ^a																
Average age	32	34	34	34	34	34	35	36	35	35	35	35	34	34	34.3	
Percent male	82	84	86	92	92	91	92	87	88	80	86	82	75	76	86	
No. of dependents	1.3	1.8	1.6	1.9	2.0	1.8	2.1	1.8	1.8	1.7	1.9	1.9	1.7	1.9	1.8	
Percent married	68	79	72	73	84	77	88	83	82	78	73	79	82	^b	79	
Ethnicity (percent)																
Caucasian	98	99	95	97	96	93	97	96	99	88	93	90	80	88	94	
Black	0	1	4	2	1	6	3	0	1	5	4	4	3	6	3	
Asian	2	0	1	0	2	1	0	1	0	6	4	4	9	3	2	
Other	0	0	0	1	1	1	0	2	0	0	0	1	8	3	1	
YOS	4.2	5.3	5.5	5.4	5.1	5.8	7.2	7.7	6.9	6.8	6.5	6.3	6.7	5.7	6.1	
YOCs	3.9	5.2	5.2	5.0	4.9	5.4	6.9	7.0	6.6	6.3	6.3	5.8	6.6	5.6	5.7	
ADO (years)	3.0	3.0	3.0	3.5	3.3	3.3	3.1	3.8	3.5	3.0	3.3	3.4	3.1	3.4	3.3	
Cum. attrition (%)																
Before ADO	3	2	2	10	2	6	4	3	3	1	3	3			4	
At ADO	60	49	58	57	49	48	42	30	35	39	40				47	
1 year after ADO	73	64	77	66	66	64	53	55	54	51					63	
2 years after ADO	79	71	79	69	71	70	60	61	57						69	
3 years after ADO	81	74	80	71	75	72	65	62							72	
4 years after ADO	84	79	81	72	76	73	67								76	

a. Demographic variables represent the characteristics of the population at the time of initial residency completion.

b. Not reported because of missing data.

The average age at completion of residency training was 34.3 years between FY 1987 and FY 2000. Over this same period, the percentage who were male averaged 86 percent, declining from 92 percent in FY 1993 to 76 percent in FY 2000. On average, these specialists had 1.8 dependents each, and 79 percent were married. The ethnic mix of the training output between FY 1987 and FY 2000 has become more diverse. Minorities accounted for 2 percent of the FY 1987 residency cohort compared to 12 percent of the FY 2000 cohort. Also, other specialists averaged 6.1 YOS and 5.7 YOCS at the time their initial residencies were completed.

As shown in table 25, the average ADO associated with residencies in the other specialties group ranged from 3.0 to 3.8 years between the FY 1987 and FY 2000 cohorts, with an average of 3.3 years. Variation in the ADO between cohorts is affected by the initial accession source mix of the cohort. While AFHPSP direct accessions were the predominant accession source in each cohort, USUHS accessions accounted for a higher percentage of the cohort in the later years than in the earlier ones. The average ADOs of USUHS and AFHPSP direct accessions over this period were 5.2 and 2.8 years, respectively.

Cumulative attrition rates for these physicians averaged 4 percent before the completion of their ADO, 47 percent at completion, 63 percent 1 year after completion, 69 percent 2 years after, 72 percent 3 years after, and 76 percent 4 years after completion. Table 25 shows that cumulative attrition rates vary substantially from cohort to cohort. The cumulative attrition rate at ADO completion was the lowest for the FY 1994 cohort (30 percent) and the highest for the FY 1987 cohort (60 percent). Since the FY 1993 cohort, the cumulative attrition rate at ADO completion has been at or below the average attrition rate for all cohorts of 47 percent.

The cumulative attrition rates for specialists in other specialties before and after the obligation policy change were 54 and 38 percent, respectively. As with specialists in surgical specialties, these cumulative attrition rates are statistically different (i.e., significant at the 1-percent level). Hence, the cumulative attrition rate at ADO completion for these specialists is higher after the obligation policy change than before it.

All specialties combined

Now that we have looked at the attrition behavior of eight specialties in the three major specialty groups, we consider the attrition behavior of all specialists combined. Between FY 1987 and FY 2000, an average of 301 Navy physicians completed initial residency training and became fully trained specialists. Residency output was as low as 250 specialists in FY 1995 and as high as 357 in FY 1990 (see table 26).

Table 26. All specialties' initial residency training output, ADO, board certification, and attrition, by fiscal year of initial residency completion (FY87-00)

	Fiscal year															Avg
	87	88	89	90	91	92	93	94	95	96	97	98	99	00		
Population	287	323	301	357	344	340	286	269	250	276	312	277	292	301	301	
Direct	3	18	15	16	23	13	11	9	13	12	3	8	6	2	11	
AFHPSP direct	161	164	151	179	163	180	164	161	154	181	191	161	155	150	165	
AFHPSP indirect	23	20	18	21	37	27	22	15	16	14	14	6	10	9	18	
AFHPSP NADDS	83	89	81	104	54	53	40	25	11	20	44	54	60	72	56	
AFHPSP recall					8	10	3	6	11	12	13	11	18	28	9	
USUHS	8	23	23	27	43	45	35	45	36	34	44	36	42	38	34	
Other	9	9	13	10	16	12	11	8	9	3	3	1	1	2	8	
Demographics^a																
Average age	32	33	33	33	34	34	34	34	34	34	33	34	33	34	33.4	
Percent male	84	85	89	92	93	91	90	82	83	78	80	77	70	71	84	
No. of dependents	1.6	1.7	1.7	2.0	2.0	1.8	2.1	1.8	1.7	1.6	1.8	1.7	1.5	2.0	1.8	
Percent married	78	77	78	76	83	79	83	84	77	76	76	79	77	^b	80	
Ethnicity (percent)																
Caucasian	95	95	96	96	95	94	95	94	94	91	92	92	83	89	93	
Black	2	3	3	2	1	4	2	2	4	3	3	4	3	5	3	
Asian	2	1	2	1	2	1	2	2	0	4	3	3	10	4	3	
Other	0	0	0	1	2	1	1	2	2	1	3	1	5	2	1	
YOS	4.2	4.7	5.1	4.7	5.5	5.5	6.1	6.1	5.8	5.8	5.4	5.2	5.5	5.5	5.3	
YOCS	4.1	4.6	4.9	4.4	5.2	5.2	5.7	5.7	5.5	5.5	5.2	4.9	5.3	5.1	5.1	
ADO (years)	3.2	3.1	3.2	3.6	3.3	3.3	3.3	3.5	3.5	3.5	3.5	3.6	3.4	3.7	3.4	
Cum. attrition (%)																
Before ADO	5	3	4	7	2	4	3	4	5	3	2	7			4	
At ADO	57	45	45	52	40	45	44	36	37	39	41				44	
1 year after ADO	70	60	61	63	58	60	58	54	55	53					60	
2 years after ADO	74	64	68	66	62	68	62	61	57						65	
3 years after ADO	77	69	71	69	65	70	65	63							69	
4 years after ADO	82	73	73	73	68	73	68								73	

a. Demographic variables represent the characteristics of the population at the time of initial residency completion.

b. Not reported because of missing data.

Between FY 1987 and FY 2000, the average age at completion of residency training was 33.4, and the percentage that was male averaged 84 percent—declining from 93 percent in FY 1991 to 71 percent in FY 2000. On average, these specialists had 1.8 dependents each, and 80 percent were married. The ethnic mix of the training output between FY 1987 and FY 2000 became more diverse. Minorities accounted for 5 percent of the FY 1987 residency cohort, compared to 11 percent of the FY 2000 cohort. These specialists averaged 5.3 YOS and 5.1 YOCS at the time their initial residencies were completed.¹⁶

As shown in table 26, the average ADO associated with residencies increased from 3.2 to 3.7 years between the FY 1987 and FY 2000 cohorts. This increase is largely a function of the small number of USUHS accessions in the FY 1987 cohort compared to the FY 2000 cohort. The average ADOs of USUHS and AFHPSP direct accessions over all cohorts were 5.7 and 3.0 years, respectively.

Cumulative attrition rates for these physicians averaged 4 percent before the completion of their ADO, 44 percent at completion, and 60, 65, 69, and 73 percent 1, 2, 3, and 4 years after completion. Examination of table 26 shows that cumulative attrition rates vary from cohort to cohort. The cumulative attrition rate at ADO completion was as low as 36 percent for the FY 1994 cohort and as high as 57 percent for the FY 1987 cohort.

The cumulative attrition rate at ADO completion was 48 percent in the before period compared to 40 percent in the after period. The 8-percentage-point difference between these two periods is statistically significant (at the 1-percent level). Hence, the cumulative attrition rate of fully trained specialists is less now than it was before the policy change. Note that this percentage-point difference is less than with surgical or other specialties because this difference is affected by primary care specialties, which had no significant difference in the attrition rate between the two periods.

16. The demographics of those who attrited and those who remained in the Navy are not significantly different—not only for all specialties as a whole but for the various specialties and specialty groups we studied.

Cumulative attrition rates

The analysis of attrition rates in the preceding sections shows that:

- Attrition rates are highly variable from year to year.
- Attrition rates (at ADO completion) after the April 1988 obligation policy change are lower than before it for all specialists combined.¹⁷

Given yearly variation in attrition rates at ADO completion, this section extends the analysis by looking at cumulative attrition rates 1 and 2 years after ADO completion. (The preceding sections compared cumulative attrition rates at ADO completion.) Table 27 presents these cumulative attrition rates.

Table 27. Cumulative attrition rates 1 or 2 years after ADO completion both before and after April 1988 obligation policy change by specialty^a

Specialty	Cumulative attrition rate (percent)					
	1 year after ADO completion			2 years after ADO completion		
	Before policy change	After policy change	Difference	Before policy change	After policy change	Difference
All specialties	62	55	-7^b	67	60	-7^b
Primary care	49	53	+4	53	57	+4
Family practice	54	57	+3	57	65	+8
Internal med.	46	43	-3	52	45	-7
Pediatrics	54	71	+17 ^c	60	72	+12
Surgical	74	60	-14^b	78	66	-12^b
General surgery	66	43	-23 ^b	72	51	-21 ^b
OB/GYN	77	70	-7	80	76	-4
Orthopedic surg.	85	74	-11 ^c	87	76	-11 ^d
Other	69	53	-16^b	73	59	-14^b
Anesthesiology	83	60	-23 ^b	86	69	-17 ^b
Radiology	72	62	-10	81	65	-16 ^c

a. The before period is for FY87-91 residency cohorts; the after period is for FY93-95 (for the 2 years after ADO completion figures) and for FY93-96 (for the 1 year after ADO completion figures).

b. Significant at the 1-percent level.

c. Significant at the 5-percent level.

d. Significant at the 10-percent level.

17. Only in the case of pediatrics was the attrition rate at ADO completion significantly higher after the policy change than before it.

Overall, the cumulative attrition rate after the obligation policy change is significantly lower than before it. Specifically, the cumulative attrition rate for all specialties 2 years after ADO completion was 7 percentage points lower after the policy change than before it. Also, this same attrition rate for surgical specialties and other specialties improved by 12 and 14 percentage points, respectively.

As for individual specialties, general surgery, orthopedic surgery, anesthesiology, and radiology each had significantly lower cumulative attrition rates 2 years after ADO completion after the obligation policy change than before it. But, for family practice, internal medicine, pediatrics, and OB/GYN, this same attrition rate was not significantly different in the before and after periods.

Clearly the obligation policy has altered attrition patterns by increasing attrition before residency and decreasing attrition after it. This is also a potential explanation for why overall attrition rates have not increased despite widening military-civilian pay gaps [2, 3].

Specialty training pipeline sizes

Difficulty filling billets doesn't automatically mean that the Navy has a retention problem or that retention is declining. It could be a retention problem or perhaps an accession or training output problem. Earlier sections focused on studying retention patterns of new accessions and fully trained specialists. Here we look at whether changes in the size of the residency output can explain changes in specialty inventories and the distribution of physicians across specialties.

To do this, we look at trends in initial residency training output by specialty to see whether they have changed over time. We also compare these numbers to changes in the number of fully trained duty physicians by specialty. Table 28 presents this comparison.

Between FY 1987 and FY 2000, the average age at completion of residency training was 33.4, and the percentage that was male averaged 84 percent—declining from 93 percent in FY 1991 to 71 percent in FY 2000. On average, these specialists had 1.8 dependents each, and 80 percent were married. The ethnic mix of the training output between FY 1987 and FY 2000 became more diverse. Minorities accounted for

5 percent of the FY 1987 residency cohort, compared to 11 percent of the FY 2000 cohort. These specialists averaged 5.3 YOS and 5.1 YOCS at the time their initial residencies were completed.¹⁸

Table 28. Changes in initial residency output and force size by specialty (FY90-00)

Specialty	Number completing initial residency		Percent change	Number of fully trained physicians ^a		Percent change
	FY90	FY00		FY90	FY00	
All specialties	357	301	-16	1,641	1,916	+17
Primary care	127	142	+12	557	759	+36
Family practice	64	70	+9	224	402	+79
Internal med.	35	31	-11	120	116	-3
Pediatrics	19	29	+53	160	175	+9
Surgical	121	72	-40	520	507	-3
General surgery	33	16	-52	148	104	-30
OB/GYN	21	19	-10	101	138	+37
Orthopedic surg.	20	20	0	98	109	+11
Other	103	75	-27	564	650	+15
Anesthesiology	32	18	-44	138	122	-12
Radiology	23	11	-52	101	93	-8

a. We didn't include fully trained subspecialists in internal medicine or general surgery subspecialties because these specialties are a result of additional, not initial, residency programs. We also excluded nuclear medicine specialists because no physicians completed initial residency programs in this specialty during these years.

Specifically, the number of fully trained physicians in the specialties included in this study increased 17 percent from 1,641 in FY 1990 to 1,916 in FY 2000, but the change over this period was not constant across specialties or specialty groups.¹⁹ During this time, primary care

18. The demographics of those who attrited and those who remained in the Navy are not significantly different—not only for all specialties as a whole but for the various specialties and specialty groups we studied.

19. The numbers of specialists in table 28 don't necessarily match the numbers that were listed in tables 1 and 2. The reason for the difference is that the numbers shown in table 28 don't include specialists in internal medicine (IM) and general surgery (GS) subspecialties and nuclear medicine. These were excluded because no specialist completed an initial residency in nuclear medicine in these years, and the IM and GS subspecialties are a result of second, not initial, residency programs.

specialists increased 36 percent, while surgical specialties decreased 3 percent and other specialists increased 15 percent.

As for individual specialties, some increased substantially while others decreased. For instance, family practice increased 79 percent from 224 specialists in FY 1990 to 402 specialists in FY 2000, and the number of general surgeons decreased 30 percent from 148 in FY 1990 to 104 in FY 2000.

The number of physicians completing initial residency programs provides some indication of future trends in inventory. If retention is unchanged, the Navy can only maintain its current inventory if the number of specialists retained from each residency cohort equals the number who retire. Therefore, changes in the size of initial residency cohorts is one indication of the Navy's future inventory. If the number completing residencies declines, we expect that the number of fully trained specialists will eventually decline as well once these new specialists move through the system.

For example, the number who completed initial residencies in general surgery declined from 33 in FY 1990 to 16 in FY 2000. Given this change in training output, it is not surprising that the number of fully trained general surgeons in the Navy declined from 148 to 104 over the same period. Clearly, the decline is not wholly a retention issue because the number going into the pool of general surgeons has also declined. We see similar trends in internal medicine, anesthesiology, and radiology (see table 28).

Findings

The following are our findings regarding historical changes in the Navy medical corps between FY 1987 and FY 2000:

- The study has focused on historical trends in retention since FY 1987. Although we observe an increase in attrition before residency and a decrease following it, we haven't made any judgment as to whether attrition is good or bad. Making such a judgment is outside the scope of this study.

- Comparing the FY 2000 Navy medical corps to itself in FY 1987, we observe that the average Navy physician is older, the percentage that is male has decreased, and the corps is more ethnically diverse.
- The mix of specialists between FY 1987 and FY 2000 has shifted: primary care and other specialties now make up a slightly larger percentage of the corps. However, individual specialties (e.g., family practice, preventive/occupational medicine, aerospace medicine, and emergency medicine) have increased substantially over this period. At the same time, such specialties as internal medicine and general surgery have declined. These changes in the specialty mix represent the national movement toward managed care.
- Overall, the paygrade distribution of the Navy medical corp is largely unchanged, but for some specialties, such as aerospace medicine, neurology, otolaryngology, and pathology, it has changed substantially.
- The percentage of board-certified physicians in surgical specialties is higher in the civilian sector than in the Navy.
- Retention patterns are significantly different after the April 1988 obligation policy change than they were before it for both the new AFHPSP direct accessions and new specialists. The differences are as follows:
 - The percentage of AFHPSP direct accessions that eventually became residents (and by definition specialists) is about 14 percentage points less after FY 1988 than before it. The percentage matriculating into residencies has been roughly the same—about 64 percent since FY 1988 compared to 78 percent for the FY 1987 and FY 1988 cohorts.
 - Cumulative retention of fully trained specialists 2 years after ADO completion is 7 percentage points higher following the April 1988 obligation policy change than before it. For primary care specialists, however, this retention figure is not significantly different between the two periods.

- The policy change hasn't significantly affected retention patterns of USUHS and fully deferred AFHPSP accessions.
- The combination of lower initial retention of new accessions and the higher retention of fully trained specialists explains why overall continuation rates have remained stable despite widening military-civilian pay gaps.
- Overall, the number of physicians completing initial residency programs in FY 2000 is 16 percent less than in FY 1990. Also, the number of physicians completing residencies in primary care specialties has increased 12 percent over this period, while the number of physicians completing residencies in surgical and other specialties has declined 40 and 27 percent, respectively.

Recommendations

Given the findings just reported, we make the following recommendations in relation to retention:

- The Navy needs to continue to improve its personnel planning process in terms of how it plans to fill future billets. For instance, a 4-year AFHPSP direct accession that spends 1 year as an intern, 2 years as a PCMO, and 4 years as a resident will have 7 years of service by the time he/she is a fully trained specialist. Hence, inability to fill billets now may well have been an accession problem 7 years ago (11 if you consider the 4 years as a medical student). Because of the time it takes to grow a specialist in-house, the personnel planning process needs to ensure that the number of physicians in the pipeline is sufficient to meet the Navy's needs.
- We recommend that a study be conducted to identify the best, or optimal, attrition rate. This will require an in-depth analysis of what attrition rate will provide the least costly way for the Navy to fill its billets. In short, what attrition rate would provide the lowest life-cycle cost. Clearly, a 95-percent retention rate is not best if the Navy has to pay extremely high wages to retain its physicians. Similarly, a 5-percent retention rate will also be very costly given the high cost of putting officers through medical

school. Essentially, this study would weigh the tradeoff between the cost of accessions with the cost of increasing retention by paying higher wages.

- We recommend that, in conjunction with the optimal attrition rate study, a study be conducted comparing the life-cycle costs of the various accession sources. Clearly, retention rates vary significantly by accession source, as does the investment made in physicians from each accession source. This study should compare the cost of meeting the desired experience profile of the medical corps through the various accession sources to find the mix of accession sources that minimizes life-cycle costs.

We now turn to our analysis of civilian-sector graduate medical education, physician recruitment, and physician retention to provide some comparison to our analysis of Navy physicians.

Civilian-sector practices

The Navy relies heavily on subsidized accession programs, such as AFHPSP and USUHS, to initially attract qualified applicants into the service. Moreover, the military departments access most of their specialists by providing them in-house graduate medical education (GME) training opportunities or deferring AFHPSP accessions until they complete specialty training.

This portion of the study reviews physician GME in the United States, physician recruitment, and physician retention strategies for the civilian sector. The first section examines the GME process, specifically related to the residency application and matching proceedings and compensation incentives for selected residency programs. Next, we discuss physician recruitment strategies, the 2000 physician market, typical employment incentives, and physician employment demographics. Finally, we look at the physician turnover rates, reasons why physicians leave their practices, and physician retention.

It is important for DoD and Navy policy-makers to better understand civilian practices because they may become reliant on this process to fill short-term gaps in military-physician specialties. Moreover, it provides DoD and the Navy a better understanding of the strengths and weaknesses of their own programs when recruiting qualified applicants from the civilian sector.

Graduate medical education

The education and training process to become a physician takes many years, typically 4 years of undergraduate school, 4 years of medical school, and 3 to 8 years of graduate training, depending on the specialty selected. On completion of their medical school education, physicians obtain their Doctor of Medicine (MD) or Doctor of Osteopathic Medicine (DO) degrees and are eligible in most states to receive their medical license and practice general medicine after just

1 year of postgraduate training. The vast majority of these physicians, however, pursue a full course of graduate training before practicing medicine. This formal training period is called a "residency."

Before applying and interviewing at various residency programs, it is important that senior-year medical students understand the training requirements, the career possibilities, and lifestyle realities of the specialty chosen. The geographical location of a residency program is carefully considered by students because many physician specialists tend to practice in the state where they completed their residency training. Studies have indicated that there is a positive correlation between location of training and location of practice. Nationally, 51 percent of physicians are practicing in the state where they obtained their graduate medical education. Primary care physicians are more likely than specialists to practice in the state where they obtained their residency training [9].

Educational indebtedness also influences specialty choice. According to Woodworth et al., both surgical and primary care residents have significant debt, although surgical residents have greater financial debt than primary care residents because of training length. However, the anticipation of indebtedness was a more significant factor in determining the career path for primary care than for surgical residents [10].

According to the American Medical Association (AMA), debt has been steadily rising; the average debt of graduating medical students increases about 5 to 7 percent per year. From 1985 to 2000, the average debt of all indebted graduates increased 211 percent. Eighty-three percent of medical students graduated with debt. Of these, the average debt was \$93,000 (about \$80,000 for graduates of public medical schools and \$115,000 for graduates of private schools). Of all students with debt, 29 percent owed \$100,000 or more [11].

Newly graduated physicians from medical school generally have three different means of residency application:²⁰

20. The Armed Forces also have a matching program for graduating AFHPSP and USUSHS medical students. See [3] for details.

- The National Resident Matching Programs (NRMP)
- Advanced Specialty Programs (neurology, neurosurgery, ophthalmology, otolaryngology, plastic surgery, and urology) with their own matches
- Programs that select their residents from a direct application process (i.e., nuclear medicine).

The Match is a way to bring together residency applicants and residency programs in an organized fashion. After applying to and interviewing at various residency programs, in their specialty of choice, senior-year medical students submit a "rank order list," which specifies their preferences for programs in numerical order. Residency programs across the nation submit similar lists. After the lists are received, a computer matches applicants and programs. Usually in mid-March (Match day) of each year, all applicants across the country receive an envelope telling them where they will be spending the next several years. Advance specialty programs, U.S. Armed Forces, and direct match programs may have different match days for applicants.

The NRMP fills the vast majority of positions for graduate medical training. The NRMP is administered by the Association of American Medical Colleges. Applicants must meet the requirements established by the Accreditation Council for Graduate Medical Education to enroll in the NRMP. In the 2000 match, 32,274 NRMP applicants competed for 22,722 residency positions.

Ninety-two percent (14,427) of the 15,681 U.S. medical school graduates in 2000 participated in the NRMP to obtain postgraduate year-one (PGY-1) residency positions. In addition to these U.S. medical school graduates, another 17,847 "independent" NRMP applicants competed for these positions. The majority (20,598) of the residency positions offered were PGY-1 appointments. The remaining positions (2,124) were PGY-2 programs [12].

Most residency programs accept medical school graduates right after completion of medical school, such as family practice, internal medicine, pediatrics, pathology, obstetrics and gynecology, and general surgery. For some specialties, however, a year of postgraduate training is required before beginning a residency in that field. Many who want

to go into such fields as anesthesiology, radiology, ophthalmology, and psychiatry fill the requirement with a transitional- or a preliminary-year program. Transitional-year programs are designed to provide broad clinical experience for those physicians who have not chosen a given specialty or think it will provide a strong foundation for subsequent GME.

An alternative to the transitional year is the preliminary year. Preliminary years come in two tracks, internal medicine and surgery. These programs require a year of postgraduate education before beginning residency and may accept either a transitional year or a preliminary year. Such tracks are 1 to 2 years of introductory clinical medicine that may serve as a prerequisite for additional postgraduate medical education in other disciplines. Another reason a new physician would choose to complete a preliminary or transitional year is that he or she did not match into the specialty of choice. The hopeful applicant then takes a preliminary or transitional year in hopes of improving his/her chances and qualifications for next year's residency match.

The first year of a physician's residency program is often referred to as an internship. This is followed by the core period of residency training. Finally, many residents choose to enter fellowships, which sometimes are referred to as post-residency training or subspecialization (i.e., cardiology or plastic surgery). In general, the surgical specialties require longer residencies and the primary care residencies the least time. Table 29 details by specialty the duration of residency programs [13].

The majority of U.S. medical school senior-year students will match with one of their top choices. In fact, more than 62 percent of the U.S. seniors in the 2000 Match obtained their first choices, while 15 percent matched their second choice [13]. Applicants and hospitals matched through the NRMP are contractually bound to one another. Hospital programs are committed to offer an official appointment to each matched applicant who has met their prerequisites and institutional employment conditions, and applicants are committed to enter the positions into which they have been matched.

Table 29. Overview of training duration for selected residencies

Postgraduate year (PGY 1)	PGY 2	PGY 3	PGY 4	PGY 5	PGY6-7
Family practice					
Emerg. med.					
Pediatrics					
Internal med.					
OB/GYN					
Pathology					
General surg.	General surg.				
Transitional or preliminary medicine or preliminary surgery					

Residency programs

Graduate medical education is the process for providing academic and clinical education after medical students have graduated from an accredited medical school. GME typically occurs in teaching hospitals or other health care settings, which provide the advanced training of physicians. Most of these hospitals are tertiary care institutions that provide highly advanced and complex levels of medical care. During residency, physicians practice under the supervision of faculty physicians, generally in large medical centers. The Veterans Administration (VA) is the largest single provider of GME training sites in the country. Annually, the VA provides medical training to more than 32,000 residents in about 130 VA facilities. About one-third of all residents in the United States receive a portion of their training in the VA health system every year [14]. Table 30 summarizes nationwide

residency program statistics collected by the AMA for selected specialties [15].

Table 30. Summary of nationwide program statistics for CY 2000 for selected specialties

	Specialty ^a							
	AN	CD	FP	GI	IM	OS	PD	RA
Accredited programs	132	181	501	154	394	152	209	195
Years of required training	3 / 4	3	3	3	3	4 / 5	3	4
Min. no. of prior years required	1 / 0	3	0	3	0	1 / 0	0	1 / 0
Start immediately after medical school completion	No	No	Yes	No	Yes	No	Yes	No
Total active residents/fellows	4,170	1,951	10,127	889	21,173	2,915	7,629	3,641
Percentage of females	29.1%	14.3%	46.9%	13.8%	39.1%	7.4%	64.3%	24.9%

a. AN = anesthesiology; CD = cardiology; FP= family practice; GI= gastroenterology; IM = internal medicine; OS = orthopedic surgery; PD = pediatrics; RA = radiology (diagnostic).

Resident hours

Residency program hours vary widely depending on specialty, hospital, and hospital department. Some specialties have less demanding hours during residency and often afterwards. These so-called lifestyle fields include radiology and anesthesiology. Specialties whose residencies are reputed for difficulty and lack of sleep include general surgery and obstetrics and gynecology. Most of the other fields are in between. Surgical and internal medicine residents may routinely work 100+ hours a week, with some months requiring every other night on call. Most on-call time is scheduled every third or fourth night. There are a few states that limit the number of hours that a resident can work; the most prominent is New York. New York's law limits residents to 80 hours a week over a 4-week period with shifts of less than 24 hours. Table 31 displays the average hours per week and the maximum consecutive hours on duty for selected residency programs around the country [16]. Internal medicine and orthopedic surgery residency programs average about 70 hours of duty per week, whereas radiology and anesthesiology residency programs average less than 60 hours of duty per week.

Table 31. Selected specialties and residency programs (2000): average hours of duty per week/maximum consecutive hours on duty

Program	Anesthesiology	Radiology	Orthopedic surgery	Internal medicine
University of Alabama	65/24	50/26	60/36	76/24
UCLA	50/25	50/24	72/24	60/28
University of Colorado	60/24	60/24	60/36	60/18
University of Indiana	80/24	50/15	60/36	60/33
University of Maine	70/24	40/24	N/A	55/30
NY University	60/24	52/24	N/A	50/24
Duke University/NC	65/34	50/27	80/36	80/24
Health Sciences/Oregon	70/24	50/24	70/36	70/32
University of Texas	60/24	44/40	60/36	70/24
All programs	59/ 24	49/22	68/30	70/29

Residency compensation

For the most part, residency compensation is standard across the country. However, programs attempting to attract residents will often offer salaries higher than those offered by programs that have no difficulty in attracting the candidates they want. Salary differences may also be found in large metropolitan cities where the cost of living is higher. Most programs set residency stipends by the number of completed postgraduate years regardless of specialty.

When comparing residency compensation data, it is important to understand that, for some specialty programs, a minimum number of years are required before acceptance into the program. A preliminary or transitional year or a completed residency program (i.e., internal medicine) are the typical prerequisites. For example, cardiology residency programs require a minimum of 3 years of training (usually in internal medicine) before specializing. Therefore, a first-year resident in a cardiology program (sometimes referred to as a fellowship program) is actually a physician's fourth postgraduate year. In contrast, the first year of an orthopedic residency program is actually a physician's second postgraduate year.

Table 32 displays selected first-year salaries of programs by specialty for various geographic regions across the country [16]. Salary comparisons

can be made within each specialty and among the specialty programs of anesthesiology, radiology, and orthopedic surgery given that the physicians entering these programs are typically in their second postgraduate year. However, the internal medicine first-year resident data cannot be compared directly with these specialties because the first-year internal medicine resident is in the first postgraduate year.

Table 32. Selected first-year residency salaries (2000)

State	Facility	Salary (\$) by specialty			
		Anesthesiology ^a	Radiology ^a	Orthopedic surgery ^a	Internal medicine ^b
AL	University of AL	35,913	35,913	34,713	34,713
CA	UCLA	37,300	36,600	N/A	32,700
CO	University of CO	35,112	35,112	32,340	34,400
IN	University of IN	35,974	35,974	35,974	36,538
ME	University of ME	36,914	39,872	N/A	38,021
NC	Duke University	35,250	36,750	35,250	34,050
NY	NY University	42,863	42,863	N/A	42,370
OR	Health Science Ctr.	34,476	34,476	33,648	33,648
TX	University of TX	32,888	34,366	33,130	33,130
All	Average of programs	36,390	37,533	35,632	35,984

a. Requires 1 prior year.

b. Requires no prior years.

Table 33 displays cash compensation for Kaiser Permanente and the University of Illinois at Chicago accredited programs by postgraduate year [17-18]. Each year the stipends are reviewed and adjusted if necessary. For example, the University of Illinois at Chicago approved a 3-percent increase in residency stipends for 2001-2002. Table 33 also compares the residency stipends to the average compensation of military residents. *Note that the compensation for uniformed residents and fellows exceeds that of their civilian counterparts for every specialty* [3]. In the first postgraduate year, for example, the average military resident's cash compensation is \$13,320, or 39 percent higher than the stipend at the University of Illinois at Chicago. Similarly, in the seventh postgraduate year, the difference is \$31,921, or 74 percent.

Table 33. Resident stipends (in dollars) for selected programs (2000-01)

Postgraduate Year (PGY)	Kaiser Permanente		University of Illinois at Chicago	Average military resident ^a
	Southern California	Northern California		
1	33,057	33,888	33,996	47,316
2	35,815	37,584	35,700	51,116
3	38,573	40,668	37,152	54,361
4	41,888	43,932	38,904	57,104
5	44,625	46,764	40,596	60,128
6	47,383	48,060	41,568	67,128
7	N/A	N/A	43,392	75,313

a. Average cash compensation for military residents includes regular military compensation (RMC) and variable special pay (VSP). RMC and VSP figures are for FY 2000. See reference [19].

In addition to cash compensation, residents are considered employees of the hospital or medical institution and generally enjoy the same benefits as other workers. Highlights of group benefits offered to residents at Kaiser Permanente and University of Illinois include those listed in table 34. Typical benefits offered to residents include health care, disability, and group life insurance at a nominal fee. Dependent coverage is also available at an additional cost. Residents receive about 3 weeks of vacation each year and the opportunity to participate in retirement and tax-deferred annuities. Other benefits include annual sick leave, parental leave, paid malpractice coverage, free parking, and free meals on selected shifts. Tuition waivers are also available to residents for qualified educational classes.

Additional forms of compensation may be available for residents. Some residency programs may offer bonus packages, usually to assist in the repayment of student loans. These may be offered in the form of loan repayment, where the loans are paid directly by the institution, or as lump-sum incentive payments or as a monthly payment over the 12-month staff year. Some programs offer outright financial incentives with no specific purpose attached. This can be a result of the location of the residency and the limited amenities in the surrounding area. In some cases, relocation costs are paid as part of an incentive package to attract medical school graduates to residency, but this is not the usual scenario.

Table 34. Group benefits: Kaiser and the University of Illinois (2000-01)

Benefit category	Kaiser Permanente	Univ. of Illinois at Chicago
Health care	Medical and major dental	Medical and dental
Holidays and vacation	7 per year 3 weeks per year	7 per year 20 days per year
Disability		
Short-term	+	
Long term		+
Group life Insurance	+	+
Retirement/tax-deferred annuities	+	+
Other benefits		
Sick leave (annual)	+	24 calendar days
Parental leave	+	+
Education (conferences, etc.)	(Y4)	+
Paid malpractice	+	+
On-call sleeping facilities	+	+
Free parking	+	+
Laundered coats/scrubs	+	+
Free meals	While on duty or call	Rotating nights/ weekend call
Tuition waiver	+	+
Dependent care		+

Additional incentives include states offering a range of scholarship and loan repayment programs intended to encourage a small number of physicians to practice in medically underserved areas. Many states with few or unfilled primary care residencies are offering loan repayment incentives to medical students who select in-state primary care residencies. Such initiatives are viewed as effective because the site of residency is thought to be a strong predictor of practice location. To discourage default, most states levy strong penalties on students who do not meet their obligations.

Moonlighting is another form of compensation available to residents. Moonlighting refers to the employment of resident physicians during the hours they are not serving in the training programs. Moonlighting cannot take place until after the first year of residency, when physicians complete the final requirements for licensure. Some programs forbid moonlighting or place restrictions on the amount a resident can perform. Residents who can moonlight can substantially

increase their annual income, but this may affect the resident's eligibility for an economic hardship deferment.

Physician recruitment strategies

The recruitment of a new physician out of a residency program usually takes 9 to 12 months in urban areas and much longer in rural and medically underserved communities. Most practices recruit locally where physicians were residents or from teaching hospitals near their offices. It is not uncommon for residents to locate their new practice close to where they performed their residency programs. Individual factors that are significantly related to where a physician will locate their practice include the following:

- Size of community where the physician grew up
- Size of community where the physician's spouse was raised
- Size of the physician's high school graduating class
- Number of contacts with other physicians
- Availability of continuing medical education opportunities
- Professional growth opportunities
- Availability of medical facilities [20].

Hospitals tend to assist local medical groups with recruitment costs, in many cases paying for the entire recruitment effort (advertise, recruit personnel, and provide a financial incentive, such as an income guarantee). In return, medical groups offer a favorable setting to new physicians—an alternative to going to a solo practice. In addition, local medical groups, hospitals, and medical societies have strong network ties with residency programs to help identify potential candidates for employment. Rural areas face additional challenges when recruiting physicians. We will address those challenges later in this section.

Most hospitals and medical groups have established formal physician recruitment plans for new physicians whether just out of residency or with several years of experience. Investing in a new (or established)

physician is time-intensive and expensive. Medical practices or hospitals seeking a physician initially screen CVs and may interview the candidate in person or by telephone as a first step. The interview usually concentrates on geographical compatibility, medical interests and strengths, personal and recreational issues, and the adequacy of the compensation package. Once the candidate passes this stage, further in-depth interviews are scheduled to ensure that the new physician understands the nature of the practice, culture, and expectations. In the case of a new resident, the examination of medical school records and personal recommendations by supervisors in the completed residency program are usually required by the medical practice.

Once a candidate is identified, it is of critical importance to make sure that the physician can fit into the organization's culture and that the family and spouse are part of the recruitment process. The top two reasons that new physicians leave a medical practice are (1) the physician not fitting in with his or her colleagues and (2) a family member of the physician not being able to adapt (i.e., find acceptable employment, feel comfortable) in the local community. Much time and effort is spent in the recruitment effort to make sure the right candidate is selected to avoid physician turnover.

2000 physician market

The recruitment market for residents/fellowships joining medical groups in 2000 was strong. There were plenty of employers and physicians for most specialties. But the combination of an adequate physician supply of new physicians, limited Medicare reimbursements, and widespread operating cost hikes have resulted in nearly flat pay levels for new physicians in most specialties [21]. New physicians are seeking locations where managed care market penetration is relatively low because of the availability of higher reimbursement. Specialties in high demand include radiology, orthopedic surgery, anesthesiology, gastroenterology, cardiology, obstetrics/gynecology, and hematology/oncology.

The physician recruiting firm, Merritt Hawkins and Associates, reports a dramatic increase for radiologists and anesthesiologists from previous years. In 1997, radiology and anesthesiology were not

considered “hot” placement careers. Today, recruiting these two specialties has become a critical physician-staffing objective for many organizations. The top five recruited specialties in 2000 in rank order were radiology, cardiology, orthopedic surgery, internal medicine, and anesthesiology. This contrasts with the 1997 top five recruited specialties of family practice, internal medicine, obstetrics/gynecology, cardiology, and orthopedic surgery. Other recruited specialties that have seen large increases since 1997 include gastroenterology, general surgery, and urology [22]. Primary care specialists were not in high demand the last couple of years when the gatekeeper managed-care model was rapidly growing.

An examination of the current physician career openings at the Veterans Administration medical facilities reveals that the top three specialty vacancies also do not include primary care but are radiology, gastroenterology, and psychiatry (see table 35). A review of about 185 nonsupervisory physician positions available throughout the 600 facilities in the United States ranks a radiologist as the most sought-after recruit. In fact, 55 percent of the physician vacancies are in six specialty areas [23].

Table 35. VA physician career openings

Specialty	Percentage of career openings
Radiology	14
Gastroenterology	13
Psychiatry	10
Primary care	8
Anesthesiology	5
Cardiology	5

The demand for and supply of radiologists is being driven by several factors. The supply has decreased by early physician retirement and many medical graduates were directed into primary care specialties. Patient aging and the high use of radiology services for patients 65 and older are contributing factors. The diversification in recent years of imaging modalities (CT, MRI, PET, mammography) and their general availability have also increased the demand for radiologists.

Anesthesiology demand has also increased over the last few years. The supply has been subdued while more direct access to specialty services may have increased the number of surgeries being performed. Anesthesiologists remain in short supply because of a sharp drop in enrollment that anesthesiology programs saw several years ago. Enrollment is rising, but a shortage of practitioners remains [22].

Another trend reported by Merritt Hawkins and Associates is a move back toward independent practice settings. With the decline of both hospital-owned practices and large physician practice management firms, physicians are being recruited to more autonomous practice settings, such as solo practices and partnerships. Income guarantees that typically are offered to independent physicians were offered in 33 percent of all searches, up from 23 percent last year (see table 36).

Table 36. Compensation arrangements (percent who receive)

	2000/01	1999/00	1998/99	1997/98
Number of recruits ^a	2,043	1,901	1,807	1,710
Pay structure				
Salary	17%	16%	16%	10%
Salary + bonus	50%	61%	57%	60%
Income guarantees	33%	23%	27%	30%
Gross collections	19%	23%	18%	8%
Net collections	81%	62%	82%	92%
Income loan forgiveness	95%	94%	92%	95%
Signing bonus	29%	24%	34%	29%
Average bonus amount	\$15,176	\$15,900	\$15,400	\$17,000
Relocation allowance	98%	95%	98%	98%
Average allowance amount	\$7,845	\$7,000	\$7,240	\$7,800
Paying Continuing Medical Education (CME)	91%	88%	83%	89%
Average CME	\$2,967	\$2,800	\$2,670	\$2,700
Paying health insurance	96%	96%	85%	89%
Paying malpractice insurance	98%	95%	90%	76%
Paying disability insurance	91%	66%	71%	76%
Paying retirement	66%	67%	71%	67%
Educational loan forgiveness	22%	22%	25%	16%

a. Recruitment assignments surveyed from April 1 to March 31.

Also, more recruitment assignments were received in communities of 100,000 or greater than in the past. Before 1999 and 2000, only 25 percent of searches were for these large communities. These numbers may suggest that the larger communities, which in many cases had an adequate supply or even a surplus of physicians in the past, are finding it difficult to recruit physicians.

Types of incentives offered

The range of incentives detailed in table 36 may be used as one benchmark for evaluating which recruitment incentives are customary and competitive in today's physician employment market [22].

Salary with bonus potential and income guarantees are the preferred methods of payment structure. Of the 33 percent offered guarantees in 2000, 81 percent offered a net collection guarantee, while 19 percent offered a gross collection guarantee. A gross collection guarantee is a guarantee that a physician's pay will be based on a stated minimum number of billings. A net collection guarantee states that the employer will pay the physician based on collecting at least a stated percentage of the physician's billings. Most guarantees are for 1 year with employers. If the new physician does not generate enough revenue (billings) to cover the income guarantee, the physician may owe the practice money. However, 95 percent of the time, these deficits are forgiven.

A typical example of an incentive package containing an income guarantee is a medical practice recruiting a new physician to join the group. The recruitment agreement guarantees the physician a certain monthly or annual income (the "guarantee income"). The practice group receives reimbursements in connection with the services provided by the new physician. These payments, less any refunds, will equal the physician's net collections. Depending on the recruitment agreement, the parties will subtract from the gross or net collections the expenses associated with the physician's practice to arrive at the physician's net receipts. Over the term of the agreement (usually 1 year), a reconciliation will take place between the physician's net receipts and income guarantee. If the physician's net receipts are less than the guarantee income, the physician owes the practice the

difference. However, nearly all these "loans" are forgiven if the physician remains with the practice at least 2 to 3 years. Thus, loan forgiveness is also a retention tool. According to Merritt Hawkins and Associates, loan forgiveness of guarantees is over 95 percent. However, the Medical Group Management Association reports that 89 percent of its member practices did not offer loan forgiveness in 1999 [24].

It is not unusual for hospitals to partner with a medical practice when recruiting physicians. Typically, a nonprofit hospital will identify a specialty, such as general surgery, in which the immediate geographic area is underserved. The hospital may partner with a practice group that already furnishes surgeons to the hospital and assist the group with recruiting another surgeon. The incentive package will contain an income guarantee (as stated above) except the hospital will extend a line of credit to the practice group. The group may draw against this line of credit on a monthly basis to cover the differences, if any, by which the guarantee income exceeds the physician's net receipts. As long as the terms of the recruitment agreement are met, the practice group will be allowed to defer paying monthly installments on the loan balance during the initial period of the physician's employment (e.g., 12 to 24 months). After the initial employment period is met and the physician and practice group continue to meet their obligation, the hospital will begin to forgive portions of the loan balance on an incremental basis until the balance is entirely forgiven.

The hospital will likely require the practice group to carry a life insurance policy on the physician's life throughout the term of the recruitment agreement as security for the loan balance. The insurance policy will name the hospital as the beneficiary, entitling it to be paid only to the extent necessary to repay the loan balance in the event of the physician's death. The hospital may also pay for reasonable moving expenses and possibly offer the physician to earn additional income as a medical advisor for the hospital. If for any reason the hospital or medical practice terminates the recruitment agreement for cause, the unpaid balance will become immediately due and the practice group will not be entitled to further loan forgiveness or deferral [25].

Additional incentives may be available, depending on local market conditions, to recruit new or established physicians. In northern

California, the key to finding new hires is finding a way to pay off high medical school debt. New doctors who come out of school with debts approaching \$100,000 want good pay up front to reduce debt. Given that, the toughest competition comes from the Midwest, where physicians can develop a practice faster, buy a house, and pay off debts sooner.

For example, Kaiser Permanente in northern California has no shortage of physicians in the San Francisco area but has trouble recruiting physicians in Silicon Valley. Ninety-five percent of physicians surveyed in the area have problems recruiting physicians to the valley. The main barrier to recruiting new physicians is the median price of homes in the area, which are in excess of \$500,000. Kaiser Permanente subsidizes recruits up to 10 percent of the purchase price of a home to a maximum of \$100,000. The loan is forgiven if the physician stays with Kaiser for more than 10 years [26]. This program helps recruit physicians who want to be in the area. Kaiser Permanente and other medical groups in the area actively recruit physicians who choose the valley to start their careers because of personal ties in the local community or because they are married to high-tech workers.

In select areas, such as Boston, where there is high managed-care penetration and a high cost of living, medical practices are offering excellent fringe benefits, including parking spaces, free tuition for children, car leases, and signing bonuses. However, the Massachusetts General Physician Organization and Harvard University cannot afford these perks; therefore, the key recruitment strategy for these organizations is the Harvard connection [27].

The use of direct incentives by medical practices and hospitals to recruit additional physicians to provide services is closely regulated by government statutes and enforcement practices. Federal statutes prohibit hospitals from billing Medicare or Medicaid for services to patients referred by physicians with any "compensation arrangement" with the hospital unless the arrangement is covered by a specific exception. The term "compensation arrangement" is broadly defined to include any form of remuneration, whether direct or indirect, in cash or in kind. For instance, federal regulations prohibit—under

any circumstance—providing office space at below-market rentals, providing free physician practice management services or other incentives to physicians who do not geographically locate. If violated, hospitals can incur substantial penalties.

Recruitment strategies in rural communities

With declining income, high medical student debt, and lack of support services to physicians and their families in rural and small towns, recruiting and retaining physicians for rural service is becoming more difficult. While 20 percent of the nation's 285 million people reside in rural areas, only 9 percent of physicians practice there [28].

Rural community recruitment has its own unique challenges. The dominant practice is family practice in rural America. Few specialists are based in rural communities. The population required to support specialists as well as the technological capabilities required limit them to urban communities that have advanced secondary or tertiary facilities. The key reasons physician do not practice in rural areas are the lack of financial resources, outdated equipment, and long hours. Physician recruitment is an arduous process; it may take up to 3 years to find, select, and contract with a physician.

Communities usually court physicians from family medicine residency programs. Successful recruiting has occurred among residents who were raised in a rural area. Place of birth appears to be the best predictor of whether a medical student chooses to practice in a rural area or a small town. But a consistent mentoring program during medical school and family practice preceptorships are also key factors [29]. Many communities embark on "grow your own" physician programs by identifying local community high school students and offering them scholarships for college and medical school so they will return to the community to practice primary care medicine.

Federal, state, community, and private resources are available to help rural designated communities attract and retain primary care physicians in rural and medically underserved communities. Typical recruitment strategies are loan repayment and salary guarantees. Loan

repayment is the most popular incentive. Many foundations, such as Colorado Rural Outreach Program, will fund \$10,000 each year for a maximum of 3 years on the condition that the community matches \$10,000 for each year up to 3 years. The physician may receive \$20,000 additional income at the end of each year. Communities may offer 1-year salary guarantee contracts for new physicians in an effort to give time to grow a practice, and some states also provide retention grants to help keep physicians in the community [30].

Physician employment demographics

The majority of physicians (62 percent) are self-employed in a solo or group practice or as an independent contractor. Physicians who are employed with a health maintenance organization (HMO), group practice or freestanding centers, private hospitals, or academic or government service constitute the remaining 38 percent. About half of internal medicine and pediatric physicians tend to work as employees of an organization (see table 37) [31].

Table 37. Percentage of physicians by employment type (1999)

Specialty	Solo self-employed	Group self-employed	Employee	Independent contractor
All physicians	25.5	33.2	38.2	2.9
Gen./fam. practice	28.5	28.4	39.4	3.4
Internal medicine	23.1	26.1	48.8	1.7
Cardiovascular	22.6	49.2	25.6	2.7
Gastroenterology	23.2	54.9	21.9	0.0
General surgery	34.9	39.6	24.0	1.6
Orthopedic surgery	28.3	49.6	20.7	0.8
Urology	27.1	48.4	23.1	1.4
Pediatrics	19.8	27.5	50.5	2.1
OB/GYN	33.9	34.2	31.3	0.6
Radiology	3.7	54.8	38.2	3.2
Psychiatry	44.7	9.7	42.6	3.0
Anesthesiology	9.2	40.7	42.2	6.9

Table 38 details the distribution of employee physicians by employer. As expected in HMOs, the primary care specialties of general and family practice, internal medicine, and pediatrics represent a high penetration (24 percent) among total physicians, whereas anesthesiology has the highest non-primary-care penetration [31].

Table 38. Percentage of distribution of employee physicians by employer (1999)

Specialty	Health maintenance organizations	Group practices or freestanding centers	Private hospitals	Med. schools, universities, or colleges	State/local government and others
All physicians	6.8	26.2	20.1	20.3	23.4
Gen./fam. practice	7.2	26.6	25.7	11.0	26.9
Internal medicine	8.3	22.2	24.1	18.4	23.5
Cardiovascular	0.0	22.2	20.4	26.8	24.6
Gastroenterology	N/A	N/A	N/A	N/A	N/A
General surgery	6.8	29.7	12.3	29.3	18.5
Orthopedic surg	4.9	32.1	7.7	35.3	12.3
Urology	6.8	22.7	5.0	52.2	5.1
Pediatrics	8.1	18.6	24.2	20.3	26.0
OB/GYN	2.1	25.7	22.7	14.4	28.4
Radiology	6.0	45.4	10.6	28.8	6.9
Psychiatry	3.2	2.9	18.9	12.6	61.4
Anesthesiology	10.0	46.6	6.5	25.8	8.5

Physician retention

With demand increasing nationwide, medical practices and hospitals need to pay attention to keeping their most valued physicians on board. Physicians leave a practice because they feel they cannot fit into its culture or the local community. Unfortunately, few groups approach physician retention with the same intensity that they put into recruiting. As mentioned earlier, loan forgiveness may be a short-term retention strategy for some medical practices. Strong retention plans save a great deal of money and reduce stress on the practices' other physicians and staff. Yet, few practices have any formal plans.

This lack of formal plans may be caused by the low turnover rate experienced by medical groups. In 1999, the Medical Group Management

Association surveyed its membership on whether the groups formally track physicians leaving their practice and, if they do, why physicians left the practice. Of the 224 groups (3,298 providers) responding, 137 groups did formally track terminating physicians, and 87 did not. Of the groups that did track terminations, 10 percent of physicians left medical practice in 1999. The most common reasons for physicians to depart were retirement and moving from the community [32].

A physician may leave a practice for unavoidable reasons, such as changes in the needs of the physician or a family member, retirement, disability, or death. Avoidable losses are those that could have been corrected by the medical group or prevented in the first place through more careful recruiting. Avoidable issues include the following:

- Professional—the departing physician did not get along or bond with colleagues
- Spouse—a family member could not adapt to the community
- Feedback—the physician could not make meaningful feedback into the work environment
- Compensation—the physician felt that the income outlook was not good or likely to improve over time
- Quality—the physician felt the facility, equipment, or personnel impeded the practice of quality medicine
- Challenge—the physician found daily activities were too easy and feared erosion of medical skills [33].

Another measure of physician turnover is reported by the Health Plan Employer Data and Information Set (HEDIS). HEDIS requires health plans to measure physician turnover. This measure indicates the percentage of primary care and non-primary-care practitioners who leave the plan. A low turnover rate suggests that a practitioner is more likely to stay with the health plan allowing health plan members to form a stable relationship with their practitioners. Kaiser Permanente's national turnover rate reported in its 2000 HEDIS survey was 10 percent for primary care practitioners and 12 percent for non-primary-care practitioners [34].²¹

21. In comparison, continuation rates of specialists in the military ranged from 15 to 17 percent between FY 1991 and FY 1998 [3].

To gain insight on new physician workforce patterns, the AMA collects data from physicians who have been practicing for 2 years. The latest available survey period was in 1999. This physician workforce survey asks physicians about their current employment, work environment, and the impact of market forces on their clinical practice. Table 39 details (by selected specialties) salary expectations, satisfaction with current practice arrangement, the likelihood of job change, the number of job offers received, the difficulty in securing a preferred position, and the number of positions held since completing graduate medical education 2 years ago [35].

Table 39. Workforce experience: physicians with 2 years of medical practice

	Specialty ^a							
	AN	CD	FP	GI	IM	OS	PD	RA
Current salary equal or higher than expected	56.7%	56.7%	65.7%	50.5%	53.0%	56.2%	59.5%	68.8%
Overall satisfaction with current practice arrangement ^b	3.7	3.7	3.6	3.8	3.4	3.7	3.7	3.8
Likelihood of changing jobs in the next 2 years ^c	2.6	2.2	2.7	2.3	2.9	2.1	2.6	2.3
Avg. number of jobs received	3.5	4.8	6.8	4.2	4.0	5.1	3.3	3.6
Experienced difficulty securing a preferred position	18.5%	15.2%	11.8%	24.5%	29.3%	7.7%	20.8%	21.7%
Avg. number of positions held since completing GME (incl. current position)	1.4	1.1	1.3	1.2	1.3	1.1	1.3	1.2

a. AN = anesthesiology; CD = cardiology; FP= family practice; GI= gastroenterology; IM = internal medicine;

OS = orthopedic surgery; PD = pediatrics; RA = radiology (diagnostic).

b. 1 = very unsatisfied, 5 = very satisfied.

c. 1 = very unlikely, 5 very likely.

Of the selected specialties reviewed, 69 percent of radiologists responded that their current salary was equal to or higher than expected, whereas only 50 percent of gastroenterologists gave similar

responses. The specialties of gastroenterology and radiology responded in greater numbers that they were satisfied with their current practice arrangement; fewer internal medicine physicians responded they were satisfied. The likelihood of physicians changing jobs in the next 2 years was lower for orthopedic surgeons and cardiologists and higher for internal medicine and family practitioners. In 1999, internal medicine physicians had a more difficult time securing their preferred positions, while orthopedic surgeons had the least trouble. Most responding physicians are still at the first position they accepted out of residency.

Findings

Following our review of the literature regarding physician residency hours and compensation, physician recruitment and physician retention strategies, and current physician market conditions, we present the following conclusions:

- Compensation in residency programs is fairly standard across the country. Most programs set residency stipends by the number of completed graduated years regardless of specialty. In addition to cash compensation, residents are considered employees of the hospital or medical institutions and generally enjoy the same benefits afforded by other employees. However, programs having difficulty attracting residents, such as those located in high-cost-of-living areas or in communities with limited amenities, may offer higher compensation. This might include additional base pay, repayment of student loans, and additional employment opportunities (e.g., moonlighting) during their residency. On the other hand, residency hours vary widely depending on specialty, hospital, and even hospital department.
- The compensation for uniformed residents and fellows exceeds that of their civilian counterparts for every specialty.
- Recruitment of a new physician usually takes 9 to 12 months in urban areas and up to 3 years or more in rural areas. Medical offices tend to invest substantial resources in recruiting a physician as well as the physician's spouse or family.

- Most practitioners recruit locally where physicians were residents or teaching hospitals near their offices. In turn, it is not unusual for residents to locate their new practice close to where they completed their residency program.
- The top five recruited specialties in 2000, listed in rank order, were radiology, cardiology, orthopedic surgery, internal medicine, and anesthesiology. This differs from 3 years ago when the top five were family practice, internal medicine, obstetrics/gynecology, cardiology, and orthopedic surgery.
- Salary with bonus potential and guarantees are the preferred methods of structuring a physician's income. Additional incentives may include relocation allowances, paying for continuing medical education fees, health insurance, malpractice insurance, and disability insurance. Such incentives as educational loan forgiveness and signing bonuses occur less often.
- Physician turnover is about 10 percent for medical groups. Medical groups tend to approach physician retention with much less intensity than they put into recruitment. Retirement is number one, and the next two most common reasons for a physician to leave a practice are not getting along with colleagues or a family member not adapting to the local community.

Conclusions

Personnel planning is an important business process and critical to the Navy, and DoD as a whole, in meeting its workforce objectives. Personnel plans and policies affect the manning, retention, and overall "health" of various communities.

The MED-52 BUMIS personnel database is a powerful tool and is critical to Navy Medicine's personnel planning business process. The Navy needs to continue to strengthen its personnel planning process by improving the quality of its BUMIS data and tracking the retention of its specialists at critical stay-leave military decision points. Moreover, the long-term impact of reducing residency and fellowship opportunities for some specialties must be assessed because manning difficulties may not, by default, be a retention problem but rather an insufficient number of physicians being accessed into the training pipeline.

In conducting this analysis, we did not investigate the question of whether the Navy's retention rate is "good" or "bad." We strongly recommend that a study be conducted to determine "expected" retention rates, by specialty. This study would include an in-depth analysis of specialty attrition rates and a rigorous assessment of the total life-cycle cost of physician accessions to determine the most effective and economical means for the Navy to fill its specialty billets. Moreover, this study would weigh the cost of accessions with the cost of increasing retention by paying higher wages. It would also weigh the cost and benefits of filling billets with physicians from various accession sources or a mix of accession sources. This type of analysis would also benefit other medical department officer communities.

Appendix A: Specialty overview trends

Variable definitions

Duty Physicians denote the number of board-eligible, active duty specialists, excluding physicians serving in executive medicine and training positions. Although Navy physicians may specialize in more than one area, for purposes of this analysis, they are only considered to be specialists in the area designated by their primary subspecialty code (subsp1).

Percent of All Duty Specialists indicates the number of duty physicians in a particular specialty divided by the total number of duty specialists in the Navy.

Average Age denotes the average age of duty specialists. Age is determined by taking the difference between October 1 of each FY and the date of birth (dob) field for each specialist.

Male Physicians indicates the number of male duty physicians in a particular specialty, as determined by their gender field (gender), divided by the total number of duty physicians in that specialty.

Ethnicity indicates the percentage of duty specialists that are Caucasian, Black, Asian, and Other race or ethnicity, as determined by the race field (race). Because of the large percentage of unknowns for this variable, the actual percentage of minorities in the Navy may be understated.

Marital Status indicates the number of duty specialists Married, Married to Active Duty individuals, and Single. This information is derived from the officer master file, based on the "pdep" variable, which also contains the number of dependents for each specialist.

Average Number of Dependents indicates the average number of dependents for Married, Married to Active Duty, and Single duty specialists. This information is derived from the officer master file, based on the "pdep" variable, which also contains the marital status for each specialist.

Average YOCS indicates the average number of years of commissioned service for duty specialists. YOCS is determined by taking the difference between October 1 of each FY and each specialist's active commissioned based date code (acbd).

Average YOS indicates the average number of years of actual service for duty specialists. YOS is determined by taking the difference between October 1 of each FY and each specialist's active duty based date code (adbd).

Paygrade indicates the percentage of O-3, O-4, O-5, and O-6 duty specialists, as determined by each specialist's paygrade code (grade). All flag officers are excluded.

Percent Board Certified indicates the percentage of duty physicians in a particular specialty board certified in that specialty. Board certification is designated by the character K in the last position of each specialist's primary subspecialty code (subsp1). This variable does not illustrate the fact that certain specialists may be board certified in more than one specialty.

Average Years of Practice (YOP) in Specialty indicates the average years of practice duty specialists possess in that particular specialty, based upon completion of the training program. The YOP in specialty is determined by computing the average difference between October 1 of each FY and each specialist's initial residency completion (IRC) field. For internal medicine and general surgery subspecialties the YOP is based upon the second residency completion (SRC) field.

Residents in Training indicates the number of residents in training for a particular specialty, as determined by each specialist's primary subspecialty code (subsp1), "cnobc", and "aqd1".

Fellows indicates the number of fellows in a particular specialty, as determined by each specialist's primary subspecialty code (subsp1), "cnobc", and "aqd1".

Summary of all Navy duty specialists

	FY87	FY88	FY89	FY90	FY91	FY92	FY93	FY94	FY95	FY96	FY97	FY98	FY99	FY00
Duty physicians	1655	1682	1775	1841	1966	1967	2059	2023	1969	1979	2011	2059	2104	2134
Average age (years)	37.7	38.1	38.7	39.0	39.3	39.6	39.6	39.9	40.2	40.5	40.4	40.3	40.2	40.2
Male physicians	88%	88%	88%	89%	90%	90%	90%	89%	87%	85%	84%	83%	81%	79%
Ethnicity														
White	71%	78%	84%	83%	80%	80%	82%	84%	90%	89%	88%	85%	82%	81%
Black	2%	2%	2%	2%	2%	2%	2%	2%	3%	3%	3%	3%	3%	3%
Asian	2%	2%	2%	2%	2%	2%	2%	2%	3%	3%	3%	3%	4%	4%
Other	3%	4%	3%	3%	3%	3%	3%	3%	3%	2%	2%	2%	2%	2%
Unknown	22%	15%	9%	9%	13%	12%	11%	9%	2%	2%	4%	7%	9%	10%
Marital status														
Married	77%	77%	77%	77%	79%	78%	79%	79%	77%	76%	75%	73%	70%	68%
Married to AD	6%	6%	6%	6%	6%	6%	6%	6%	7%	8%	8%	8%	9%	9%
Single	16%	16%	16%	16%	15%	15%	14%	14%	16%	16%	16%	16%	16%	16%
Unknown	1%	1%	1%	1%	0%	0%	0%	1%	0%	0%	0%	2%	5%	21%
Average no. of dependents														
If married	2	2	2	2	2	2	2	2	2	2	2	2	2	2
If married to AD	1	1	1	1	1	1	1	1	1	1	1	1	1	1
If single	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Average YOCS	8.8	8.8	8.8	8.6	9.0	9.2	9.5	9.9	10.3	10.7	10.8	10.8	10.9	11.0
Average YOS	9.0	9.1	9.0	8.9	9.2	9.5	9.8	10.2	10.6	11.0	11.1	11.1	11.2	11.3
Paygrade														
Percent O-3	17%	18%	18%	18%	18%	18%	17%	18%	19%	19%	18%	18%	17%	17%
Percent O-4	25%	26%	25%	25%	25%	26%	26%	28%	28%	30%	31%	33%	30%	28%
Percent O-5	43%	43%	47%	47%	47%	46%	46%	45%	41%	38%	36%	34%	38%	39%
Percent O-6	15%	13%	10%	10%	10%	10%	12%	10%	12%	13%	15%	16%	15%	16%
Percent board certified	54%	54%	56%	56%	54%	55%	56%	56%	55%	56%	57%	58%	55%	57%
Average YOP in Specialty	5.5	5.7	6.1	6.2	6.4	6.5	6.2	6.4	6.6	6.7	6.6	6.4	6.2	6.2
Residents in training	713	733	802	858	808	807	724	706	710	658	599	578	615	555
Fellows	87	101	111	152	150	135	130	130	123	121	133	117	105	106
Trends														

Population:

Over the last decade the number of Navy, fully trained (duty) specialists increased by about 29 percent, from 1655 in FY 1987 to 2134 in FY 2000. The civilian sector also experienced a rise in specialists over the last decade, from 484,531 in FY 1988 to 639,181 in FY 1999--an approximate 32 percent increase.

Age & Gender:

The average age of Navy specialists increased slightly, from 37.7 years in FY 1987 to 40.2 years in FY 2000. Civilian specialists also appear to have gotten older over the last decade. Between 1989 and 1999, the percentage of civilian specialists under age 35 decreased from about 26 to 17 percent and the

percentage of those age 35 to 44 decreased from 33 to 29 percent. During the same time period, the percentage of civilian specialists age 45 to 54, 55 to 64, and over age 65 all increased. The largest percentage increase was among civilian specialists age 45 to 54, which rose from 20 to 28 percent between 1989 and 1999. The most common age group for civilian specialists throughout the decade was age 35 to 44. The percentage of female specialists in the Navy increased from 12 to 21 percent between FY 1987 and FY 2000. The civilian sector also witnessed an increased in female specialists, from about 15 percent in 1988 to 24 percent in 1999.

Ethnicity:

The Navy experienced a slight increase in minority specialists throughout the decade, from 7 percent in FY 1987 to 9 percent in FY 2000. The percentage of Black Navy specialists rose from 2 to 3 percent during this time, whereas the percentage of Navy specialists categorized as other race or ethnicity fell from 3 to 2 percent. The percentage of Asian Navy specialists rose from 2 percent in FY 1987 to 4 percent in FY 2000.

Marital Status & Dependents:

The percentage of married Navy specialists (not married to active duty (AD) individuals) decreased from 77 percent in FY 1987 to 68 percent in FY 2000, whereas the percentage of those married to AD increased from 6 to 9 percent during this time. The percentage of single Navy specialists changed little over the decade, remaining at 16 percent in both FY 1987 and FY 2000. The average number of dependents throughout the decade was 2 for married Navy specialists (not married to AD), 1 for those married to AD, and 0 for single Navy specialists.

Years of Commissioned Service (YOCS), Years of Service (YOS) & Paygrade:

The average YOCS for Navy specialists increased from 8.8 years in FY 1987 to 11.0 years in FY 2000, whereas the average YOS increased from 9.0 to 11.3 years during this time. The composition of Navy specialists by paygrade varied only slightly over the last decade. From FY 1987 to FY 2000, O-3s ranged from 17 to 19 percent of Navy specialists and O-6s ranged from 10 to 16 percent. The percentage of O-4s increased from 25 percent in FY 1987 to 28 percent in FY 2000, whereas the percentage of O-5s decreased from 43 to 39 percent.

Board Certification, Experience & Training:

The percentage of board certified Navy specialists increased from 54 to 57 percent between FY 1987 and FY 2000. The percentage of board certified civilian specialists also rose, from about 63 to 72 percent between 1989 and 1999. The average years of practice (YOP) in specialty for duty Navy specialists increased from 5.7 to 6.6 years between FY 1987 and FY 2000. These values do not include the YOP for internal medicine and general surgery subspecialties. The number of Navy residents in training for all specialties fell from 713 in FY 1987 to 555 in FY 2000—an approximate 22 percent decrease. The percentage of Navy specialty fellows, however, increased from 87 in FY 1987 to 107 in FY 2000—an approximate 23 percent increase.

* FY 2000 marital status and dependents data for singles have been excluded because 21 percent of the data are missing and the values are inconsistent with those of previous years.

Aerospace medicine

	FY87	FY88	FY89	FY90	FY91	FY92	FY93	FY94	FY95	FY96	FY97	FY98	FY99	FY00
Duty physicians	23	23	25	26	32	32	34	37	40	42	41	46	53	65
Percent of all duty specialists	1%	1%	1%	1%	2%	2%	2%	2%	2%	2%	2%	2%	3%	3%
Average age (years)	48.4	48.0	47.6	45.8	46.1	45.5	45.9	46.1	47.1	47.7	47.7	46.7	46.6	45.9
Male physicians	96%	96%	100%	100%	100%	97%	97%	97%	98%	95%	95%	93%	96%	97%
Ethnicity														
White	100%	100%	100%	96%	91%	91%	88%	89%	95%	95%	93%	93%	89%	92%
Black	0%	0%	0%	0%	3%	3%	3%	3%	3%	2%	5%	2%	2%	2%
Asian	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	2%	2%
Other	0%	0%	0%	4%	3%	3%	3%	3%	3%	2%	2%	2%	4%	3%
Unknown	0%	0%	0%	0%	3%	3%	6%	5%	0%	0%	0%	2%	4%	2%
Marital status														
Married	87%	83%	92%	88%	84%	88%	79%	78%	75%	79%	83%	78%	75%	72%
Married to AD	4%	9%	8%	8%	6%	6%	6%	5%	5%	5%	2%	2%	4%	5%
Single	9%	9%	0%	4%	9%	6%	15%	16%	20%	17%	15%	17%	21%	*
Unknown	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	2%	0%	20%
Average no. of dependents														
If married	2	2	2	2	2	2	2	2	2	2	2	2	2	2
If married to AD	2	3	2	3	3	3	3	3	2	2	0	0	2	2
If single	2	2		0	0	0	1	1	1	1	1	0	0	*
Average YOCs	15.8	15.0	15.0	13.5	13.8	13.4	13.8	14.0	14.8	15.0	14.8	14.4	14.1	13.9
Average YOS	16.6	15.8	15.7	14.1	14.2	13.6	14.4	14.5	15.4	15.4	15.1	14.7	14.4	14.4
Paygrade														
Percent O-3	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	2%	6%	11%
Percent O-4	0%	0%	4%	8%	6%	6%	12%	14%	5%	5%	5%	7%	6%	14%
Percent O-5	22%	26%	32%	42%	44%	47%	41%	30%	33%	36%	39%	39%	42%	35%
Percent O-6	78%	74%	64%	50%	50%	47%	47%	57%	63%	60%	56%	52%	47%	40%
Percent board certified	61%	65%	60%	50%	38%	41%	68%	65%	63%	52%	46%	41%	45%	45%
Average YOP in Specialty	9.6	8.3	7.9	5.9	6.5	6.1	6.2	6.5	6.7	8.3	9.0	9.2	9.1	8.4
Residents in training	13	16	14	16	16	15	12	13	15	13	17	26	43	16
Fellows	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Trends														

Population:

Over the past decade, the number of Navy, fully trained (duty) physicians specializing in aerospace medicine (AM) nearly tripled, from 23 specialists in FY 1987 to 65 in FY 2000. The number of civilian sector AM physicians, however, decreased, from 685 in 1988 to 484 in 1999.

Percent of All Duty Specialists:

From FY 1987 to FY 2000, the percentage of AM physicians increased from 1 to 3 percent of all active duty Navy specialists.

Age & Gender:

Within the Navy, the average age of AM physicians from FY 1987 to FY 2000 was about 47 years. Unlike Navy AM physicians, the age of civilian AM physicians seems to be increasing. From FY 1989 through FY 1997, the most common civilian age group was 35 to 44 years, compared to 45 to 54 years in 1998 and 1999. From 1989 to 1997, the percentage of AM physicians in the civilian sector age 65 and over increased from about 7 to 22 percent. Over the same time period, the percentage of civilian AM physicians under age 35 fell from about 25 to 2 percent. The percentage of female AM physicians in the Navy decreased slightly over the past several years, from about 4 percent in FY 1987 to 3 percent in FY 2000, whereas it increased in the civilian sector, from about 5 percent in 1988 to 6 percent in 1999.

Ethnicity:

Navy aerospace medicine had no minority physicians in FY 1987, FY 1988, and FY 1989. By FY 2000, however, the racial/ethnic mix was 92 percent Caucasian, 2 percent black, 2 percent Asian, and 3 percent other. There were no Asian duty AM physicians until FY 1999.

Marital Status & Dependents:

The percentage of married AM physicians (not married to active duty (AD) individuals) decreased from about 87 percent in FY 1987 to 72 percent in FY 2000. During this same time period, the average number of AM physicians married to AD individuals ranged from about 2 to 9 percent. Furthermore, the percentage of single AM physicians in the Navy increased, from about 9 percent in FY 1987 to 22 percent by FY 1999. The average number of dependents for married AM physicians (not to AD) was 2 from FY 1987 to FY 2000. During this same time period, the average number of dependents fluctuated between 0 and 3 for those married to AD, and from 0 to 2 for those who were single.

Years of Commissioned Service (YOCs), Years of Service (YOS) & Paygrade:

The average YOCs fell from 15.8 years in FY 1987 to 13.9 years by FY 2000. The average YOS for Navy AM physicians followed a similar pattern over the past decade, with an overall decrease from 16.6 years in FY 1987 to 14.4 years in FY 2000. In FY 1987 and FY 1988, Navy AM was composed entirely of duty physicians who were either O-5s or O-6s. Although they continue to account for most of the specialty, in FY 2000 O-3s accounted for about 11 percent and O-4s 14 percent of Navy AM physicians. The Navy had no O-3 AM physicians until FY 1998, and no O-4s until FY 1989. The percentage of O-4s has fluctuated greatly since this time, with an overall 10-percent-point increase from FY 1989 to FY 2000. The percentage of O-5s increased over the decade as well, from about 22 percent in FY 1987 to 35 percent in FY 2000, whereas the percentage of O-6s fell from about 78 to 40 percent during the same time period.

Board Certification, Experience & Training:

The percentage of board-certified Navy AM physicians fell from 65 percent in FY 1988 to 45 percent in FY 2000. In the civilian sector, however, there was a noticeable increase in the percentage that were board certified—48 percent in 1989, compared to 69 percent in 1999. Over the past decade, the average years of practice (YOP) in specialty for duty Navy AMs fluctuated between 6 and 9 years. During this same time, the number AM residents varied greatly, ranging from 12 residents in FY 1993 to 43 residents in FY 1999.

* FY 2000 marital status and dependents data for singles have been excluded because 20 percent of the data are missing and the values are inconsistent with those of previous years.

Anesthesiology

	FY87	FY88	FY89	FY90	FY91	FY92	FY93	FY94	FY95	FY96	FY97	FY98	FY99	FY00
Duty physicians	112	119	138	138	156	173	181	165	140	137	145	137	141	122
Percent of all duty specialists	7%	7%	8%	7%	8%	9%	9%	8%	7%	7%	7%	7%	7%	6%
Average age (years)	35.2	35.8	36.7	36.6	37.4	37.2	37.8	38.6	39.4	39.2	39.2	39.5	38.9	39.0
Male physicians	90%	96%	100%	100%	100%	97%	97%	97%	98%	95%	95%	93%	96%	97%
Ethnicity														
White	61%	73%	81%	82%	72%	72%	77%	81%	90%	87%	81%	79%	78%	83%
Black	0%	0%	1%	1%	1%	2%	2%	2%	1%	1%	1%	2%	2%	2%
Asian	3%	3%	3%	2%	3%	2%	2%	2%	1%	4%	6%	7%	5%	3%
Other	2%	2%	1%	2%	1%	2%	1%	2%	2%	1%	0%	1%	1%	2%
Unknown	35%	23%	14%	13%	24%	22%	18%	14%	5%	6%	11%	12%	13%	9%
Marital status														
Married	72%	72%	76%	76%	81%	82%	82%	84%	80%	80%	71%	69%	66%	68%
Married to AD	11%	10%	5%	6%	5%	4%	4%	2%	4%	6%	9%	9%	9%	10%
Single	16%	17%	19%	17%	14%	14%	14%	14%	16%	14%	19%	19%	18%	*
Unknown	1%	1%	0%	1%	0%	0%	1%	0%	0%	1%	1%	4%	6%	20%
Average no. of dependents														
If married	1	2	1	2	2	2	2	2	2	2	2	2	2	2
If married to AD	1	1	1	1	1	2	1	2	2	2	1	1	1	1
If single	0	0	0	0	0	0	0	0	0	0	0	0	0	*
Average YOCs	6.7	6.7	6.8	6.4	6.7	7.1	7.8	8.8	9.6	9.8	9.8	10.2	10.2	9.9
Average YOS	7.1	7.1	7.2	6.9	7.1	7.5	8.2	9.1	10.0	10.2	10.2	10.7	10.7	10.4
Paygrade														
Percent O-3	29%	21%	20%	22%	21%	25%	17%	7%	9%	9%	13%	12%	13%	16%
Percent O-4	54%	55%	55%	55%	54%	47%	55%	62%	54%	54%	52%	47%	50%	50%
Percent O-5	10%	17%	19%	20%	19%	21%	19%	19%	26%	26%	26%	31%	27%	25%
Percent O-6	7%	8%	7%	3%	6%	7%	9%	12%	11%	10%	10%	11%	9%	10%
Percent board certified	38%	48%	56%	55%	49%	55%	57%	64%	66%	66%	59%	67%	62%	62%
Average YOP in Specialty	3.5	3.6	4.1	3.8	4.5	4.4	4.7	5.1	5.3	5.1	4.8	5.1	4.8	5.0
Residents in training	65	74	78	83	76	70	65	66	56	51	44	42	42	35
Fellows	0	0	0	0	0	0	0	0	1	3	5	4	2	3

Trends

Population:

The number of fully trained (duty) anesthesiologists (ANs) increased steadily from 112 specialists in FY 1987 to 181 in FY 1993, and decreased to only 122 specialists by FY 2000. The civilian sector, on the other hand, witnessed a steady increase in the number of ANs over the past decade, from 24,258 specialists in 1988 to 34,747 in 1999—an approximate 43-percent increase in 10 years.

Percent of All Duty Specialists:

From FY 1987 to FY 2000, the percentage of ANs ranged from 6 to 9 percent of all active duty Navy specialists.

Age & Gender:

The average age of Navy ANs increased from 35.2 years in FY 1987 to 39 years in FY 2000. The average age for Navy ANs across this time period is 37.9 years. The most common age group for civilian ANs was 35 to 44 years from 1989 to 1999, accounting for about 32 percent of civilian ANs in 1989 and up to 39 percent by 1999. Most of the increase in civilian ANs age 35 to 44 came from a subsequent decrease in the percentage of those age 35 and younger, which fell from 28 percent to 12 percent over the same time period. The percentage of female ANs in the Navy decreased in the past several years, from 10 percent in FY 1987 to only 3 percent in FY 2000. In FY 1989, FY 1990, and FY 1991, there were no female duty ANs. The percentage of female ANs in the civilian sector, on the other hand, rose steadily from about 17 percent in 1988 to 20 percent in 1999.

Ethnicity:

The percentage of minority ANs in the Navy increased to some extent, from 7 percent in FY 1987 to about 8 percent in FY 2000, with the percentage of black and other ANs each ranging from 0 to 3 percent over this time period. The percentage of Asian duty ANs reached a high of 7 percent in FY 1998, yet declined to 4 percent by FY 2000.

Marital Status & Dependents:

The percentage of married Navy ANs (not married to active duty (AD) individuals) increased from about 72 to 80 percent between FY 1987 and FY 1996, and subsequently decreased to 68 percent by FY 2000. The percentage of those married to AD, however, decreased in the early part of the decade from 11 to 2 percent, and later increased to about 10 percent by FY 2000. The percentage of single Navy ANs ranged from 14 to 19 percent throughout most of the decade. From FY 1987 to FY 2000, the average number of dependents was 2 for married ANs (not to AD), 1 for those married to AD, and 0 for single ANs.

Years of Commissioned Service (YOCs), Years of Service (YOS) & Paygrade:

The average YOCs increased from 6.7 years in FY 1987 to 9.9 years in FY 2000. The average YOS also rose during the same time period from 7.1 to 10.4 years. Nearly half of Navy ANs were O-4s from FY 1987 to FY 2000. The percentage of O-3s decreased during this time from about 29 to 16 percent, reaching a low of about 7 percent in FY 1994. The percentage of O-5s increased from about 10 to 25 percent from FY 1987 to FY 2000, whereas the percentage of O-6s rose only slightly, from about 7 to 10 percent during this time.

Board Certification, Experience & Training:

The percentage of board-certified AN physicians in both the Navy and civilian sector has risen. Those in the Navy increased from about 38 percent in FY 1987 to 62 percent in FY 2000, whereas those in the civilian sector rose from about 51 percent in 1989 to 70 percent in 1999. The average years of practice (YOP) in specialty for duty Navy ANs also increased somewhat over the past decade, from 3.5 years in FY 1987 to 5.0 years in FY 2000. During this same time period, the number of AN residents decreased from 65 to 35 residents, despite a temporary rise from FY 1987 to FY 1991. The average number of AN fellows from FY 1995 to FY 2000 was 3.

* FY 2000 marital status and dependents data for singles have been excluded because 20 percent of the data are missing and the values are inconsistent with those of previous years.

Dermatology

	FY87	FY88	FY89	FY90	FY91	FY92	FY93	FY94	FY95	FY96	FY97	FY98	FY99	FY00
Duty physicians	39	38	36	38	36	50	55	58	44	43	44	45	42	42
Percent of all duty specialists	2%	2%	2%	2%	2%	3%	3%	3%	2%	2%	2%	2%	2%	2%
Average age (years)	39.0	40.7	40.5	41.5	41.5	40.2	39.8	40.3	40.6	40.4	40.6	41.7	42.5	42.4
Male physicians	90%	89%	86%	82%	78%	78%	82%	81%	80%	79%	82%	82%	81%	79%
Ethnicity														
White	95%	97%	94%	95%	92%	90%	91%	88%	95%	95%	93%	93%	98%	93%
Black	0%	0%	0%	0%	0%	2%	2%	2%	0%	0%	2%	2%	0%	0%
Asian	0%	0%	0%	0%	0%	0%	0%	0%	2%	2%	2%	2%	0%	5%
Other	3%	3%	3%	3%	3%	2%	2%	0%	2%	2%	2%	2%	2%	2%
Unknown	3%	0%	3%	3%	6%	6%	5%	10%	0%	0%	0%	0%	0%	0%
Marital status														
Married	85%	82%	81%	76%	72%	74%	76%	76%	82%	84%	86%	84%	83%	81%
Married to AD	3%	5%	11%	11%	17%	14%	13%	16%	14%	9%	7%	11%	17%	14%
Single	13%	13%	8%	11%	11%	12%	11%	9%	5%	7%	7%	4%	0%	0%
Unknown	0%	0%	0%	3%	0%	0%	0%	0%	0%	0%	0%	0%	0%	5%
Average no. of dependents														
If married	2	2	1	2	2	2	2	2	2	2	2	2	2	2
If married to AD	0	1	1	1	1	0	0	1	1	1	1	1	1	2
If single	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Average YOCs	12.1	12.9	13.1	13.0	12.8	12.1	12.0	12.5	13.0	12.9	13.0	14.0	14.5	14.5
Average YOS	12.2	13.0	13.3	13.2	13.0	12.3	12.1	12.6	13.1	13.1	13.2	14.1	14.7	14.6
Paygrade														
Percent O-3	0%	0%	0%	0%	0%	0%	0%	0%	2%	0%	0%	0%	0%	0%
Percent O-4	47%	32%	37%	32%	28%	44%	55%	53%	41%	47%	41%	29%	31%	36%
Percent O-5	29%	41%	31%	41%	42%	34%	22%	22%	27%	26%	34%	42%	38%	38%
Percent O-6	24%	27%	31%	27%	31%	22%	24%	24%	30%	28%	25%	29%	31%	26%
Percent board certified	72%	68%	67%	68%	58%	50%	64%	71%	66%	60%	57%	71%	64%	62%
Average YOP in Specialty	5.2	6.7	7.1	7.3	7.1	6.2	5.5	5.7	5.8	5.6	6.0	6.9	7.5	7.2
Residents in training	18	20	29	32	34	25	23	23	18	15	14	16	17	18
Fellows	2	1	1	1	2	0	0	0	2	1	1	1	2	0

Trends

Population:

The number of fully trained active duty dermatologists (DMs) in the Navy increased from 39 specialists in FY 1987 to 58 in FY 1994, and subsequently decreased to 42 specialists by FY 2000. The civilian sector, on the other hand, experienced an approximate 34-percent increase in the number of DMs over the last decade, from 7,041 in 1988 to 9,405 in 1999.

Percent of All Duty Specialists:

DMs accounted for about 2 percent of all active duty Navy specialists between FY 1987 and FY 2000, with the exception of FY 1993 and FY 1994 (when they accounted for 3 percent).

Age & Gender:

From FY 1987 to FY 2000, the average age of DMs in the Navy increased slightly from 39 to 42.5 years, and was about 41 years across all years within this time period. Like those in the Navy, DMs in the civilian sector appear to be getting somewhat older. Though the most common age category for civilian DMs was 35 to 44 from 1989 to 1998, by 1999 a larger percentage of DMs were 45 to 54. Furthermore, between 1989 and 1999, the percentage of civilian DMs age 35 and younger fell from about 20 to 15 percent, while the percentage of those age 55 and over increased from about 22 to 29 percent. The percentage of female DMs in the Navy increased from about 10 percent in FY 1987 to 21 percent in FY 2000. The percentage of civilian female DMs also rose throughout the decade, from about 19 percent in 1988 to 32 percent in 1999.

Ethnicity:

The percentage of minority DMs in the Navy rose from about 3 percent in FY 1987 to 7 percent in FY 2000. This increase stems from a rise in the number of Asian DMs, which accounted for 5 percent of DMs in FY 2000. Black DMs accounted for 0 to 2 percent of these specialists over this period and DMs of other race/ethnicity generally accounted for 2 or 3 percent of DMs in most fiscal years.

Marital Status & Dependents:

The percentage of married Navy DMs (not married to active duty (AD) individuals) decreased slightly over the last decade, from 85 percent in FY 1987 to 81 percent in FY 2000. The percentage of those married to AD, however, increased substantially from 3 to 14 percent. The percentage of single Navy DMs also changed dramatically, dropping from 13 percent in FY 1987 to 0 percent by FY 1999. From 1987 to FY 2000, the average number of dependents was 2 for married DMs (not to AD), 1 for DMs married to AD, and 0 for single Navy DMs.

Years of Commissioned Service (YOCs), Years of Service (YOS) & Paygrade:

Both the average YOCs and average YOS increased by 2.4 years from FY 1987 to FY 2000. The average YOCs rose from 12.1 to 14.5 years, whereas the average YOS rose from 12.2 to 14.6 years. During this same time period, most of the Navy's DMs were O-4s. However, in both FY 1998 and FY 1999, O-5s accounted for most of the specialty (about 38 percent in both years). There have been virtually no O-3 DMs over the past decade, and the percentage of O-6s in the specialty ranged from about 22 to 31 percent from FY 1987 to FY 2000.

Board Certification, Experience & Training:

The percentage of board-certified DMs in the Navy decreased from 72 percent in FY 1987 to 62 percent in FY 2000. The civilian sector, on the other hand, consistently maintained 77 to 81 percent of its DMs board certified from 1989 to 1999. The average years of practice (YOP) in specialty for duty Navy DMs increased steadily from 5.2 years in FY 1987 to 7.2 years in FY 2000. The number of DM residents rose from 18 to 34 from FY 1987 to FY 1991, yet returned to 18 residents by FY 2000. The Navy had an average of 1 DM fellow from FY 1987 to FY 2000.

Diagnostic radiology

	FY87	FY88	FY89	FY90	FY91	FY92	FY93	FY94	FY95	FY96	FY97	FY98	FY99	FY00
Duty physicians	83	75	81	93	102	98	105	108	103	108	100	97	96	85
Percent of all duty specialists	5%	4%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	4%
Average age (years)	40.1	41.4	41.2	40.3	39.5	40.0	39.4	40.1	40.4	40.0	40.4	40.5	40.1	40.0
Male physicians	92%	95%	93%	94%	95%	96%	95%	93%	90%	87%	89%	88%	85%	80%
Ethnicity														
White	58%	71%	72%	74%	67%	64%	70%	74%	88%	86%	87%	87%	80%	81%
Black	2%	3%	2%	2%	2%	1%	1%	1%	1%	2%	2%	2%	2%	0%
Asian	1%	1%	2%	3%	4%	4%	4%	3%	3%	3%	4%	4%	6%	5%
Other	10%	11%	9%	8%	7%	7%	6%	6%	6%	6%	2%	0%	1%	2%
Unknown	29%	15%	15%	13%	21%	23%	20%	17%	2%	4%	5%	7%	10%	12%
Marital status														
Married	87%	83%	78%	78%	83%	88%	88%	87%	83%	79%	81%	79%	71%	65%
Married to AD	2%	5%	5%	6%	3%	1%	1%	1%	1%	3%	8%	10%	9%	12%
Single	11%	12%	14%	14%	14%	11%	11%	11%	16%	19%	10%	10%	15%	*
Unknown	0%	0%	4%	1%	0%	0%	0%	1%	0%	0%	1%	0%	5%	22%
Average no. of dependents														
If married	2	2	2	2	2	2	2	1	2	2	2	2	2	2
If married to AD	1	1	1	1	1	1	0	0	0	2	1	1	1	1
If single	0	0	0	0	0	0	0	0	0	0	0	0	0	*
Average YOCS	9.0	10.3	10.2	9.8	9.5	9.7	9.8	10.3	11.1	11.0	11.7	11.8	11.6	11.4
Average YOS	9.4	10.7	10.5	10.2	9.7	9.8	9.9	10.5	11.3	11.3	12.0	12.1	12.0	11.8
Paygrade														
Percent O-3	5%	5%	6%	4%	8%	5%	10%	8%	3%	2%	2%	4%	8%	5%
Percent O-4	45%	39%	43%	48%	48%	47%	50%	50%	53%	56%	44%	40%	40%	46%
Percent O-5	37%	39%	35%	32%	33%	36%	30%	27%	31%	31%	39%	40%	41%	41%
Percent O-6	13%	17%	16%	15%	11%	12%	10%	15%	13%	11%	15%	15%	11%	8%
Percent board certified	63%	60%	60%	65%	62%	59%	70%	52%	48%	55%	62%	68%	69%	66%
Average YOP in Specialty	6.2	6.8	6.5	6.3	5.5	6.1	5.8	6.1	6.1	5.4	5.5	5.6	5.3	5.3
Residents in training	58	62	65	71	72	73	62	55	54	48	41	35	37	40
Fellows	2	1	0	2	8	2	4	7	8	3	5	3	8	7

Trends

Population:

The number of fully trained duty diagnostic radiology (DR) physicians in the Navy remained relatively unchanged from FY 1987 (83 specialists) to FY 2000 (85 specialists), despite a temporary high of 108 specialists in FY 1994 and FY 1996. On the other hand, the number of civilian DR physicians rose consistently over the last decade, from 22,903 specialists in 1988 to 28,870 in 1999—an approximate 26-percent increase.

Percent of All Duty Specialists:

DRs accounted for about 5 percent of all active duty Navy specialists between FY 1987 and FY 2000, with the exception of FY 1988 and FY 2000 (when they accounted for 4 percent).

Age & Gender:

The average age of the Navy's duty DR physicians from FY 1987 to FY 2000 was 40.2 years. In the civilian sector, the most common age group for DR physicians was 35 to 44 years, which accounted for about 29 to 32 percent of these specialists from 1989 to 1999. The percentage of civilian DR physicians age 55 and over increased during this time, from about 21 percent in 1989 to 30 percent in 1999. On the other hand, the percentage of those under age 35 decreased by 9 percentage points over this same time period. The percentage of female DR physicians in the Navy increased from about 8 percent in FY 1987 to 20 percent in FY 2000. The civilian sector also experienced a rise in female DR physicians over the last decade, from about 13 percent in 1988 to 30 percent in 1999.

Ethnicity:

The Navy experienced a decrease in the percentage of minority DR physicians from about 19 percent in FY 1987 to 8 percent in FY 2000. The percentage DR physicians categorized as other race or ethnicity had the largest drop over this time period, from 14 to 3 percent. The percentage of black DR physicians in the Navy remained at 3 percent or lower over the last decade.

Marital Status & Dependents:

The percentage of married Navy DR physicians decreased from 87 percent in FY 1987 to 65 percent in FY 2000. The percentage of those married to AD, however, increased from 2 to 12 percent. The percentage of single Navy DR physicians ranged from 10 to 19 percent throughout most of the decade. From FY 1987 to FY 2000, the average number of dependents was 2 for married DR physicians (not to AD), and 0 for single DR physicians. The average number of dependents ranged from 0 to 2 for DR physicians married to AD, with an average of 1 dependent from FY 1987 to FY 2000.

Years of Commissioned Service (YOCs), Years of Service (YOS) & Paygrade:

Both the average YOCs and average YOS rose by about 2 years from FY 1987 to FY 2000, from 9.0 to 11.4 years for YOCs and 9.4 to 11.8 years for YOS. The majority of DR physicians in the Navy were either O-4s or O-5s over the past decade, accounting for about 82 percent in FY 1987 and 87 percent in FY 2000. O-3s remained the smallest percentage of Navy DR physicians, at 5 percent in both FY 1987 and FY 2000. The percentage of O-6s decreased from about 13 to 8 percent during this same time period.

Board Certification, Experience & Training:

The percentage of board-certified DR physicians in the Navy increased, from about 63 percent in FY 1987 to 66 percent in FY 2000. The civilian sector also witnessed a rise in board-certified DR physicians, from about 77 to 80 percent between 1989 and 1999. The average years of practice (YOP) in specialty for duty Navy DRs decreased slightly from 6.2 to 5.3 years from FY 1987 to FY 2000. The number of DR residents in the Navy fell during this same time period, from 58 to 40 residents, despite a rise in the number of residents between FY 1987 and FY 1992. The number of Navy DR fellows increased from 2 fellows in FY 1987 to 7 in FY 2000.

* FY 2000 marital status and dependents data for singles have been excluded because 22 percent of the data are missing and the values are inconsistent with those of previous years.

Emergency medicine

	FY87	FY88	FY89	FY90	FY91	FY92	FY93	FY94	FY95	FY96	FY97	FY98	FY99	FY00
Duty physicians	27	39	37	43	48	51	61	68	69	74	75	87	94	113
Percent of all duty specialists	2%	2%	2%	2%	2%	3%	3%	3%	4%	4%	4%	4%	4%	5%
Average age (years)	34.7	35.8	36.4	37.0	37.4	37.3	37.9	38.3	38.4	38.2	38.9	38.3	38.9	38.9
Male physicians	93%	92%	86%	88%	90%	88%	92%	93%	93%	96%	95%	90%	87%	88%
Ethnicity														
White	59%	77%	89%	86%	79%	73%	74%	79%	91%	91%	92%	87%	87%	88%
Black	4%	3%	3%	2%	0%	0%	0%	0%	0%	1%	1%	1%	1%	2%
Asian	0%	0%	0%	0%	0%	0%	0%	0%	1%	1%	1%	2%	3%	2%
Other	0%	0%	3%	2%	2%	2%	2%	1%	1%	1%	0%	0%	0%	0%
Unknown	37%	21%	5%	9%	19%	25%	25%	19%	6%	5%	5%	9%	9%	9%
Marital status														
Married	70%	72%	65%	74%	73%	69%	77%	74%	71%	69%	69%	63%	67%	67%
Married to AD	4%	5%	5%	7%	6%	8%	8%	4%	6%	4%	5%	6%	4%	6%
Single	26%	23%	30%	19%	21%	24%	15%	19%	23%	27%	25%	29%	27%	*
Unknown	0%	0%	0%	0%	0%	0%	0%	3%	0%	0%	0%	2%	2%	24%
Average no. of dependents														
If married	2	2	2	2	2	2	2	2	2	2	2	2	2	2
If married to AD	0	1	1	1	0	1	1	1	1	1	1	0	1	1
If single	0	0	0	0	0	0	0	0	0	0	0	0	0	*
Average YOCS	6.2	7.6	8.8	8.9	8.6	8.8	9.3	9.6	10.1	10.0	10.8	10.0	10.3	10.3
Average YOS	6.5	7.8	9.0	9.1	8.8	9.2	10.0	10.4	11.0	10.6	11.3	10.3	10.5	10.5
Paygrade														
Percent O-3	33%	13%	14%	14%	10%	8%	3%	3%	9%	8%	4%	9%	6%	12%
Percent O-4	41%	59%	46%	49%	54%	57%	70%	60%	57%	57%	52%	51%	53%	50%
Percent O-5	22%	23%	32%	26%	19%	20%	15%	26%	25%	30%	39%	38%	35%	32%
Percent O-6	4%	5%	8%	12%	17%	16%	11%	10%	10%	5%	5%	2%	5%	7%
Percent board certified	19%	38%	43%	40%	29%	37%	41%	53%	58%	62%	63%	57%	53%	57%
Average YOP in Specialty	1.7	2.1	3.0	3.5	3.8	3.5	3.3	3.7	3.1	3.1	3.7	3.1	3.8	3.9
Residents in training	24	20	37	44	50	48	45	43	47	49	50	49	48	47
Fellows	0	0	0	0	0	0	0	0	0	0	2	3	1	1

Trends

Population:

The number of fully trained duty emergency medicine (EM) physicians in the Navy rose dramatically over the last decade, from 27 specialists in FY 1987 to 113 in FY 2000. The civilian sector also witnessed an increase in EM physicians, from 12,925 specialists in 1988 to 22,025 in 1999—an approximate 70-percent increase.

Percent of All Duty Specialists:

From FY 1987 to FY 2000, the percentage of EM physicians increased from 2 to 5 percent of all active duty Navy specialists.

Age & Gender:

The average age of Navy EM physicians increased from 34.7 years in FY 1987 to 38.9 in FY 2000, with an overall average of 37.6 years during this time period. EM physicians in the civilian sector also appear to have gotten older over the last decade. Though the most common age group for civilian EM physicians was 35 to 44 years from 1989 to 1997, it was 45 to 54 years in both 1998 and 1999. Furthermore, from 1989 to 1999, the percentage of civilian EM physicians age 55 and over rose from about 11 to 14 percent, while the percentage of those under age 35 fell from about 27 to 22 percent. The Navy experienced an increase in the percentage of female EM physicians over the last decade, from about 7 percent in FY 1987 to 12 percent in FY 2000. The percentage of female EM physicians in the civilian sector also rose, from about 14 percent in 1988 to 19 percent in 1999.

Ethnicity:

The percentage of minority EM physicians in the Navy decreased from 6 to 4 percent from FY 1987 to FY 2000. As of FY 2000, 96 percent were Caucasian, 2 percent were black, and 2 percent were Asian.

Marital Status & Dependents:

The composition of Navy EM physicians by marital status changed little over the past decade. Between FY 1987 and FY 2000, the percentage of married Navy EM physicians (not married to active duty (AD) individuals) ranged from 63 to 77 percent, whereas that of Navy EM physicians married to AD ranged from 4 to 8 percent. The percentage of single Navy ADs ranged between 15 and 30 percent throughout most of the decade. From FY 1987 to FY 2000, the average number of dependents was 2 for EM physicians married (not to AD), 1 for those married to AD, and 0 for single EM physicians.

Years of Commissioned Service (YOCs), Years of Service (YOS) & Paygrade:

The average YOCs rose from 6.2 to 10.3 years for Navy EM physicians from FY 1987 to FY 2000. During this time, the average YOS also rose by 4 years, from 6.5 to 10.5 years. From FY 1987 to FY 2000, the percentage of O-3 EM physicians in the Navy dropped from 33 to 12 percent, while the percentage of O-4s and O-5s each rose by 9 to 10 percentage points. The percentage of O-6 EM physicians increased as well, from 4 percent in FY 1987 to 7 percent in FY 2000.

Board Certification, Experience & Training:

The percentage of board-certified Navy EM physicians increased considerably over the past decade—from 19 percent in FY 1987 to 57 percent in FY 2000. The percentage of civilian EM physicians who were board certified also rose, from about 54 to 64 percent from 1989 to 1999. The average years of practice (YOP) in specialty for duty Navy EMs increased from 1.7 years in FY 1987 to 3.9 years in FY 2000. The number of Navy EM residents rose from 24 to 47 residents during this time, with an average of 43 residents. The Navy had 1 to 3 EM fellows from FY 1997 to FY 2000.

* FY 2000 marital status and dependents data for singles have been excluded because 24 percent of the data are missing and the values are inconsistent with those of previous years.

Family practice medicine

	FY87	FY88	FY89	FY90	FY91	FY92	FY93	FY94	FY95	FY96	FY97	FY98	FY99	FY00
Duty physicians	202	192	208	224	248	231	249	250	263	265	290	323	363	402
Percent of all duty specialists	12%	11%	12%	12%	13%	12%	12%	12%	13%	13%	14%	16%	17%	19%
Average age (years)	35.7	36.0	36.2	35.9	36.6	37.1	38.0	38.3	39.0	39.4	38.7	38.2	38.2	38.3
Male physicians	89%	89%	89%	90%	92%	91%	92%	90%	89%	86%	85%	84%	82%	80%
Ethnicity														
White	81%	82%	88%	87%	86%	85%	86%	87%	89%	89%	86%	79%	77%	77%
Black	1%	3%	2%	2%	2%	3%	4%	4%	5%	5%	4%	4%	4%	3%
Asian	1%	2%	2%	2%	2%	2%	2%	1%	2%	3%	3%	4%	5%	4%
Other	1%	2%	1%	1%	1%	1%	1%	2%	1%	2%	1%	1%	1%	1%
Unknown	16%	12%	7%	8%	9%	8%	7%	7%	3%	2%	5%	12%	13%	14%
Marital status														
Married	81%	83%	82%	79%	82%	80%	83%	82%	81%	79%	76%	72%	71%	68%
Married to AD	5%	5%	3%	4%	4%	6%	6%	5%	6%	7%	9%	9%	8%	8%
Single	13%	12%	15%	17%	14%	14%	11%	12%	13%	14%	15%	14%	13%	*
Unknown	0%	0%	0%	1%	0%	0%	0%	1%	0%	0%	0%	5%	9%	23%
Average no. of dependents														
If married	2	2	2	2	2	2	2	2	2	2	2	2	2	2
If married to AD	0	1	1	1	1	1	1	1	1	1	1	1	1	0
If single	0	0	0	0	0	0	0	0	0	0	0	0	0	*
Average YOCs	7.7	8.0	8.1	7.5	8.0	8.3	9.0	9.5	9.8	10.2	10.0	9.2	9.4	9.6
Average YOS	8.0	8.3	8.5	7.9	8.4	8.7	9.5	9.9	10.3	10.7	10.4	9.6	9.7	10.1
Paygrade														
Percent O-3	23%	16%	14%	18%	21%	19%	21%	18%	23%	28%	32%	32%	31%	32%
Percent O-4	48%	52%	56%	54%	52%	50%	45%	44%	35%	22%	26%	30%	36%	37%
Percent O-5	22%	24%	22%	21%	19%	24%	25%	27%	28%	34%	27%	25%	21%	19%
Percent O-6	7%	8%	9%	7%	8%	6%	9%	11%	13%	17%	15%	13%	13%	13%
Percent board certified	78%	80%	78%	81%	81%	87%	82%	79%	77%	80%	80%	80%	72%	79%
Average YOP in Specialty	3.4	3.6	3.6	3.4	4.0	4.4	4.7	5.1	5.7	6.3	5.9	5.3	5.3	5.3
Residents in training	82	92	92	96	84	90	76	79	88	90	82	76	81	71
Fellows	0	0	0	0	0	0	3	7	5	3	5	7	1	5

Trends

Population:

The number of Navy fully trained (duty) family practice (FP) physicians doubled over the last decade, from 202 specialists in FY 1987 to 402 in FY 2000. The civilian sector also experienced a noticeable rise in FP physicians, with an approximate 54-percent increase from 1988 to 1999.

Percent of All Duty Specialists:

From FY 1987 to FY 2000, the percentage of FP physicians increased substantially from 12 to 19 percent of all active duty Navy specialists.

Age & Gender:

The average age of Navy duty FP physicians from FY 1987 to FY 2000 was 37.5 years. The most common age group for civilian FP physicians from 1989 to 1999 was 35 to 44 years. The civilian sector also experienced an increase in the percentage of FP physicians age 45 to 54, from about 15 percent in 1992 to 29 percent in 1999. The percentage of female FP physicians increased both in the Navy and in the civilian sector. In FY 1989, about 11 percent of Navy physicians were female compared to 18 percent in FY 1999. The civilian sector showed a 10-percentage-point increase in female FP physicians from 17 to 27 percent over the same time period.

Ethnicity:

The percentage of minority FP physicians in the Navy increased from 4.2 percent in FY 1987 to 10.4 percent in FY 2000. More than half of this increase was due to a rise in Asian FP physicians, who accounted for only 1.2 percent of FP physicians in 1987 but 4.9 percent in FY 2000.

Marital Status & Dependents:

The percentage of married Navy FP physicians (not married to active duty (AD) individuals) decreased from 81 percent in FY 1987 to 68 percent in FY 2000, whereas the percentage of those married to AD increased from 5 to 8 percent during this same time period. The percentage of single Navy FP physicians ranged from 11 to 15 percent throughout most of the decade. The average number of dependents for Navy FP physicians remained constant over the past decade: 2 for married specialists (not to AD), 1 for those married to AD, and 0 for single FP physicians.

Years of Commissioned Service (YOCs), Years of Service (YOS) & Paygrade:

Both the YOCs and the YOS for duty FP physicians increased from about 8 to 10 years between FY 1987 and FY 2000. The composition of duty FP physicians by paygrade became more uniform throughout the decade. In every year from FY 1987 to FY 1992, close to half of all FP physicians were O-4s. However, by FY 2000 only 37 percent of FP physicians were O-4s. The percentage of O-3 FP physicians increased from approximately 23 percent in FY 1987 to 32 percent in FY 2000. The percentage of O-6 FP physicians rose from about 7 to 13 percent during the same time period.

Board Certification, Experience & Training:

The average percentage of duty FP physicians that were board certified fluctuated between 72 and 87 percent between FY 1987 and FY 2000. There does not appear to be any systematic trend over this period. In the civilian sector, the average percentage of board-certified physicians from 1992 to 1999 was about 70 percent. The average years of practice (YOP) in specialty for duty Navy FPs ranged from 3 to 6 years throughout the past decade. In FY 1998, FY 1999, and FY 2000, the average YOP remained at about 5. The average number of FP residents from FY 1987 to FY 2000 was approximately 84. The number of FP residents reached a high of 96 in FY 1990. Since then, the number of residents gradually decreased to 71 by FY 2000. The average number of FP fellows from FY 1993 to FY 2000 was about 4.

* FY 2000 marital status and dependents data for singles have been excluded because 23 percent of the data are missing and the values are inconsistent with those of previous years.

General surgery

	FY87	FY88	FY89	FY90	FY91	FY92	FY93	FY94	FY95	FY96	FY97	FY98	FY99	FY00
Duty physicians	99	112	138	148	157	161	153	138	127	116	110	105	109	104
Percent of all duty specialists	6%	7%	8%	8%	8%	8%	7%	7%	6%	6%	5%	5%	5%	5%
Average age (years)	40.1	40.1	41.3	41.8	42.5	42.2	41.2	41.1	41.5	42.4	42.4	42.2	42.0	42.7
Male physicians	96%	94%	94%	96%	96%	96%	97%	95%	93%	91%	90%	86%	86%	84%
Ethnicity														
White	69%	76%	76%	78%	73%	76%	78%	81%	88%	88%	85%	81%	72%	70%
Black	3%	3%	3%	2%	2%	2%	1%	1%	3%	3%	4%	4%	4%	4%
Asian	2%	2%	2%	3%	3%	2%	3%	4%	5%	4%	5%	6%	6%	7%
Other	5%	4%	4%	3%	3%	2%	3%	4%	4%	4%	5%	5%	6%	4%
Unknown	21%	15%	15%	14%	20%	17%	14%	10%	0%	0%	3%	5%	13%	15%
Marital status														
Married	83%	77%	76%	81%	84%	81%	84%	84%	84%	82%	82%	74%	70%	66%
Married to AD	1%	2%	4%	3%	4%	5%	5%	2%	0%	0%	0%	1%	2%	3%
Single	16%	20%	16%	15%	11%	14%	12%	12%	15%	18%	18%	24%	19%	*
Unknown	0%	2%	4%	1%	1%	1%	0%	2%	1%	0%	0%	1%	9%	29%
Average no. of dependents														
If married	2	2	2	2	2	2	2	2	2	2	2	2	2	2
If married to AD	1	0	0	1	0	1	1	0	0	0	0	0	2	1
If single	0	0	0	0	0	0	0	0	0	0	0	0	0	*
Average YOCs	8.2	7.3	6.4	6.0	6.8	6.5	6.8	7.2	7.6	8.4	9.2	10.1	9.9	10.8
Average YOS	8.4	7.5	6.5	6.2	7.0	6.7	7.0	7.3	7.8	8.5	9.4	10.2	10.0	10.9
Paygrade														
Percent O-3	14%	8%	3%	7%	5%	7%	10%	2%	3%	3%	4%	5%	6%	6%
Percent O-4	41%	52%	56%	51%	52%	49%	50%	60%	58%	53%	49%	49%	47%	45%
Percent O-5	19%	17%	20%	22%	22%	24%	23%	20%	22%	28%	31%	28%	28%	27%
Percent O-6	24%	23%	22%	20%	21%	20%	16%	17%	17%	16%	16%	19%	18%	21%
Percent board certified	63%	60%	62%	57%	57%	58%	63%	64%	69%	71%	72%	71%	69%	70%
Average YOP in Specialty	7.7	3.6	3.6	3.4	4.0	4.4	4.7	5.1	5.7	6.3	5.9	5.3	5.3	5.3
Residents in training	55	53	56	61	58	57	53	48	43	43	38	39	41	40
Fellows	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Trends

Population:

The number of fully trained duty general surgeons (GSs) in the Navy increased only slightly over the past decade, from 99 specialists in FY 1987 to 104 in FY 2000, with a high of 161 specialists in FY 1992. The number of civilian GSs rose by a small amount compared to those in other civilian specialties, from 37,792 to 39,311 between 1988 and 1999—only a 4-percent increase.

Percent of All Duty Specialists:

From FY 1987 to FY 1990, the percentage of GSs increased from 6 to 8 percent of all active duty Navy specialists, yet decreased to 5 percent by FY 2000.

Age & Gender:

The average age of Navy GSs from FY 1987 to FY 2000 was 41.7 years. From 1989 to 1996, about 25 to 29 percent of civilian GSs were under age 35, the most common age group during that time. From 1997 to 1999, however, most civilian GSs were age 35 to 44 (from about 23 to 24 percent) and nearly 23 percent were age 45 to 54. The percentage of civilian GSs in age groups 55 to 64 years and 65 and older also increased during this time. The percentage of female Navy GSs increased from 4 percent in FY 1987 to 16 percent in FY 2000. The civilian sector experienced a less dramatic increase in the percentage of female GSs, from about 6 to 9 percent between 1988 and 1999.

Ethnicity:

The percentage of minority Navy GSs rose from 13 percent in FY 1987 to 18 percent in FY 2000. During this same time period, black GSs in the Navy ranged from 2 to 5 percent, Asians from 3 to 8 percent, and those categorized as other race or ethnicity from 2 to 6 percent.

Marital Status & Dependents:

The percentage of married Navy GSs (not married to active duty (AD) individuals) decreased from 83 percent in FY 1987 to 66 percent in FY 2000. The percentage of those married to AD changed little, ranging from 0 to 5 percent during this same time period. The percentage of single GSs increased slightly throughout most of the decade, from 16 percent in FY 1987 to 19 percent in FY 1999. From FY 1987 to FY 2000, the average number of dependents was 2 for married GSs (not to AD) and 0 for single GSs. The average number of dependents for GSs married to AD ranged from 0 to 2 from during this same time period.

Years of Commissioned Service (YOCs), Years of Service (YOS) & Paygrade:

Both the average YOCs and average YOS for duty GSs increased from about 8 in FY 1987 to 11 in FY 2000. Most GSs were O-4s during this same time period, ranging from 41 to 56 percent of the Navy GS population. The percentage of O-3s and O-6s both decreased from FY 1987 to FY 2000, while the percentage of O-5s increased from 19 to 27 percent.

Board Certification, Experience & Training:

The percentage of board-certified GSs in the Navy increased from 63 percent in FY 1987 to 70 percent in FY 2000. The civilian sector also experienced a 7-percent-point increase in board-certified GSs over the last decade, from about 58 percent in 1989 to 65 percent in 1999. The average years of practice (YOP) in specialty for duty Navy GSs fell from 7.7 years in FY 1987 to only 4 years in FY 1991, but subsequently rose to 5.3 years by FY 2000—an overall decrease of 2.4 years. The number of GS residents decreased from 55 residents in FY 1987 to 40 in FY 2000.

* FY 2000 marital status and dependents data for singles have been excluded because 29 percent of the data are missing and the values are inconsistent with those of previous years.

General surgery subspecialties

	FY87	FY88	FY89	FY90	FY91	FY92	FY93	FY94	FY95	FY96	FY97	FY98	FY99	FY00
Duty physicians	35	35	35	32	40	39	35	44	54	52	55	56	58	55
Percent of all duty specialists	2%	2%	2%	2%	2%	2%	2%	2%	3%	3%	3%	3%	3%	3%
Average age (years)	38.8	39.0	38.5	39.6	39.2	39.2	39.9	39.8	40.6	41.9	42.5	43.4	44.2	45.0
Male physicians	94%	94%	91%	88%	88%	87%	89%	86%	89%	90%	91%	91%	90%	85%
Ethnicity														
White	74%	83%	80%	78%	73%	72%	80%	84%	89%	88%	85%	86%	84%	89%
Black	6%	6%	6%	6%	5%	5%	6%	5%	2%	2%	2%	2%	2%	2%
Asian	0%	0%	3%	3%	5%	8%	6%	5%	6%	6%	5%	5%	9%	7%
Other	3%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Unknown	17%	11%	11%	13%	18%	15%	9%	7%	4%	4%	7%	7%	5%	2%
Marital status														
Married	71%	77%	86%	91%	88%	87%	89%	89%	87%	83%	82%	79%	74%	73%
Married to AD	3%	3%	3%	3%	3%	3%	0%	2%	2%	6%	5%	7%	5%	5%
Single	23%	20%	11%	6%	10%	10%	11%	9%	9%	12%	13%	14%	16%	*
Unknown	3%	0%	0%	0%	0%	0%	0%	0%	2%	0%	0%	0%	5%	18%
Average no. of dependents														
If married	2	2	1	2	2	2	2	1	2	2	2	2	2	2
If married to AD	3	4	0	0	0	2	2	2	2	2	1	1	1	1
If single	0	0	0	0	0	0	0	0	0	0	0	0	0	*
Average YOCS	9.5	10.7	9.8	10.4	10.3	8.8	8.8	9.8	10.4	11.6	10.8	11.5	12.7	13.2
Average YOS	10.1	11.3	9.9	10.5	10.4	9.0	8.9	9.8	10.4	11.5	10.8	11.4	12.7	13.3
Paygrade														
Percent O-3	3%	3%	0%	3%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Percent O-4	43%	29%	40%	34%	43%	51%	46%	34%	39%	29%	31%	27%	21%	16%
Percent O-5	43%	54%	43%	41%	28%	28%	40%	52%	46%	54%	47%	50%	57%	56%
Percent O-6	11%	14%	17%	22%	30%	21%	14%	14%	15%	17%	22%	23%	22%	27%
Percent board certified	14%	14%	11%	28%	28%	21%	31%	27%	31%	37%	35%	30%	28%	24%
Average YOP in Primary Specialty	6.2	6.5	6.3	7.7	7.0	6.6	7.4	6.9	7.9	9.1	9.9	10.8	11.0	11.5
Average YOP in Subspecialty	3.8	3.6	3.3	4.5	4.1	3.7	4.3	3.9	5.0	5.9	6.6	7.3	7.6	8.1
Fellows	8	5	5	11	9	12	15	11	12	11	13	10	9	8

Trends

Population:

The number of fully trained duty surgical subspecialists (SSPSRGs) in the Navy increased over the last decade, from 35 specialist in FY 1987 to 55 in FY 2000. The civilian sector, however, experienced an overall decrease in SSPSRGs from 7,340 specialists in 1988 to 7,235 in 1999—despite an increase during the first half of the decade to 9,219 specialists in FY 1996.

Percent of All Duty Specialists:

From FY 1987 to FY 2000, the percentage of SSPSRGs increased from 2 to 3 percent of all active duty Navy specialists.

Age & Gender:

The average age for Navy SSPSRGs increased from 38.8 years in FY 1987 to 45.0 years in FY 2000. Civilian SSPSRGs also appear to have gotten slightly older in the last decade. The percentage of those under age 35 decreased from about 11 to 8 percent between 1989 and 1999, while those 35 to 44 years fell from 34 to 30 percent. From 1989 to 1999, there were also percentage increases in civilian SSPSRGs age 45 to 54 (from 29 to 31 percent), age 55 to 64 (from 17 to 21 percent), and age 65 and older (from 9 to 10 percent). The percentage of female SSPSRGs in the Navy increased from about 6 percent in FY 1987 to 15 percent in FY 2000, whereas the percentage of those in the civilian sector rose from about 4 to 9 percent between 1988 and 1999.

Ethnicity:

The percentage of minority Navy SSPSRGs ranged from 6 to 15 percent from FY 1987 to FY 2000. The percentage of black Navy SSPSRGs decreased from 7 to 2 percent between FY 1987 and FY 2000, while that of Asian SSPSRGs increased from 0 to 7 percent. In all fiscal years, except for FY 1987, there were no Navy SSPSRGs categorized as other race or ethnicity.

Marital Status & Dependents:

The percentage of married Navy SSPSRGs (not married to active duty (AD) individuals) increased during the first half of the decade, from 71 percent in FY 1987 to 89 percent in FY 1993, and subsequently decreased to 73 percent by FY 2000. The percentage of those married to AD increased from 3 to 5 percent between FY 1987 and FY 2000, whereas the percentage of single Navy SSPSRGs decreased from 23 to 16 percent between FY 1987 and FY 1999. Between FY 1987 and FY 2000, the average number of dependents for married Navy SSPSRGs was 2 in most years, and ranged from 0 to 4 dependents for those married to AD. The average number of dependents for single SSPSRGs was 0 during this time.

Years of Commissioned Service (YOCs), Years of Service (YOS) & Paygrade:

The average YOCs for Navy SSPSRGs increased from 9.5 years in FY 1987 to 13.2 years in FY 2000, while the average YOS rose from 10.1 to 13.3 years. In FY 1987, most SSPSRGs were either O-4s or O-5s (both at 43 percent). However, by FY 2000, the percentage of O-4s fell to 16 percent, while the percentage of O-5s grew to 56 percent. No more than 3 percent of Navy SSPSRGs were O-3s from FY 1987 to FY 2000. The percentage of O-6s increased from 11 to 27 percent during this same time period.

Board Certification, Experience & Training:

The percentage of board-certified Navy SSPSRGs increased throughout the decade, from 14 percent in FY 1987 to 24 percent in FY 2000. The percentage of civilian board-certified SSPSRGs, on the other hand, varied throughout the decade, ranging from about 74 to 83 percent between 1989 and 1999. The average years of practice (YOP) in primary specialty for duty Navy SSPSRGs increased from 6.2 years in FY 1987 to 11.5 years in FY 2000. Similarly, the average YOP in subspecialty for Navy SSPSRGs increased from 3.8 to 8.1 years. The number of Navy SSPSRG fellows rose from 8 to 15 between FY 1987 and FY 1993, yet returned to 8 fellows by FY 2000.

* FY 2000 marital status and dependents data for singles have been excluded because 18 percent of the data are missing and the values are inconsistent with those of previous years.

Internal medicine

	FY87	FY88	FY89	FY90	FY91	FY92	FY93	FY94	FY95	FY96	FY97	FY98	FY99	FY00
Duty physicians	151	152	134	120	114	106	101	116	119	130	136	139	132	116
Percent of all duty specialists	9%	9%	8%	7%	6%	5%	5%	6%	6%	7%	7%	7%	6%	5%
Average age (years)	36.0	35.7	36.7	37.4	38.0	39.4	38.8	38.4	38.0	37.5	36.4	36.2	36.6	36.3
Male physicians	83%	82%	83%	86%	84%	85%	82%	78%	76%	78%	78%	78%	73%	68%
Ethnicity														
White	51%	66%	79%	77%	77%	78%	80%	83%	87%	85%	79%	81%	78%	77%
Black	1%	3%	3%	4%	3%	3%	3%	3%	4%	4%	4%	4%	4%	4%
Asian	3%	2%	1%	2%	3%	3%	3%	3%	3%	5%	4%	4%	5%	5%
Other	5%	5%	5%	6%	5%	5%	6%	5%	4%	4%	4%	4%	5%	4%
Unknown	40%	24%	12%	12%	12%	11%	8%	6%	2%	2%	7%	9%	8%	9%
Marital status														
Married	74%	71%	73%	74%	71%	69%	69%	66%	62%	58%	64%	64%	59%	58%
Married to AD	9%	7%	7%	8%	8%	8%	10%	12%	11%	12%	11%	11%	11%	12%
Single	17%	22%	18%	18%	20%	24%	21%	22%	27%	31%	25%	25%	28%	*
Unknown	1%	0%	2%	0%	1%	0%	0%	1%	0%	0%	0%	0%	2%	28%
Average no. of dependents														
If married	1	1	1	1	1	1	2	2	2	1	1	1	2	1
If married to AD	1	1	1	1	1	1	1	1	1	1	1	1	1	1
If single	0	0	0	0	0	0	0	0	0	0	0	0	0	*
Average YOCs	7.1	6.4	6.6	6.8	7.7	8.6	8.1	8.0	7.5	7.5	7.3	7.6	8.2	8.2
Average YOS	7.2	6.5	6.8	7.0	7.8	8.7	8.3	8.3	7.8	7.7	7.6	7.8	8.4	8.4
Paygrade														
Percent O-3	28%	34%	27%	14%	14%	18%	24%	34%	43%	47%	50%	46%	38%	34%
Percent O-4	38%	37%	44%	54%	50%	40%	39%	30%	28%	29%	31%	34%	41%	46%
Percent O-5	18%	16%	14%	17%	21%	26%	23%	19%	12%	12%	9%	9%	10%	11%
Percent O-6	16%	13%	14%	15%	14%	16%	14%	17%	17%	12%	10%	11%	11%	8%
Percent board certified	56%	55%	68%	62%	58%	62%	60%	52%	56%	54%	60%	81%	77%	68%
Average YOP in Specialty	5.2	4.7	5.5	6.0	6.5	7.6	7.1	6.9	6.1	5.6	4.8	4.7	4.9	4.6
Residents in training	65	61	66	70	56	71	72	70	83	66	53	56	56	53
Fellows	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Trends

Population:

The number of fully trained duty internal medicine (IM) physicians in the Navy decreased gradually over the last decade, from 151 specialists in FY 1987 to 116 in FY 2000. The number of civilian IM physicians, on the other hand, increased from 94,674 specialists in 1988 to 128,709 in 1999—an approximate 36-percent increase.

Percent of All Duty Specialists:

From FY 1987 to FY 2000, the percentage of IM physicians decreased from 9 to 5 percent of all active duty Navy specialists.

Age & Gender:

The average age of IM physicians in the Navy changed little, ranging from 35.7 to 39.4 years and having an average of 37.2 years from FY 1987 to FY 2000. The civilian sector, on the other hand, experienced an increase in the age of IM physicians during this time. In 1989, the two most common age categories for civilian IM physicians were under 35 years and 35 to 44 years—each at about 33 to 34 percent. By 1999, however, the majority of civilian IM physicians were in age categories 35 to 44 years and 45 to 54 years—with the percentage of those age 45 to 54 years having risen from about 16 to 27 percent over this time period. The percentage of civilian IM physicians 55 to 64 years and 65 years and older also increased from 1989 to 1999. In FY 1987, about 14 percent of Navy IM physicians were female. Since then, the percentage of female duty IM physicians increased to 32 percent by FY 2000—with about 10 percent of this rise occurring between FY 1998 and FY 2000. The percentage of female IM physicians in the civilian sector rose as well, from 18 to 27 percent between 1988 and 1999.

Ethnicity:

The percentage of minority IM physicians in the Navy has varied little over the last decade, increasing only 2 percentage points, from 14 percent in FY 1987 to 16 percent in FY 2000. The composition of the minority Navy IM population changed somewhat, however, with a 3-percentage-point increase in black IM physicians and 2-percentage-point increase in Asian IM physicians over the same time period. Navy IM physicians categorized as other race or ethnicity dropped by 3 percentage points between FY 1987 and FY 2000.

Marital Status & Dependents:

The percentage of married Navy IM physicians (not married to active duty (AD) individuals) decreased from 74 to 58 percent between FY 1987 and FY 2000, whereas the percentage of those married to AD increased slightly from 9 to 12 percent. The percentage of single Navy IM physicians also increased throughout most of the decade, from 17 percent in FY 1987 to 28 percent in FY 1999. From FY 1987 to FY 2000, the average number of dependents was 1 for married Navy IM physicians (both to and not to AD) and 0 for single IM physicians.

Years of Commissioned Service (YOCs), Years of Service (YOS) & Paygrade:

Both the average YOCs and average YOS for Navy IM physicians increased slightly over the last decade, from about 7 to 8 years between FY 1987 and FY 2000. During this same time, there was an increase in the percentage of O-3s, from 28 to 34 percent. Despite the rise in O-3s, most Navy IM physicians were O-4s by FY 2000—approximately 46 percent. The percentage of O-5s decreased from 18 percent in FY 1987 to 11 percent in FY 2000. There was a similar decrease in O-6s.

Board Certification, Experience & Training:

The percentage of board-certified Navy IM physicians increased over the last decade, from 56 percent in FY 1987 to 68 percent in FY 2000. The civilian sector also experienced a rise in board-certified IM physicians, from about 54 to 68 percent between 1989 and 1999. Although the average years of practice (YOP) in specialty for duty Navy IMs rose during the first half of the decade, it decreased slightly from FY 1987 to FY 2000, from 5.2 to 4.6 years. The number of IM residents increased during the first half of the decade, yet experienced an overall drop from 65 to 53 residents between FY 1987 and FY 2000. During this same time, the number of IM fellows increased slightly from 39 to 43 fellows—having reached a high of 94 fellows in FY 1989 and 1990.

* FY 2000 marital status and dependents data for singles have been excluded because 28 percent of the data are missing and the values are inconsistent with those of previous years.

Internal medicine subspecialties

	FY87	FY88	FY89	FY90	FY91	FY92	FY93	FY94	FY95	FY96	FY97	FY98	FY99	FY00
Duty physicians	121	109	123	157	194	199	230	212	148	149	150	146	148	155
Percent of all duty specialists	7%	6%	7%	9%	10%	10%	11%	10%	8%	8%	7%	7%	7%	7%
Average age (years)	37.6	38.6	38.5	38.9	39.3	39.3	39.7	40.4	40.5	41.1	41.8	41.7	41.4	41.3
Male physicians	94%	94%	93%	94%	92%	91%	90%	92%	90%	89%	88%	88%	82%	83%
Ethnicity														
White	86%	90%	87%	88%	86%	86%	84%	87%	91%	91%	89%	90%	89%	90%
Black	1%	1%	2%	2%	2%	1%	1%	0%	1%	2%	3%	4%	4%	4%
Asian	0%	1%	1%	0%	0%	1%	1%	1%	3%	3%	3%	2%	1%	2%
Other	2%	2%	2%	2%	2%	2%	2%	3%	3%	2%	3%	3%	3%	3%
Unknown	11%	6%	8%	8%	11%	10%	12%	8%	3%	1%	1%	1%	3%	1%
Marital status														
Married	79%	82%	80%	78%	77%	78%	79%	82%	82%	81%	79%	77%	74%	71%
Married to AD	7%	9%	9%	6%	8%	10%	8%	8%	7%	8%	8%	8%	9%	11%
Single	14%	9%	11%	15%	14%	12%	13%	10%	11%	11%	13%	15%	16%	*
Unknown	0%	0%	1%	0%	1%	0%	0%	0%	0%	0%	0%	0%	1%	17%
Average no. of dependents														
If married	2	2	2	2	2	2	2	2	2	2	2	2	2	2
If married to AD	1	2	2	2	1	1	1	1	1	1	1	1	1	1
If single	0	0	0	0	0	0	0	0	0	0	0	0	0	*
Average YOCS	9.7	10.9	10.5	10.1	10.4	10.4	10.8	11.4	11.7	12.3	13.0	13.1	13.1	13.3
Average YOS	9.8	11.0	10.6	10.1	10.5	10.5	10.8	11.5	11.8	12.4	13.1	13.2	13.1	13.3
Paygrade														
Percent O-3	1%	0%	1%	3%	3%	1%	1%	0%	1%	0%	1%	2%	2%	2%
Percent O-4	48%	35%	34%	39%	39%	45%	43%	36%	30%	31%	25%	29%	35%	39%
Percent O-5	31%	42%	44%	34%	34%	31%	33%	37%	41%	40%	43%	41%	37%	29%
Percent O-6	20%	23%	21%	24%	24%	23%	23%	27%	28%	29%	31%	27%	25%	29%
Percent board certified	36%	36%	30%	31%	34%	36%	37%	36%	39%	38%	35%	33%	28%	25%
Average YOP in Primary Specialty	7.4	8.4	8.3	8.8	9.2	9.0	9.0	9.6	9.7	10.0	10.5	10.2	10.1	10.2
Average YOP in Subspecialty	4.1	4.8	4.6	4.7	5.0	4.9	5.0	5.4	5.7	5.9	6.4	6.1	6.0	6.1
Residents in training	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Fellows	39	66	74	94	94	86	74	65	51	52	53	49	46	43

Trends

Population:

The number of fully trained duty internal medicine subspecialty physicians (IMSSPs) in the Navy increased during the first half of the decade, from 121 specialists in FY 1987 to 230 in FY 1993, but subsequently decreased to 155 specialists by FY 2000. In the civilian sector, the number of IMSSPs climbed from 30,678

specialists in 1988 to 42,505 in 1999—an approximate 39-percent increase.

Percent of All Duty Specialists:

IMSSPs accounted for 7 percent of all active duty Navy specialists in both FY 1987 and FY 2000, despite increasing to 11 percent between FY 1987 and FY 1993.

Age & Gender:

The average age of Navy IMSSPs increased from 37.6 years in FY 1987 to 41.3 years in FY 2000, with an average of 40 years during this time. IMSSPs in the civilian sector also appear to have gotten older over the last decade. While the percentage of civilian IMSSPs under age 35 and age 35 to 44 decreased from 1989 to 1999, the percentage of those age 45 to 54, 55 to 64, and age 65 and older all increased. During this time, the percentage of those under age 35 decreased from about 19 to 9 percent, while those 35 to 44 years fell from 41 to 33 percent. Civilian IMSSPs age 45 to 54 years increased from about 23 percent in 1989 to 33 percent in 1999, while those age 55 to 64 years rose from about 11 to 17 percent, and those over age 65 from 7 to 9 percent. Furthermore, most civilian IMSSPs were age 35 to 44 from 1989 to 1998, but age 45 to 54 by 1999. The percentage of female Navy IMSSPs increased over the last decade, from 6 percent in FY 1987 to 17 percent in FY 2000. The percentage of civilian female IMSSPs also rose slightly, from about 6 to 9 percent between 1988 and 1999.

Ethnicity:

The percentage of minority Navy IMSSPs increased from about 4 percent in FY 1987 to 9 percent in FY 2000. During this same time, the percentage of black Navy IMSSPs rose from 1 to 4 percent, while the percentage of Asian IMSSPs ranged from 0 to 3 percent. The percentage of those categorized as other race or ethnicity fluctuated between 2 and 3 percent over the decade.

Marital Status & Dependents:

The percentage of married Navy IMSSPs (not married to active duty (AD) individuals) decreased from 79 to 71 percent between FY 1987 and FY 2000, whereas the percentage of those married to AD increased from 7 to 11 percent. The percentage of single Navy IMSSPs increased slightly, from 14 percent in FY 1987 to 16 percent in FY 1999. From FY 1987 to FY 2000, the average number of dependents was 2 for married IMSSPs (not to AD), 1 for those married to AD, and 0 for single IMSSPs.

Years of Commissioned Service (YOCS), Years of Service (YOS) & Paygrade:

The average YOCS for Navy IMSSPs increased from 9.7 years in FY 1987 to 13.3 years in FY 2000, while the average YOS rose from 9.8 to 13.3 years. The percentage of IMSSPs who were O-3s ranged from only 0 to 3 percent between FY 1987 and FY 2000. Most IMSSPs were either O-4s (ranging from 35 to 48 percent) or O-5s (ranging from 29 to 44 percent) during this time. The percentage of O-6s increased throughout the decade, from about 20 to 29 percent between FY 1987 and FY 2000.

Board Certification, Experience & Training:

The percentage of board-certified Navy IMSSPs decreased from 36 percent in FY 1987 to 25 percent in FY 2000. The civilian sector, on the other hand, experienced an increase in the percentage of board-certified IMSSPs from about 80 to 87 percent between 1989 and 1999. The average years of practice (YOP) in primary specialty for duty Navy IMSSPs increased steadily from FY 1987 to FY 2000, from 7.4 to 10.2 years. The average YOP in subspecialty also increased from 4.1 to 6.1 years for Navy IMSSPs.

* FY 2000 marital status and dependents data for singles have been excluded because 17 percent of the data are missing and the values are inconsistent with those of previous years.

Neurology

	FY87	FY88	FY89	FY90	FY91	FY92	FY93	FY94	FY95	FY96	FY97	FY98	FY99	FY00
Duty physicians	25	32	32	29	22	23	24	28	31	30	31	31	31	31
Percent of all duty specialists	2%	2%	2%	2%	1%	1%	1%	1%	2%	2%	2%	2%	1%	1%
Average age (years)	38.2	37.6	38.8	39.6	40.2	41.0	41.6	41.6	41.9	41.5	42.0	42.5	42.8	43.4
Male physicians	68%	88%	84%	93%	86%	83%	83%	89%	87%	83%	87%	87%	90%	90%
Ethnicity														
White	68%	75%	75%	86%	91%	91%	88%	86%	90%	90%	94%	97%	94%	94%
Black	0%	0%	0%	0%	0%	4%	4%	0%	3%	3%	3%	0%	0%	0%
Asian	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Other	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Unknown	32%	25%	25%	14%	9%	4%	8%	14%	6%	7%	3%	3%	6%	6%
Marital status														
Married	52%	59%	63%	72%	77%	74%	75%	75%	68%	70%	68%	74%	74%	71%
Married to AD	8%	3%	0%	0%	5%	9%	13%	11%	13%	13%	10%	6%	3%	3%
Single	40%	38%	38%	28%	18%	17%	13%	14%	19%	17%	23%	19%	23%	*
Unknown	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	16%
Average no. of dependents														
If married	2	1	1	2	1	1	1	1	2	2	2	2	2	2
If married to AD	1	1			0	0	0	0	0	0	1	1	1	1
If single	0	0	0	0	0	0	0	0	0	0	0	0	0	*
Average YOCS	8.7	7.9	8.2	9.3	9.9	10.8	10.6	11.5	11.5	11.1	12.0	12.7	12.7	13.2
Average YOS	8.7	8.0	8.3	9.4	10.1	11.0	10.8	11.6	11.8	11.5	12.4	13.0	13.1	14.0
Paygrade														
Percent O-3	16%	28%	16%	0%	5%	9%	17%	11%	3%	10%	6%	10%	10%	3%
Percent O-4	32%	31%	38%	48%	41%	39%	29%	29%	39%	33%	35%	26%	29%	32%
Percent O-5	40%	31%	31%	31%	27%	26%	21%	32%	32%	33%	35%	42%	26%	32%
Percent O-6	12%	9%	16%	21%	27%	26%	33%	29%	26%	23%	23%	23%	35%	32%
Percent board certified	60%	34%	44%	55%	55%	61%	63%	50%	45%	50%	45%	48%	55%	55%
Average YOP in Specialty	7.0	5.8	7.1	7.4	7.7	8.2	8.9	8.8	8.5	8.1	8.4	8.7	9.2	9.3
Residents in training	6	8	7	9	13	12	12	9	8	6	8	5	4	4
Fellows	2	0	0	0	0	0	1	2	0	1	1	2	1	2

Trends

Population:

The number of fully trained duty neurologists (NRs) ranged from 22 to 32 specialists from FY 1987 to FY 2000. Since FY 1995, the Navy has had 30 to 31 NRs in each fiscal year. The civilian sector also experienced a rise in NRs, from 8,663 specialists in 1988 to 11,807 in 1999.

Percent of All Duty Specialists:

From FY 1987 to FY 2000, the percentage of NRs ranged from 1 to 2 percent of all active duty Navy specialists.

Age & Gender:

The average age of Navy NRs increased from 38.2 years in FY 1987 to 43.4 years in FY 2000, with an average of 40.9 years over this time period. NRs in the civilian sector also appear to have gotten older in the last decade. Though most civilian NRs were age 35 to 44 in the past several years, by 1999 more were age 45 to 54—this age category having risen from about 22 to 34 percent between 1989 and 1999. Furthermore, the percentage of civilian NRs age 55 to 64 rose from about 10 to 17 percent during this same time, while those age 65 and over increased from 4 to 8 percent. The percentage of female NRs in the Navy decreased between FY 1987 and FY 2000, from 32 to 10 percent. The percentage of civilian NRs, however, increased from about 15 percent in 1988 to 21 percent in 1989.

Ethnicity:

The data indicates only 0 to 4 percent of Navy NRs were minorities between FY 1987 and FY 2000. All minorities noted were black.

Marital Status & Dependents:

The percentage of married Navy NRs (not married to active duty (AD) individuals) increased from 52 percent in FY 1987 to 71 percent in FY 2000. The percentage of those married to AD decreased slightly from 8 to 3 percent throughout the decade, whereas the percentage of single Navy NRs dropped substantially from 40 to 23 percent. The average number of dependents for married Navy NRs (not to AD) was 1 in most years from FY 1987 to FY 1994, yet rose to 2 from FY 1995 to FY 2000. The average number of dependents for those married to AD was 0 from FY 1991 to FY 1996 and increased to 1 from FY 1997 to FY 2000. The average number of dependents for single Navy NRs was 0 throughout the decade.

Years of Commissioned Service (YOCS), Years of Service (YOS) & Paygrade:

The average YOCS for Navy NRs increased from 8.7 years in FY 1987 to 13.2 years in FY 2000, while the average YOS also rose from 8.7 to 14.0 years. Over the last decade, Navy neurological medicine became primarily, and almost equally, composed of O-4s, O-5s, and O-6s. From FY 1987 to FY 2000, the percentage of O-3 NRs dropped from 16 to 3 percent, while the percentage of O-6 NRs rose from 12 to 32 percent. Both O-4s and O-5s were also at 32 percent in FY 2000.

Board Certification, Experience & Training:

The percentage of board-certified NRs in the Navy decreased from 60 percent in FY 1987 to 55 percent in FY 2000, while those in the civilian sector increased from 63 to 70 percent between 1989 and 1999. The average years of practice (YOP) in specialty for duty Navy NRs increased from 7.0 years in FY 1987 to 9.3 years in FY 2000. The number of Navy NR residents doubled between FY 1987 and FY 1993, from 6 to 12 residents, yet subsequently decreased to only 4 residents by FY 2000. The Navy's number of NR fellows ranged from 0 to 2 between FY 1987 and FY 2000.

* FY 2000 marital status and dependents data for singles have been excluded because 16 percent of the data are missing and the values are inconsistent with those of previous years.

Neurological surgery

	FY87	FY88	FY89	FY90	FY91	FY92	FY93	FY94	FY95	FY96	FY97	FY98	FY99	FY00
Duty physicians	11	14	14	20	17	16	17	16	18	16	15	15	11	11
Percent of all duty specialists	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Average age (years)	37.8	37.8	38.1	37.0	38.0	38.9	37.6	36.8	37.6	38.7	40.3	41.1	43.0	41.6
Male physicians	91%	93%	93%	95%	94%	94%	100%	100%	94%	94%	93%	93%	91%	82%
Ethnicity														
White	82%	79%	93%	75%	76%	81%	82%	94%	100%	100%	93%	93%	91%	91%
Black	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	7%	7%	9%	9%
Asian	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Other	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Unknown	18%	21%	7%	25%	24%	19%	18%	6%	0%	0%	0%	0%	0%	0%
Marital status														
Married	64%	71%	86%	70%	82%	88%	88%	88%	78%	75%	87%	73%	73%	82%
Married to AD	0%	0%	0%	0%	0%	0%	0%	0%	6%	6%	7%	7%	9%	9%
Single	27%	21%	14%	25%	18%	13%	12%	13%	17%	19%	7%	13%	9%	0*
Unknown	9%	7%	0%	5%	0%	0%	0%	0%	0%	0%	0%	7%	9%	9%
Average no. of dependents														
If married	2	2	2	2	2	2	1	1	2	2	2	3	3	2
If married to AD									0	0	0	0	0	0
If single	0	0	1	0	0	0	0	0	0	0	0	0	0	0
Average YOCs	6.2	6.2	6.3	5.1	5.6	6.0	6.7	7.2	7.3	8.1	9.6	11.1	13.4	12.0
Average YOS	6.0	6.2	6.3	5.1	5.6	6.0	6.8	7.3	7.6	8.4	10.5	12.0	14.6	13.3
Paygrade														
Percent O-3	0%	7%	0%	0%	0%	0%	6%	13%	6%	6%	0%	0%	0%	0%
Percent O-4	73%	50%	57%	65%	65%	63%	59%	56%	67%	56%	67%	40%	36%	45%
Percent O-5	9%	29%	29%	30%	29%	25%	24%	19%	17%	19%	20%	47%	45%	45%
Percent O-6	18%	14%	14%	5%	6%	13%	12%	13%	11%	19%	13%	13%	18%	9%
Percent board certified	64%	43%	43%	30%	29%	25%	35%	19%	11%	13%	20%	20%	9%	9%
Average YOP in Specialty	5.5	4.7	5.6	3.7	4.6	5.2	3.6	2.8	3.3	4.0	3.9	4.5	6.4	5.4
Residents in training	9	9	10	7	10	10	9	8	8	10	5	3	6	7
Fellows	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Trends

Population:

Though the Navy had 11 fully trained duty neurological surgeons (NSs) in FY 1987 and FY 2000, the average number of specialists across these years was about 15. The civilian sector witnessed a modest rise in NSs throughout the last decade, from 4,217 specialists in 1988 to 4,904 in 1999—an approximate 16-percent increase.

Percent of All Duty Specialists:

From FY 1987 to FY 2000, NSs accounted for 1 percent of all active duty Navy specialists.

Age & Gender:

The average age of Navy NSs increased from 37.8 years in FY 1987 to 41.6 years in FY 2000, with an average of 38.9 years during this time period. Civilian NSs also appear to have gotten older over the past decade. While the percentage of civilian NSs under age 35 decreased from about 21 to 16 percent between 1989 and 1999, the percentage of those 55 to 64 years increased from about 16 to 22 percent, and those 65 years and over increased from about 8 to 14 percent. The percentage of civilian NSs age 45 to 54 dropped by 3 percentage points, from about 27 to 24 percent between 1989 and 1999. The percentage of female Navy NSs increased from 9 percent in FY 1987 to 18 percent by FY 2000, although there were no females NSs in the Navy in FY 1993 and FY 1994. The percentage of civilian NSs rose slightly over the decade, from about 3 to 5 percent between 1988 and 1999.

Ethnicity:

Though the Navy had no minority NSs until FY 1997, about 9 percent of these Navy specialists were minorities (black) by FY 2000.

Marital Status & Dependents:

The percentage of married Navy NSs (not married to active duty (AD) individuals) increased from 64 percent in FY 1987 to 82 percent in FY 2000. The percentage of those married to AD was 0 throughout much of the decade, but ranged from 6 to 9 percent between FY 1995 and FY 2000. The percentage of single Navy NSs decreased from 27 to 9 percent between FY 1987 and FY 1999. From FY 1987 to FY 2000, the average number of dependents was 2 for married Navy NSs (not to AD), and 0 for those who were single.

Years of Commissioned Service (YOCs), Years of Service (YOS) & Paygrade:

The average YOCs and average YOS for Navy NSs both doubled over the past decade. While the average YOCs for these specialists rose from 6.2 to 12.0 years, the average YOS increased from 6.0 to 13.3 years during this time. In FY 2000, over 90 percent of Navy NSs were either O-4s or O-5s, while the remaining percentage were O-6s. From FY 1987 to FY 2000, the percentage of O-5 NSs increased considerably, from about 9 to 45.5 percent, while the percentage of O-4s and O-6s both decreased.

Board Certification, Experience & Training:

The percentage of board-certified NSs in the Navy decreased consistently from about 64 percent in FY 1987 to only 9 percent in FY 2000. The civilian sector, however, experienced an increase the percentage of board-certified NSs, from about 61 percent in 1989 to 67 percent in 1999. The average years of practice (YOP) in specialty for duty Navy NSs ranged from 2.8 to 6.4 years between FY 1987 and FY 2000, with an average of 4.5 years. The number of Navy NS residents ranged from 3 to 10 residents, with an average of about 8 residents from FY 1987 to FY 2000.

* Variation may be due to missing 9 percent of data for marital status and dependents in FY 2000.

Nuclear medicine

	FY87	FY88	FY89	FY90	FY91	FY92	FY93	FY94	FY95	FY96	FY97	FY98	FY99	FY00
Duty physicians	11	10	11	11	11	9	10	10	10	10	11	11	10	8
Percent of all duty specialists	1%	1%	1%	1%	1%	0%	0%	0%	1%	1%	1%	1%	0%	0%
Average age (years)	40.8	41.3	41.5	42.5	41.9	41.4	42.1	43.1	43.3	44.3	44.7	45.7	46.1	48.0
Male physicians	100%	100%	100%	100%	91%	89%	90%	90%	90%	90%	91%	91%	90%	88%
Ethnicity														
White	91%	90%	82%	82%	82%	78%	80%	80%	90%	90%	91%	91%	100%	100%
Black	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Asian	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Other	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Unknown	9%	10%	18%	18%	18%	22%	20%	20%	10%	10%	9%	9%	0%	0%
Marital Status														
Married	73%	70%	64%	64%	64%	56%	60%	60%	70%	70%	64%	64%	60%	75%
Married to AD	9%	10%	0%	0%	0%	11%	10%	10%	10%	10%	18%	18%	20%	*
Single	18%	20%	27%	36%	36%	33%	30%	30%	20%	20%	18%	18%	20%	*
Unknown	0%	0%	9%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	25%
Average no. of dependents														
If married	1	1	1	1	1	1	1	1	1	1	1	1	1	1
If married to AD	3	3				1	1	1	1	1	1	1	1	1
If single	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Average YOCS	12.9	12.5	13.2	12.2	12.3	11.4	12.3	13.3	14.9	15.9	16.5	17.5	18.5	19.6
Average YOS	12.9	12.5	13.2	12.5	12.5	11.8	12.6	13.6	15.2	16.2	16.7	17.7	18.5	19.6
Paygrade														
Percent O-3	0%	0%	9%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Percent O-4	18%	20%	27%	36%	27%	22%	10%	10%	0%	0%	0%	0%	0%	0%
Percent O-5	36%	40%	27%	27%	36%	56%	70%	70%	80%	80%	73%	55%	40%	38%
Percent O-6	45%	40%	36%	36%	36%	22%	20%	20%	20%	20%	27%	45%	60%	63%
Percent board certified														
Average number of years in specialty	9.5	10.0	11.0	12.4	11.5	11.0	11.4	12.4	11.8	12.8	12.9	13.9	14.7	17.3
Residents in training	1	1	1	2	2	1	1	2	1	1	0	0	0	0
Average YOP in Specialty	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Trends														

Population:

The number of fully trained duty nuclear medicine (NM) physicians in the Navy ranged from 8 to 11 specialists between FY 1987 and FY 2000, with an average of about 10 specialists during this time period. In the civilian sector, the number of NM physicians increased over the past decade, from 1,334 to 1,446 specialists between 1988 and 1989—an approximate 8 percent increase.

Percent of All Duty Specialists:

From FY 1987 to FY 2000, the percentage of NM physicians ranged from 0 to 1 percent of all active duty Navy specialists.

Age & Gender:

The average age of Navy NM physicians increased from 40.8 years in FY 1987 to 48.0 years in FY 2000. The average age of these specialists during this time was 43.3 years. Civilian NM physicians also appear to have gotten older in the past several years. The percentage of these specialists under age 35 decreased from about 12 to 8 percent between 1989 and 1999, while the percentage of those 35 to 44 years also fell from about 33 to 21 percent. On the other hand, the percentage of civilian NM physicians in age groups 45 to 54 years, 55 to 64 years and 65 years and older all increased. The largest percentage increase was among those age 65 and older, from 6 to 15 percent between 1989 and 1999. The percentage of female NM physicians in the Navy increased from 0 to 12 percent between FY 1987 and FY 2000, while those in the civilian sector increased from about 12 to 18 percent between 1989 and 1999.

Ethnicity:

All Navy NM physicians were Caucasian from FY 1987 to FY 2000.

Marital Status & Dependents:

The percentage of married Navy NM physicians decreased from 73 percent in FY 2000 to 60 percent in FY 1993, yet increased to 75 percent by FY 2000. The percentage of those married to AD increased steadily throughout the decade, from 9 percent in FY 1987 to 20 percent in FY 1999. The percentage of single NM physicians jumped from 18 to 36 percent between FY 1987 and FY 1990, yet decreased to 20 percent by FY 1999. The average number of dependents for married Navy NM physicians (not to AD) was 1 from FY 1987 to FY 2000. The average number of dependents for single Navy NM physicians was 0 from FY 1987 to FY 1999.

Years of Commissioned Service (YOCs), Years of Service (YOS) & Paygrade:

Both the average YOCs and average YOS increased from 12.9 years in FY 1987 to 19.6 years in FY 2000. Most Navy NM physicians were either O-5s or O-6s throughout the last decade. There were no O-3 NM physicians in either FY 1987 or FY 2000, though these specialists reached a high of 13 percent of O-3s in FY 1994. From FY 1987 to FY 1994, the percentage of O-4 NM physicians dropped from about 18 to 10 percent, and remained at 0 through FY 2000. The percentage of O-5s increased slightly between FY 1987 and FY 2000, from 36 to 38 percent, while the percentage of O-6s rose from 45 to 63 percent during this time.

Board Certification, Experience & Training:

The percentage of board certified Navy NM physicians increased from 82 percent in FY 1987 to 88 percent in FY 2000, despite a decrease during the first half of the decade. The percentage of civilian board certified NMs changed little, remaining at 84 percent in both 1989 and 1999. The average years of practice (YOP) in specialty for duty Navy NM physicians increased considerably from 9.5 years in FY 1987 to 17.3 years in FY 2000. The number of Navy NM residents ranged from 0 to 2 residents during this same time period, yet remained at 0 from FY 1997 to FY 2000.

*FY 2000 marital status data for singles and those married to AD have been excluded because 20 percent of the data are missing and the values are inconsistent with those of previous years.

Obstetrics/gynecology

	FY87	FY88	FY89	FY90	FY91	FY92	FY93	FY94	FY95	FY96	FY97	FY98	FY99	FY00
Duty physicians	106	106	97	101	97	96	109	116	110	115	125	128	136	138
Percent of all duty specialists	6%	6%	5%	5%	5%	5%	5%	6%	6%	6%	6%	6%	6%	6%
Average age (years)	36.6	37.1	37.5	37.6	38.0	38.0	37.4	38.0	38.6	39.0	38.8	38.1	37.6	37.4
Male physicians	80%	79%	87%	84%	86%	89%	83%	81%	75%	70%	67%	62%	62%	59%
Ethnicity														
White	62%	78%	85%	83%	75%	77%	79%	83%	86%	86%	88%	79%	73%	69%
Black	2%	3%	3%	4%	5%	3%	4%	4%	7%	7%	6%	5%	4%	6%
Asian	1%	1%	2%	2%	2%	3%	2%	2%	3%	3%	4%	3%	4%	6%
Other	2%	2%	2%	2%	2%	3%	3%	3%	3%	2%	1%	2%	2%	2%
Unknown	33%	16%	8%	9%	15%	14%	13%	9%	1%	2%	2%	10%	18%	17%
Marital status														
Married	76%	75%	82%	79%	78%	79%	78%	78%	74%	71%	71%	60%	63%	63%
Married to AD	10%	10%	6%	7%	3%	6%	9%	9%	9%	12%	9%	12%	11%	7%
Single	12%	13%	11%	14%	18%	14%	13%	11%	17%	16%	20%	19%	15%	*
Unknown	1%	2%	0%	0%	1%	1%	0%	3%	0%	1%	0%	9%	11%	28%
Average no. of dependents														
If married	2	2	2	2	2	2	2	2	1	2	2	2	1	2
If married to AD	0	0	1	1	0	1	1	1	1	1	1	1	1	1
If single	0	0	0	0	0	0	0	1	1	0	0	0	0	*
Average YOCS	8.4	8.6	8.7	8.2	8.4	8.4	7.8	7.7	7.8	8.0	7.2	6.9	6.8	7.1
Average YOS	8.6	8.8	9.0	8.6	8.7	8.7	8.0	7.9	8.0	8.2	7.4	7.0	6.9	7.4
Paygrade														
Percent O-3	22%	17%	10%	13%	19%	20%	28%	26%	26%	21%	31%	38%	32%	28%
Percent O-4	44%	50%	59%	62%	54%	55%	52%	49%	45%	49%	40%	36%	48%	54%
Percent O-5	21%	19%	18%	12%	15%	14%	12%	16%	17%	20%	19%	17%	11%	12%
Percent O-6	13%	14%	13%	13%	12%	11%	8%	9%	12%	10%	10%	9%	10%	6%
Percent board certified	29%	28%	29%	32%	34%	26%	20%	28%	30%	35%	36%	29%	28%	31%
Average YOP in Specialty	5.1	5.2	5.4	5.5	5.7	5.9	5.0	6.0	6.5	6.6	6.5	5.7	5.2	4.7
Residents in training	59	58	57	59	60	59	48	43	41	39	40	43	42	30
Fellows	5	5	9	16	16	10	7	7	7	6	8	8	9	5

Trends

Population:

The number of fully trained duty Obstetricians/Gynecologists (OB/GYNs) in the Navy increased by about 30 percent over the last decade, from 106 specialists in FY 1987 to 138 in FY 2000. In the civilian sector, the number of OB/GYNs rose by about 22 percent, from 32,278 specialists in 1988 to 39,363 in 1999.

Percent of All Duty Specialists:

In most years from FY 1987 to FY 2000, OB/GYNs accounted for about 6 percent of all active duty Navy specialists. However, from FY 1989 to FY 1993 they accounted for 5 percent.

Age & Gender:

The average age of Navy OB/GYNs increased slightly, from 36.6 years in FY 1987 to 37.4 years in FY 2000, with an overall average of 37.8 years. From 1989 to 1998, the most common age group for civilian OB/GYNs was 35 to 44 years (at about 30 percent). In 1999, however, slightly more civilian OB/GYNs were age 45 to 54 years—the percentage in this group having risen from 22 percent in 1989 to 27 percent by 1999. The percentage of civilian OB/GYNs under age 35 decreased from about 23 to 17 percent during this time, while the percentage of those 65 years and over increased from about 9 to 12 percent. The percentage of female Navy OB/GYNs increased over the last decade, from 20 percent in FY 1987 to 41 percent by FY 2000. The civilian sector also experienced an increase in the percentage of female OB/GYNs, from about 21 to 33 percent from 1989 to 1999.

Ethnicity:

The percentage of minority Navy OB/GYNs increased over the past several years, from 7 percent in FY 1987 to 17 percent in FY 2000. Particularly, the percentage of black Navy OB/GYNs rose from 3 to 7 percent, and Asian Navy OB/GYNs from 1 to 7 percent during this time. The percentage of those categorized as other race or ethnicity was at 3 percent in both FY 1987 and FY 2000.

Marital Status & Dependents:

The percentage of married Navy OB/GYNs (not married to active duty (AD) individuals) decreased from 76 percent in FY 1987 to 63 percent in FY 2000. The percentage of those married to AD ranged from 3 to 12 percent throughout the decade, whereas the percentage of single Navy OB/GYNs ranged from 11 to 20 percent. From FY 1987 to FY 2000, the average number of dependents was 2 for married Navy OB/GYNs (not to AD), 1 for those married to AD, and 0 for single specialists.

Years of Commissioned Service (YOCs), Years of Service (YOS) & Paygrade:

From FY 1987 to FY 2000, the average YOCs fell from 8.4 to 7.1 years, and the average YOS from 8.6 to 7.4 years. The percentage of O-3 and O-4 Navy OB/GYNs increased over the last decade, while the percentage of O-5s and O-6s decreased. O-4s made up more than half of Navy OB/GYNs by FY 2000, having risen from 44 percent in FY 1987 to 54 percent in FY 2000.

Board Certification, Experience & Training:

The percentage of board-certified Navy OB/GYNs ranged from 20 to 36 percent between FY 1987 and FY 2000, with an average of about 30 percent. The civilian sector had a much higher percentage of board-certified OB/GYNs that increased over the last decade, from 61 percent in 1989 and 70 percent in 1999. The average years of practice (YOP) in specialty for duty Navy OB/GYNs increased from 5.1 years in FY 1987 to 6.6 years in FY 1996, and subsequently decreased to 4.7 years by FY 2000. The number of Navy OB/GYN residents decreased from 59 to 30 residents during this same time period. The number of Navy OB/GYN fellows was 5 in both FY 1987 and FY 2000, despite having reached a high of 16 fellows in FY 1990 and FY 1991.

* FY 2000 marital status and dependents data for singles have been excluded because 28 percent of the data are missing and the values are inconsistent with those of previous years.

Ophthalmology

	FY87	FY88	FY89	FY90	FY91	FY92	FY93	FY94	FY95	FY96	FY97	FY98	FY99	FY00
Duty physicians	51	52	57	61	54	55	56	56	61	64	68	72	68	64
Percent of all duty specialists	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Average age (years)	39.0	38.4	38.7	39.2	40.1	40.4	40.7	40.6	40.4	41.6	40.8	41.9	41.7	42.2
Male physicians	94%	94%	95%	93%	94%	96%	98%	96%	93%	91%	91%	93%	91%	88%
Ethnicity														
White	86%	88%	89%	89%	89%	93%	96%	96%	97%	98%	97%	96%	96%	97%
Black	0%	2%	2%	2%	2%	2%	2%	2%	2%	2%	1%	1%	1%	0%
Asian	0%	0%	2%	2%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Other	4%	2%	2%	2%	0%	0%	0%	0%	0%	0%	1%	1%	1%	2%
Unknown	10%	8%	5%	7%	9%	5%	2%	2%	2%	0%	0%	1%	1%	2%
Marital status														
Married	73%	77%	75%	79%	78%	80%	80%	82%	77%	78%	81%	74%	76%	75%
Married to AD	6%	6%	11%	5%	7%	5%	5%	5%	10%	8%	6%	7%	6%	6%
Single	22%	17%	14%	15%	15%	15%	14%	13%	13%	14%	13%	19%	18%	*
Unknown	0%	0%	0%	2%	0%	0%	0%	0%	0%	0%	0%	0%	0%	14%
Average no. of dependents														
If married	2	2	2	1	2	2	2	2	2	2	2	2	2	2
If married to AD	1	1	1	1	2	2	3	3	1	1	1	1	1	1
If single	1	1	1	0	1	0	0	0	0	0	0	1	1	*
Average YOCS	10.9	10.4	10.3	9.8	10.7	11.3	12.0	11.9	11.7	12.7	11.9	13.2	13.3	14.4
Average YOS	11.1	10.6	10.3	9.9	10.7	11.5	12.3	12.1	12.0	12.8	12.2	13.5	13.5	14.5
Paygrade														
Percent O-3	4%	0%	4%	13%	4%	4%	4%	0%	0%	2%	1%	1%	0%	0%
Percent O-4	49%	60%	53%	38%	43%	45%	46%	41%	46%	34%	40%	32%	34%	28%
Percent O-5	24%	21%	26%	31%	35%	29%	32%	41%	39%	42%	40%	46%	49%	42%
Percent O-6	24%	19%	18%	18%	19%	22%	18%	18%	15%	22%	19%	21%	18%	30%
Percent board certified	57%	46%	42%	39%	41%	44%	38%	43%	43%	45%	43%	51%	53%	56%
Average YOP in Specialty	5.5	5.1	5.3	5.7	6.3	6.0	5.8	5.6	5.5	6.4	5.8	6.7	6.5	7.1
Residents in training	23	22	22	25	26	26	25	24	22	19	13	10	9	9
Fellows	4	2	3	2	3	6	1	3	3	4	2	2	1	1

Trends

Population:

The number of fully trained duty ophthalmologists (OPs) in the Navy increased from 51 to 64 specialists between FY 1987 and FY 2000, though the number decreased in both FY 1999 and FY 2000. The number of civilian OPs also increased over the last decade, from 15,581 specialists in 1988 to 17,753 in 1999, yet decreased by about 2 percent between 1998 and 1999.

Percent of All Duty Specialists:

From FY 1987 to FY 2000, OPs accounted for 3 percent of all active duty Navy specialists.

Age & Gender:

The average age of Navy OPs rose from 39 years in FY 1987 to 42.2 years in FY 2000, with an average of 40.4 years during this time. The most common age group for civilian OPs was 35 to 44 years from 1989 to 1999 (ranging from about 28 to 31 percent), while the second most common age group was 45 to 54 years (ranging from 25 to 27 percent). The percentage of civilian OPs under age 35 decreased from about 21 to 11 percent between 1989 and 1999, while the percentage of those age 55 to 64 years increased from about 14 to 22 percent. The percentage of civilian OPs age 65 years and older rose slightly, from about 10 percent in 1989 to 13 percent in 1999. The Navy had an increase in the percentage of female OPs over the last decade, from 6 percent in FY 1987 to 12 percent in FY 2000. The civilian sector also witnessed an increase in female OPs, from about 9 to 14 percent between 1988 and 1999.

Ethnicity:

The percentage of minority Navy OPs decreased from 4 to 2 percent between FY 1987 and FY 2000. In FY 2000, 98 percent of OPs were Caucasian and 2 percent were categorized as other race or ethnicity.

Marital Status & Dependents:

The composition of Navy OPs by marital status varied little throughout the decade. The percentage of married Navy OPs (not married to active duty (AD) individuals) ranged from 73 to 82 percent between FY 1987 and FY 2000, whereas the percentage of those married to AD ranged from 5 to 11 percent. The percentage of single Navy OPs ranged from 13 to 22 percent during this time. From FY 1987 to FY 2000, the average number of dependents was 2 for married Navy OPs (not married to AD). The average number of dependents ranged from 1 to 3 for those married to AD, and from 0 to 1 for single Navy OPs.

Years of Commissioned Service (YOCS), Years of Service (YOS) & Paygrade:

The average YOCS and average YOS for Navy OPs both increased over the last decade. The average YOCS rose from 10.9 to 14.4 years between FY 1987 and FY 2000, while the average YOS increased from 11.1 to 14.5 years. The percentage of O-4 Navy OPs decreased considerably, from 49 percent in FY 1987 to 28 percent in FY 2000, while the percentage of O-5s increased from 24 to 42 percent. The percentage of O-6 Navy OPs also increased, from 24 percent in FY 1987 to 30 percent in FY 2000. The percentage of O-3s fell from 4 to 0 percent during this time.

Board Certification, Experience & Training:

The percentage of board-certified Navy OPs decreased in the first half of the decade, from 57 percent in FY 1987 to 38 percent in FY 1993, yet subsequently increased to 56 percent by FY 2000. The civilian sector, on the other hand, witnessed an overall increase in the percentage of board-certified OPs, from about 74 to 81 percent between 1989 and 1999. The average years of practice (YOP) in specialty for duty Navy OPs increased from 5.5 years in FY 1987 to 7.1 years in FY 2000. During this same time, the number of Navy OP residents fell from 23 to 9 residents. The number of Navy OP fellows has varied greatly, ranging from 1 to 6 fellows from FY 1987 to FY 2000, with a median of 2.5 fellows.

* FY 2000 marital status and dependents data for singles have been excluded because 14 percent of the data are missing and the values are inconsistent with those of previous years.

Orthopedic surgery

	FY87	FY88	FY89	FY90	FY91	FY92	FY93	FY94	FY95	FY96	FY97	FY98	FY99	FY00
Duty physicians	96	95	100	98	114	112	115	102	103	102	102	104	109	109
Percent of all duty specialists	6%	6%	6%	5%	6%	6%	6%	5%	5%	5%	5%	5%	5%	5%
Average age (years)	36.5	37.1	37.1	37.6	37.9	38.8	38.8	38.6	39.3	40.3	39.7	39.6	39.0	38.9
Male physicians	95%	96%	97%	96%	96%	96%	97%	99%	96%	95%	95%	93%	93%	94%
Ethnicity														
White	63%	75%	86%	86%	80%	81%	81%	84%	94%	96%	91%	85%	68%	67%
Black	1%	1%	1%	1%	1%	0%	0%	0%	0%	0%	0%	1%	2%	2%
Asian	0%	0%	0%	0%	0%	1%	1%	1%	1%	1%	1%	0%	3%	3%
Other	2%	2%	2%	2%	2%	2%	2%	2%	1%	1%	2%	1%	2%	1%
Unknown	34%	22%	11%	11%	18%	16%	17%	13%	4%	2%	6%	13%	26%	28%
Marital status														
Married	79%	81%	74%	79%	83%	80%	85%	87%	82%	81%	84%	81%	76%	70%
Married to AD	5%	8%	11%	9%	7%	8%	5%	6%	7%	6%	3%	4%	6%	4%
Single	16%	11%	15%	12%	9%	12%	10%	7%	12%	13%	11%	8%	6%	*
Unknown	0%	0%	0%	0%	1%	0%	0%	0%	0%	0%	2%	8%	13%	27%
Average no. of dependents														
If married	2	2	2	2	2	2	2	2	2	2	2	2	2	2
If married to AD	0	0	1	1	1	2	1	2	1	1	1	1	1	1
If single	0	0	0	1	0	0	0	0	0	0	0	0	0	*
Average YOCs	8.2	8.2	7.2	7.0	7.3	7.9	8.1	8.8	9.3	10.1	10.4	9.9	9.6	9.1
Average YOS	8.2	8.4	7.4	7.2	7.6	8.2	8.3	8.9	9.4	10.4	10.5	10.0	9.8	9.3
Paygrade														
Percent O-3	8%	5%	12%	4%	6%	5%	6%	3%	1%	0%	4%	9%	9%	10%
Percent O-4	58%	59%	55%	66%	64%	62%	60%	58%	61%	60%	57%	52%	58%	59%
Percent O-5	19%	21%	19%	15%	17%	19%	19%	21%	17%	20%	21%	23%	19%	19%
Percent O-6	15%	14%	14%	14%	13%	14%	15%	19%	20%	21%	19%	16%	14%	12%
Percent board certified	29%	26%	28%	28%	35%	32%	30%	25%	29%	31%	35%	31%	28%	31%
Average YOP in Specialty	3.9	4.4	4.3	4.7	5.0	5.6	5.5	4.9	5.3	5.7	5.0	4.6	4.1	4.1
Residents in training	55	55	57	60	62	64	61	61	56	51	47	44	44	45
Fellows	0	2	0	2	3	2	3	2	4	1	5	3	3	4
Trends														

Population:

The number of fully trained duty orthopedic surgeons (OSs) in the Navy increased from 96 specialists in FY 1987 to 109 in FY 2000—an approximate 14-percent increase. The number of civilian OSs rose by about 18 percent over the last decade, from 18,741 to 21,553 specialists between 1988 and 1999.

Percent of All Duty Specialists:

From FY 1987 to FY 2000, the percentage of OSs decreased from 6 to 5 percent of all active duty Navy specialists.

Age & Gender:

The average age of Navy OSs increased from 36.5 to 38.9 years between FY 1987 and FY 2000, with an overall average of 38.5 years. From 1989 to 1999, the most common age group for civilian OSs was 35 to 44 years, though it decreased slightly from about 30 to 27 percent of civilian OSs. The percentage of those age 35 and under fell from about 24 percent in 1989 to 15 percent in 1999, while civilian OSs age 55 to 64 increased from 14 to 21 percent. Furthermore, those age 65 and over rose from about 7 to 11 percent from 1989 to 1999. From FY 1987 to FY 2000, the Navy had an average of about 3 percent female Navy OSs. In the civilian sector, the percentage of female OSs ranged from 2 to 3 percent between 1988 and 1999.

Ethnicity:

In most years from FY 1987 to FY 2000, the Navy had between 2 and 3 percent minority OSs. However, in FY 1999 and FY 2000, 8 percent of Navy OSs were minorities—2 to 3 percent black, 4 percent Asian, and 1 to 2 percent of other race or ethnicity.

Marital Status & Dependents:

The percentage of married Navy OSs (not married to active duty (AD) individuals) decreased slightly from 79 percent in FY 1987 to 76 percent in FY 1999, after reaching a high of 87 percent in FY 1994. The percentage of those married to AD ranged from 3 to 11 percent throughout the decade, whereas the percentage of single Navy OSs 6 to 16 percent. From FY 1987 to FY 2000, the average number of dependents was 2 for married Navy OSs (not married to AD), 1 for those married to AD, and 0 for single Navy OSs.

Years of Commissioned Service (YOCs), Years of Service (YOS) & Paygrade:

Both the average YOCs and average YOS for Navy OSs increased from 8.2 years in FY 1987 to about 9.2 years in FY 2000. During the same time period, the composition of Navy OSs by paygrade remained somewhat consistent. Most Navy OSs were O-4s from FY 1987 to FY 2000, fluctuating around 60 percent in most years, while the smallest percentage were O-3s (10 percent or lower). The percentage of O-5 OSs fluctuated between 15 and 23 percent from FY 1987 and FY 2000, whereas the percentage of O-6s ranged from a low of 12 percent in FY 2000 to a high of 21 percent in FY 1996.

Board Certification, Experience & Training:

The percentage of board-certified Navy OSs ranged from 25 to 35 percent between FY 1987 and FY 2000, with an average of about 30 percent. The percentage of board-certified civilian OSs, however, ranged from a low of about 67 percent in 1989 to a high of 74 percent in 1999. The average years of practice (YOP) in specialty for duty Navy OSs ranged from 3.9 to 5.6 years between FY 1987 and FY 2000, with an overall average of 4.8 years. The number of Navy OS residents increased from 55 in FY 1987 to 64 in FY 1992, and subsequently decreased to 45 by FY 2000. The number of Navy OS fellows ranged from 0 to 5 from FY 1987 to FY 2000, and was generally higher in the latter half of the decade than in the first half.

* FY 2000 marital status and dependents data for singles have been excluded because 27 percent of the data are missing and the values are inconsistent with those of previous years.

Otolaryngology

	FY87	FY88	FY89	FY90	FY91	FY92	FY93	FY94	FY95	FY96	FY97	FY98	FY99	FY00
Duty physicians	45	46	55	53	53	52	58	60	61	58	63	58	55	47
Percent of all duty specialists	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	2%
Average age (years)	38.2	39.0	39.7	40.1	40.4	39.6	39.0	39.9	39.3	39.8	40.0	40.6	40.7	41.5
Male physicians	93%	98%	98%	98%	96%	96%	98%	95%	97%	97%	95%	95%	93%	96%
Ethnicity														
White	87%	89%	93%	92%	89%	88%	88%	85%	95%	93%	90%	88%	87%	89%
Black	2%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	2%	2%	2%
Asian	2%	2%	2%	2%	2%	2%	2%	5%	3%	5%	6%	7%	7%	6%
Other	0%	2%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Unknown	9%	7%	5%	6%	9%	10%	10%	10%	2%	2%	3%	3%	4%	2%
Marital status														
Married	84%	89%	82%	77%	81%	81%	84%	85%	84%	84%	81%	83%	78%	81%
Married to AD	4%	4%	2%	4%	6%	8%	5%	5%	7%	5%	6%	7%	9%	9%
Single	11%	7%	16%	17%	13%	12%	10%	10%	10%	10%	13%	10%	13%	2%*
Unknown	0%	0%	0%	2%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Average no. of dependents														
If married	2	2	1	1	1	1	2	2	1	1	2	2	2	2
If married to AD	0	1	3	2	1	1	1	1	1	2	1	2	1	1
If single	0	0	1	0	1	1	1	1	0	0	0	0	0	1*
Average YOCS	10.3	11.2	11.2	11.1	10.9	10.4	9.5	10.3	10.6	11.4	11.9	12.6	12.7	13.4
Average YOS	10.5	11.5	11.5	11.3	11.0	10.4	9.6	10.4	10.7	11.5	12.0	12.8	12.8	13.6
Paygrade														
Percent O-3	0%	2%	0%	2%	4%	4%	2%	2%	0%	0%	2%	0%	0%	0%
Percent O-4	53%	48%	56%	53%	51%	54%	60%	58%	62%	57%	49%	40%	42%	32%
Percent O-5	24%	22%	20%	23%	19%	21%	26%	27%	26%	29%	37%	47%	44%	49%
Percent O-6	22%	28%	24%	23%	26%	21%	12%	13%	11%	14%	13%	14%	15%	19%
Percent board certified	73%	67%	75%	85%	68%	69%	62%	63%	61%	62%	67%	62%	58%	70%
Average YOP in Specialty	4.7	6.0	6.7	7.0	7.2	6.7	5.5	5.8	5.1	5.3	5.5	6.0	6.1	7.0
Residents in training	35	38	40	45	46	46	43	32	33	30	26	24	23	25
Fellows	2	1	1	1	1	0	2	7	1	3	3	2	1	3

Trends

Population:

The number of fully trained duty otolaryngologists (OTs) increased from 45 to 61 between FY 1987 and FY 1995, but subsequently decreased to 47 specialists by FY 2000. The number of civilian OTs increased over the last decade, from 7,812 specialists in 1988 to 9,041 in 1999—a rise of approximately 16 percent. Between 1998 and 1999, however, the civilian sector experienced a 2-percent decrease in OTs.

Percent of All Duty Specialists:

Although OTs accounted for 3 percent of all active duty Navy specialists from FY 1987 to FY 1999, they accounted for only 2 percent in FY 2000.

Age & Gender:

The average age of Navy OTs increased from 38.2 years in FY 1987 to 41.5 years in FY 2000, with an overall average of 39.8 years. The civilian sector also appears to have experienced an increase in the age of OTs during the last decade. From 1989 to 1999, the two most common age groups for civilian OTs were 35 to 44 years (ranging from 26 to 29 percent) and 45 to 54 years (ranging from 24 to 28 percent). While these age groups remained steady, the percentage of civilian OTs under age 35 decreased from about 21 to 16 percent, and those age 55 to 64 years increased from about 13 to 22 percent. The percentage of civilian OTs age 65 and over also rose from 9 percent in 1989 to 11 percent in 1999. The percentage of female Navy OTs varied throughout the decade, ranging from 2 to 7 percent between FY 1987 and FY 2000. The civilian sector, however, experienced a steady increase in the percentage of female OTs, from about 5 to 8 percent between 1988 and 1999.

Ethnicity:

The percentage of minority Navy OTs increased over the past decade, from about 4 percent in FY 1987 to 9 percent in FY 2000. Neither black nor other race/ethnicity OTs made up more than 2 percent of the specialty during this time. The percentage of Asian OTs increased from 2 to 7 percent between FY 1987 and FY 2000.

Marital Status & Dependents:

The percentage of married Navy OTs (not married to active duty (AD) individuals) decreased from 84 percent in FY 1987 to 81 percent in FY 2000, whereas the percentage of those married to AD increased from 4 to 9 percent. Excluding FY 2000, the percentage of single Navy OTs ranged from 10 to 17 percent throughout the decade. The average number of dependents for married Navy OTs (not to AD) fluctuated between 1 and 2 from FY 1987 to FY 2000, while the number for those married to AD ranged from 0 to 3. The average number of dependents for single Navy OTs varied between 0 and 1 over the last decade.

Years of Commissioned Service (YOCs), Years of Service (YOS) & Paygrade:

The average YOCs and average YOS for Navy OTs both experienced an approximate 3-year increase from FY 1987 to FY 2000. The average YOCs rose from 10.3 to 13.4 years during this time, while the average YOS increased from 10.5 to 13.6 years. In FY 1987, more than half of Navy OTs were O-4s (53 percent). Since then, the percentage of O-4s decreased to 32 percent in FY 2000, while the percentage of O-5s rose from 24 to 49 percent during the same time period. The percentage of O-3 OTs did not exceed 4 percent over the last decade and was at 0 in FY 2000. The percentage of O-6 OTs decreased slightly, from 22 percent in FY 1987 to 19 percent in FY 2000.

Board Certification, Experience & Training:

The percentage of board-certified Navy OTs decreased over most of the decade, from 73 percent in FY 1987 to 58 percent in FY 1999, yet reached 70 percent in FY 2000. The percentage of board-certified OTs in the civilian sector, however, rose from about 73 percent in 1989 to 76 percent in 1999. The average years of practice (YOP) in specialty for duty Navy OTs increased from 4.7 to 7.0 years between FY 1987 and FY 2000. The number of Navy OT residents rose from 35 in FY 1987 to 46 in FY 1992, but subsequently fell to 25 residents by FY 2000. The number of Navy OT fellows ranged from 1 to 3 throughout the decade, with the exception of 0 in FY 1992 and 7 in FY 1994.

* Variation may be due to missing 9 percent of data for marital status and dependents in FY 2000.

Pathology

	FY87	FY88	FY89	FY90	FY91	FY92	FY93	FY94	FY95	FY96	FY97	FY98	FY99	FY00
Duty physicians	75	81	88	87	94	88	90	94	91	85	86	83	84	83
Percent of all duty specialists	5%	5%	5%	5%	5%	4%	4%	5%	5%	4%	4%	4%	4%	4%
Average age (years)	39.3	39.9	40.9	41.9	42.3	43.4	42.8	43.0	42.8	43.6	43.8	43.7	43.4	43.5
Male physicians	84%	83%	75%	76%	79%	81%	80%	80%	80%	78%	78%	81%	76%	75%
Ethnicity														
White	80%	81%	83%	83%	80%	82%	80%	81%	86%	86%	90%	89%	86%	88%
Black	1%	1%	1%	1%	2%	2%	6%	4%	5%	6%	5%	5%	6%	6%
Asian	7%	7%	8%	7%	6%	7%	6%	5%	7%	5%	2%	2%	1%	1%
Other	4%	5%	5%	5%	4%	3%	3%	3%	2%	2%	1%	1%	2%	1%
Unknown	8%	5%	3%	5%	7%	6%	6%	6%	0%	1%	2%	2%	5%	4%
Marital status														
Married	79%	79%	76%	78%	73%	76%	78%	77%	82%	76%	79%	82%	81%	81%
Married to AD	8%	6%	8%	6%	7%	9%	9%	10%	8%	13%	12%	10%	10%	7%
Single	11%	11%	14%	16%	17%	15%	13%	13%	10%	11%	9%	8%	8%	*
Unknown	3%	4%	2%	0%	2%	0%	0%	1%	0%	0%	0%	0%	1%	12%
Average no. of dependents														
If married	2	2	2	2	2	2	2	2	2	2	2	2	2	2
If married to AD	1	1	0	1	1	1	0	0	1	0	0	1	1	1
If single	0	0	0	0	0	0	0	0	0	0	0	0	0	*
Average YOCS	9.4	9.3	9.4	9.6	10.2	11.0	10.8	10.8	11.6	12.2	12.3	12.7	12.7	13.2
Average YOS	9.6	9.6	9.7	9.9	10.4	11.2	11.1	11.2	11.9	12.7	12.8	13.2	13.1	13.5
Paygrade														
Percent O-3	8%	9%	5%	3%	3%	3%	7%	4%	3%	5%	3%	5%	1%	4%
Percent O-4	49%	40%	48%	45%	41%	28%	30%	35%	36%	29%	34%	29%	36%	28%
Percent O-5	21%	27%	25%	28%	34%	41%	39%	40%	41%	42%	41%	41%	43%	49%
Percent O-6	21%	25%	23%	24%	21%	27%	24%	20%	20%	24%	22%	25%	20%	19%
Percent board certified	81%	86%	84%	84%	81%	74%	71%	72%	67%	67%	71%	67%	58%	67%
Average YOP in Specialty	7.0	7.5	8.3	8.9	9.3	10.1	9.0	9.0	8.6	9.3	9.4	9.3	8.9	8.7
Residents in training	28	26	33	35	34	39	24	24	29	25	25	20	16	14
Fellows	0	2	2	3	3	4	4	4	0	2	2	2	2	1

Trends

Population:

The number of fully trained duty pathologists (PAs) in the Navy increased from 75 in FY 1987 to 94 specialists in FY 1994, yet decreased to 83 specialists by FY 2000 (about an 11-percent increase overall). The number of PAs in the civilian sector rose from 16,594 specialists in 1988 to 18,701 in 1999—an approximate 14-percent increase.

Percent of All Duty Specialists:

From FY 1987 to FY 2000, the percentage of PAs decreased from 5 to 4 percent of all active duty Navy specialists.

Age & Gender:

The average age of Navy PAs increased over the past decade from 39.3 years in FY 1987 to 43.5 years in FY 2000. Civilian PAs also appear to have gotten older in recent years. While the percentage of civilian PAs under age 35 years fell from about 18 to 10 percent between 1989 and 1999, the percentage of those age 65 and older rose from about 8 to 15 percent. Furthermore, between 1988 and 1999, the most common age group for civilian PAs shifted from 35 to 44 years to 45 to 54 years. The percentage of female Navy PAs increased from about 16 percent in FY 1987 to 25 percent in FY 2000. The percentage of female civilian PAs also rose, from about 22 to 29 percent between 1988 and 1999.

Ethnicity:

The percentage of minority Navy PAs decreased from 12 percent in FY 1987 to 8 percent in FY 2000. During this time, the percentage of black Navy PAs rose from 1 to 6 percent, while that of Asian PAs fell from 7 to 1 percent. The percentage of those of other race or ethnicity also decreased from 4 to 1 percent over the last decade.

Marital Status & Dependents:

The percentage of married Navy PAs (not married to active duty (AD) individuals) increased slightly throughout the decade, from 79 percent in FY 1987 to 81 percent in FY 2000. The percentage of those married to AD ranged from 6 to 13 percent during this time, whereas the percentage of single Navy PAs decreased from 11 to 8 percent between FY 1987 and FY 1999. From FY 1987 to FY 2000, the average number of dependents was 2 for married Navy PAs (not to AD), 1 for those married to AD, and 0 for single PAs.

Years of Commissioned Service (YOCs), Years of Service (YOS) & Paygrade:

The average YOCs and average YOS for Navy PAs both increased by about 4 years from FY 1987 to FY 2000. During this time, the average YOCs increased from 9.4 to 13.2 years and the average YOS rose from 9.6 to 13.5 years. Although most Navy PAs were O-4s from FY 1987 to FY 1991, for the remainder of the decade most were O-5s. The percentage of O-4s decreased from 49 to 28 percent between FY 1987 and FY 2000, while the percentage of O-5s increased from 21 to 49 percent. The percentage of O-3s fell from 8 percent in FY 1987 to only 4 percent by FY 2000, while the percentage of O-6s ranged from 19 to 27 percent throughout the decade.

Board Certification, Experience & Training:

The percentage of board-certified Navy PAs decreased from 81 percent in FY 1987 to 67 percent in FY 2000. The percentage of civilian board-certified PAs, however, increased slightly from about 77 to 79 percent between 1989 and 1999. The average years of practice (YOP) in specialty for duty Navy PAs ranged from 7 to 10 years from FY 1987 to FY 2000, with an average of 8.8 years. The Navy had twice as many PA residents in FY 1987 as in FY 2000—the number dropping from 28 to 14. The number of Navy PA fellows ranged from 0 to 4 throughout the decade.

* FY 2000 marital status and dependents data for singles have been excluded because 12 percent of the data are missing and the values are inconsistent with those of previous years.

Pediatrics

	FY87	FY88	FY89	FY90	FY91	FY92	FY93	FY94	FY95	FY96	FY97	FY98	FY99	FY00
Duty physicians	181	183	183	160	152	141	142	132	171	168	168	172	164	175
Percent of all duty specialists	11%	11%	10%	9%	8%	7%	7%	7%	9%	8%	8%	8%	8%	8%
Average age (years)	37.4	38.0	39.2	39.6	39.5	40.4	39.8	39.9	40.3	40.0	40.4	40.1	39.6	39.6
Male physicians	77%	77%	79%	78%	78%	78%	77%	73%	71%	67%	64%	62%	60%	59%
Ethnicity														
White	67%	70%	82%	80%	78%	78%	79%	79%	85%	85%	87%	85%	84%	78%
Black	1%	1%	2%	1%	2%	2%	1%	2%	2%	3%	2%	3%	3%	3%
Asian	4%	4%	6%	6%	6%	6%	6%	6%	5%	5%	4%	4%	5%	5%
Other	6%	7%	7%	8%	9%	9%	11%	9%	6%	6%	5%	5%	4%	3%
Unknown	22%	17%	4%	5%	5%	5%	4%	4%	1%	1%	1%	3%	5%	10%
Marital status														
Married	71%	69%	69%	71%	70%	68%	66%	69%	64%	66%	68%	67%	62%	55%
Married to AD	9%	8%	9%	9%	9%	9%	12%	11%	16%	15%	14%	18%	19%	19%
Single	18%	23%	21%	19%	22%	23%	22%	20%	19%	18%	18%	13%	15%	*
Unknown	2%	0%	1%	1%	0%	1%	0%	0%	0%	0%	0%	1%	4%	24%
Average no. of dependents														
If married	2	2	2	2	2	2	2	1	2	2	2	2	2	2
If married to AD	1	1	1	1	1	1	1	1	1	1	1	1	1	1
If single	0	0	0	0	0	0	0	0	0	0	0	0	0	*
Average YOCs	9.0	9.2	9.7	9.7	9.8	10.2	9.9	10.4	10.8	10.8	11.1	11.0	10.6	10.3
Average YOS	9.0	9.2	9.8	9.8	9.9	10.4	10.2	10.7	11.1	11.0	11.5	11.3	10.9	10.6
Paygrade														
Percent O-3	24%	20%	13%	18%	22%	19%	27%	26%	22%	26%	25%	28%	23%	26%
Percent O-4	28%	30%	36%	33%	33%	36%	33%	30%	30%	30%	29%	22%	32%	33%
Percent O-5	29%	27%	25%	24%	22%	21%	22%	25%	25%	23%	25%	34%	33%	27%
Percent O-6	18%	22%	26%	26%	24%	23%	18%	19%	23%	22%	21%	17%	12%	14%
Percent board certified	54%	58%	63%	67%	66%	72%	65%	65%	53%	54%	57%	52%	57%	53%
Average YOP in Specialty	6.7	7.3	8.3	8.5	8.4	9.0	8.4	8.7	9.6	9.5	9.5	9.1	8.4	8.1
Residents in training	33	37	43	47	38	35	31	33	33	34	31	28	37	41
Fellows	18	8	5	7	7	8	7	6	18	20	15	10	10	12

Trends

Population:

The number of fully trained duty pediatricians (PDs) in the Navy decreased from 181 in FY 1987 to 132 in FY 1994, and subsequently increased to 175 specialists by FY 2000. The civilian sector experienced a steady rise in the number of PDs throughout the past decade, from 39,540 specialists in 1988 to 61,024 in 1999—an approximate 54-percent increase.

Percent of All Duty Specialists:

From FY 1987 to FY 2000, the percentage of PDs decreased from 11 to 8 percent of all active duty Navy specialists.

Age & Gender:

The average age of Navy PDs ranged from 37.4 to 40.4 years between FY 1987 and FY 2000, with an average of 39.6 years. Similarly, among civilian PDs, the most common age group from 1989 to 1999 was 35 to 44 years—ranging from 30 to 35 percent. The second most common age group for civilian PDs was under 35 years in 1989 (about 30 percent), but 45-54 years throughout the rest of the decade (ranging from 20 to 25 percent). Furthermore, the percentage of civilian PDs age 55 to 64 years and age 65 and older both rose by about 2 percentage points during this time. The percentage of female Navy PDs increased dramatically between FY 1987 to FY 2000, from 23 to 41 percent. The civilian sector also experienced a large percentage increase in female PDs, from 36 to 47 percent between 1988 and 1999.

Ethnicity:

The percentage of minority PDs in the Navy decreased only slightly throughout the decade, from 14 to 13 percent between FY 1987 and FY 2000. During this time, the percentage of black Navy PDs rose from 1 to 4 percent, while those categorized as other race or ethnicity fell from 8 to 4 percent. The percentage of Asian Navy PDs remained relatively stable, ranging from 4 to 7 percent between FY 1987 and FY 2000.

Marital Status & Dependents:

The percentage of married Navy PDs (not married to active duty (AD) individuals) decreased from 71 percent in FY 1987 to 55 percent in FY 2000, whereas the percentage of those married to AD increased from 9 to 19 percent during this time. The percentage of single Navy PDs also decreased slightly, from 18 to 15 percent between FY 1987 and FY 1999. From FY 1987 to FY 2000, the average number of dependents was 2 for married Navy PDs (not to AD), 1 for those married to AD, and 0 for single PDs.

Years of Commissioned Service (YOCs), Years of Service (YOS) & Paygrade:

The average YOCs for Navy PDs increased from 9.0 years in FY 1987 to 10.3 years in FY 2000, while the average YOS rose from 9.0 to 10.6 years. From FY 1987 to FY 2000, most Navy PDs were either O-4s (ranging from 22 to 36 percent) or O-5s (ranging from 21 to 34 percent). The percentage of O-3s increased slightly during this time period, from 24 to 26 percent, while the percentage of O-6s decreased from 18 to 14 percent.

Board Certification, Experience & Training:

The percentage of board-certified Navy PDs increased during the first half of the decade from 54 percent in FY 1987 to 72 percent in FY 1992, and subsequently decreased to 53 percent by FY 2000. The percentage of board-certified civilian PDs, however, steadily increased over the decade from about 61 to 73 percent between 1989 and 1999. The average years of practice (YOP) in specialty for duty Navy PDs increased from 6.7 to 8.1 years between FY 1987 and FY 2000, reaching a high of 9.6 years in FY 1995. The number of Navy PD residents ranged from 28 to 41 residents, with an average of about 36 residents during this same time period. The number of Navy PD fellows varied greatly between FY 1987 and FY 2000, ranging from 6 to 20 fellows.

* FY 2000 marital status and dependents data for singles have been excluded because 24 percent of the data are missing and the values are inconsistent with those of previous years.

Physical medicine

	FY87	FY88	FY89	FY90	FY91	FY92	FY93	FY94	FY95	FY96	FY97	FY98	FY99	FY00
Duty physicians	3	4	3	3	3	1	1	2	2	4	4	5	5	4
Percent of all duty specialists	0.2%	0.2%	0.2%	0.2%	0.2%	0.1%	0.0%	0.1%	0.1%	0.2%	0.2%	0.2%	0.2%	0.2%
Average age (years)	34.0	34.0	35.3	36.3	37.3	38.0	39.0	39.5	40.5	39.3	40.3	40.6	41.6	42.0
Male physicians	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Ethnicity														
White	33%	25%	100%	100%	100%	100%	100%	100%	100%	75%	75%	80%	80%	75%
Black	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Asian	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Other	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Unknown	67%	75%	0%	0%	0%	0%	0%	0%	0%	25%	25%	20%	20%	25%
Marital status														
Married	67%	75%	67%	67%	33%	0%	0%	0%	0%	75%	75%	80%	80%	75%
Married to AD	33%	25%	33%	33%	67%	100%	100%	50%	50%	25%	25%	20%	20%	25%
Single	0%	0%	0%	0%	0%	0%	0%	50%	50%	0%	0%	0%	0%	0%
Unknown	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Average no. of dependents														
If married	1	1	1	1	1					1	1	2	2	2
If married to AD	1	1	2	2	2	1	2	2	2	2	3	3	3	3
If single								0	0					
Average YOCs	5.7	5.0	6.7	7.7	8.7	5.0	6.0	8.0	9.0	9.0	10.0	11.0	12.0	12.5
Average YOS	5.7	5.0	6.7	7.7	8.7	5.0	6.0	8.0	9.0	9.0	10.0	11.0	12.0	12.5
Paygrade														
Percent O-3	33%	50%	67%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Percent O-4	33%	25%	0%	67%	67%	100%	100%	50%	50%	50%	25%	20%	20%	25%
Percent O-5	33%	25%	33%	33%	33%	0%	0%	50%	50%	50%	75%	80%	80%	50%
Percent O-6	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	25%
Percent board certified	0%	25%	67%	67%	67%	100%	100%	50%	100%	50%	100%	80%	100%	100%
Average YOP in Specialty	1.3	1.8	3.0	4.0	5.0	5.0	6.0	3.5	4.5	2.8	3.8	4.0	5.0	6.0
Residents in training	0	0	0	0	1	1	3	2	3	1	1	1	3	6
Fellows	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Trends

Population:

The number of fully trained duty physical medicine (PM) physicians in the Navy ranged from 1 to 5 specialists between FY 1987 and FY 2000. In the civilian sector, the number of PM physicians increased over the last decade, from 3,729 specialists in 1988 to 6,114 in 1999.

Percent of All Duty Specialists:

From FY 1987 to FY 2000, PM physicians accounted for only 0.0 to 0.2 percent of all active duty Navy specialists.

Age & Gender:

The average age of Navy PM physicians increased from 34.0 years in FY 1987 to 42.0 years in FY 2000, with an average of 38.4 years. Civilian PM physicians also appear to have gotten older over the last decade. While the percentage of those under age 35 decreased from about 30 to 17 percent between 1989 and 1999, the percentage of civilian PM physicians age 35 to 44 years increased from about 33 to 39 percent. The percentage of civilian PM physicians 45 to 54 years and 65 years and older also increased during this time period. The percentage of those 55 to 64 years fell slightly from about 13 to 12 percent between 1989 and 1999. There were no female PM physicians in the Navy from FY 1987 to FY 2000. In the civilian sector, however, the percentage of female PM physicians rose from about 29 percent in 1988 to 32 percent in 1999.

Ethnicity:

All Navy PMs were Caucasian from FY 1987 to FY 2000.

Marital Status & Dependents:

The composition of Navy PMs by marital status varied greatly throughout the decade, although most Navy PMs were married between FY 1987 and FY 2000. The percentage of single Navy PMs was 0 in all years except FY 1994 and FY 1995. From FY 1987 to FY 2000, the average number of dependents ranged from 1 to 2 for married Navy PMs (not to AD), and from 1 to 3 for those married to AD. In FY 1994 and FY 1995, the average number of dependents for single PMs was 0.

Years of Commissioned Service (YOCS), Years of Service (YOS) & Paygrade:

The average YOCS and average YOS for Navy PMs both increased dramatically from 5.7 to 12.5 years between FY 1987 and FY 2000. The composition of Navy PMs by paygrade varied greatly throughout the past decade. In FY 1987, Navy PMs were equally divided between O-3s, O-4s, and O-5s (all at 33 percent). In FY 2000, however, 25 percent were O-4s, 50 percent were O-5s, and 25 percent were O-6s.

Board Certification, Experience & Training:

Although no Navy PMs were board certified in FY 1987, by FY 2000 all were board certified. The percentage of board-certified civilian PMs also increased over the last decade, from about 57 percent in 1989 to 66 percent in 1999. The average years of practice (YOP) in specialty for duty Navy PMs rose from 1.3 to 6.0 years from FY 1987 to FY 2000. There were no Navy PM residents until FY 1991. Between FY 1991 and FY 2000, the number of residents ranged from 1 to 6.

Note:

The variability in the demographics of Navy PMs is due to the small number of PMs.

Preventive/occupational medicine

	FY87	FY88	FY89	FY90	FY91	FY92	FY93	FY94	FY95	FY96	FY97	FY98	FY99	FY00
Duty physicians	28	36	47	53	61	63	60	53	49	52	51	56	58	66
Percent of all duty specialists	2%	2%	3%	3%	3%	3%	3%	3%	2%	3%	3%	3%	3%	3%
Average age (years)	40.5	40.1	40.5	41.0	41.3	41.5	42.8	42.7	43.5	44.4	44.6	45.3	44.5	43.5
Male physicians	100%	89%	89%	85%	84%	86%	85%	83%	78%	77%	78%	84%	78%	73%
Ethnicity														
White	86%	89%	87%	91%	89%	87%	90%	94%	98%	98%	98%	98%	100%	97%
Black	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	2%
Asian	0%	0%	0%	0%	0%	2%	2%	2%	2%	2%	2%	2%	0%	0%
Other	7%	8%	6%	4%	3%	3%	3%	2%	0%	0%	0%	0%	0%	0%
Unknown	7%	3%	6%	6%	8%	8%	5%	2%	0%	0%	0%	0%	0%	2%
Marital status														
Married	89%	81%	83%	81%	84%	76%	78%	75%	71%	69%	73%	75%	67%	68%
Married to AD	0%	3%	2%	2%	5%	2%	0%	2%	2%	8%	6%	4%	5%	6%
Single	11%	14%	15%	17%	11%	22%	22%	23%	27%	23%	22%	21%	28%	*
Unknown	0%	3%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	21%
Average no. of dependents														
If married	2	1	1	2	1	2	2	2	2	2	2	2	2	2
If married to AD		1	2	0	0	1		0	3	3	4	3	1	1
If single	1	0	0	0	1	1	1	1	1	0	0	0	0	*
Average YOCS	9.8	9.3	10.0	10.8	11.4	12.2	13.2	13.2	13.6	14.2	14.4	15.4	15.2	14.6
Average YOS	10.0	9.7	10.4	11.3	11.8	12.6	13.6	13.7	14.2	14.9	15.2	16.1	15.6	14.9
Paygrade														
Percent O-3	0%	8%	2%	0%	0%	0%	0%	0%	2%	0%	0%	0%	2%	6%
Percent O-4	32%	36%	36%	36%	31%	35%	32%	26%	18%	13%	18%	14%	19%	24%
Percent O-5	54%	39%	43%	40%	44%	40%	38%	47%	53%	56%	53%	52%	48%	39%
Percent O-6	14%	17%	19%	25%	25%	25%	30%	26%	27%	31%	29%	34%	31%	30%
Percent board certified	57%	39%	47%	49%	39%	57%	73%	75%	71%	71%	67%	61%	60%	55%
Average YOP in Specialty	6.4	5.8	5.4	5.7	5.4	4.7	5.9	5.3	5.5	6.1	6.3	6.5	7.1	6.9
Residents in training	27	22	32	28	11	5	6	13	16	15	14	17	19	15
Fellows	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Trends

Population:

The number of fully trained duty preventive/occupational medicine (PM/OM) physicians more than doubled over the last decade, from 28 specialists in FY 1987 to 66 in FY 2000. The number of civilian PM/OH physicians also increased during this time, from 3,772 specialists in 1988 to 6,506 in 1999—an approximate 73-percent increase.

Percent of All Duty Specialists:

From FY 1987 to FY 2000, the percentage of PM/OM physicians increased from 2 to 3 percent of all active duty Navy specialists.

Age & Gender:

The average age of Navy PM/OM physicians rose from 40.5 in FY 1987 to 43.5 in FY 2000—with an average of 42.6 years during this time period. The civilian sector also experienced a shift in the ages of PM/OM physicians during the decade. The percentage of civilian PM/OM physicians 35 years and under decreased from about 9 to 3 percent from 1989 to 1999, while those 65 years and over increased from about 24 to 27 percent. The most common age group switched from 55 to 64 years (about 27 percent) in 1989 to 45 to 54 (about 30 percent) by 1999. The second most common age group for civilian PM/OM physicians in both 1989 and 1999 was 65 years and over (reaching a high of 27 percent in 1999). Although there were no female Navy PM/OM physicians in FY 1987, by FY 2000, 27 percent were female. In the civilian sector, the percentage of female PM/OM physicians increased from about 13 percent in 1988 to 24 percent in 1999.

Ethnicity:

The percentage of minority Navy PM/OM physicians fell from 8 to 2 percent between FY 1987 and FY 2000. There were no black PM/OM physicians in the Navy until FY 2000.

Marital Status & Dependents:

The percentage of married Navy PM/OM physicians (not married to active duty (AD) individuals) decreased from 89 percent in FY 1987 to 68 percent in FY 2000, whereas the percentage of those married to AD increased from 0 to 6 percent. The percentage of single Navy PM/OM physicians increased from 11 to 28 percent between FY 1987 and FY 1999. From FY 1987 to FY 2000, the average number of dependents ranged from 1 to 2 for married Navy PM/OM physicians (not to AD), and from 0 to 4 for those married to AD. The average number of dependents for single PM/OM physicians ranged from 0 to 1 between FY 1987 and FY 1999.

Years of Commissioned Service (YOC), Years of Service (YOS) & Paygrade:

The average YOC for Navy PM/OM physicians increased dramatically from 9.8 years in FY 1987 to 14.6 years in FY 2000, and the average YOS for these specialists rose from 10.0 to 14.9 years. In FY 1987, 54 percent of Navy PM/OM physicians were O-4s. However, by FY 2000, the percentage of O-4s decreased to 39 percent, while the percent of O-6s increased from 14 to 30 percent. The percentage of O-4s decreased from 32 percent in FY 1987 to 24 percent in FY 2000. The percentage of O-3s was 0 throughout most of the decade, yet reached 6 percent in FY 2000.

Board Certification, Experience & Training:

The percentage of board-certified Navy PM/OM physicians increased during the first half of the decade, from 57 percent in FY 1987 to 75 percent in FY 1994, but decreased to 55 percent by FY 2000. The civilian sector, on the other hand, witnessed a steady increase in the percentage of board-certified PM/OM physicians, from about 49 to 64 percent between 1988 and 1999. The average years of practice (YOP) in specialty for duty Navy PM/OM physicians ranged from 4.7 to 7.1 years between FY 1987 and FY 2000, with an average of 5.9 years during this time. The number of Navy PM/OM residents decreased from 27 residents in FY 1987 to 15 in FY 2000.

* FY 2000 marital status and dependents data for singles have been excluded because 21 percent of the data are missing and the values are inconsistent with those of previous years.

Psychiatry

	FY87	FY88	FY89	FY90	FY91	FY92	FY93	FY94	FY95	FY96	FY97	FY98	FY99	FY00
Duty physicians	87	85	91	99	109	121	125	113	109	103	95	98	97	97
Percent of all duty specialists	5%	5%	5%	5%	6%	6%	6%	6%	6%	5%	5%	5%	5%	5%
Average age (years)	40.8	40.9	40.9	41.7	41.9	42.1	42.2	42.3	42.6	42.5	42.5	41.8	41.9	41.9
Male physicians	90%	86%	84%	86%	88%	88%	86%	86%	86%	84%	83%	84%	78%	77%
Ethnicity														
White	76%	75%	80%	78%	73%	79%	80%	82%	87%	85%	86%	87%	87%	82%
Black	3%	5%	2%	5%	6%	6%	6%	4%	4%	5%	4%	5%	3%	4%
Asian	6%	5%	4%	5%	5%	4%	4%	4%	6%	5%	3%	4%	5%	4%
Other	3%	6%	5%	4%	4%	2%	2%	3%	4%	4%	4%	2%	2%	3%
Unknown	11%	9%	8%	8%	12%	9%	7%	6%	0%	1%	2%	2%	3%	6%
Marital status														
Married	75%	74%	73%	72%	79%	74%	71%	73%	72%	72%	69%	70%	71%	71%
Married to AD	5%	6%	7%	4%	2%	2%	5%	4%	6%	6%	5%	4%	5%	6%
Single	21%	18%	16%	23%	19%	23%	24%	23%	22%	22%	25%	24%	22%	*
Unknown	0%	2%	4%	1%	0%	0%	0%	0%	0%	0%	0%	1%	2%	16%
Average no. of dependents														
If married	2	2	2	2	2	2	2	2	2	2	2	2	2	2
If married to AD	1	0	0	1	0	0	0	1	0	1	1	0	0	1
If single	0	0	1	0	0	0	0	0	0	0	0	0	0	*
Average YOCs	10.4	10.3	9.6	9.8	10.2	10.2	10.5	11.3	11.8	12.1	12.4	11.4	11.7	12.0
Average YOS	10.6	10.6	9.9	10.1	10.5	10.6	10.9	11.7	12.3	12.5	12.6	11.8	12.1	12.5
Paygrade														
Percent O-3	7%	9%	8%	11%	8%	11%	14%	9%	11%	15%	15%	13%	14%	18%
Percent O-4	33%	33%	35%	32%	39%	37%	32%	37%	34%	32%	31%	33%	36%	36%
Percent O-5	30%	29%	31%	30%	29%	28%	32%	29%	31%	28%	28%	34%	28%	27%
Percent O-6	30%	28%	26%	26%	24%	24%	22%	25%	24%	25%	26%	20%	22%	20%
Percent board certified	56%	54%	51%	48%	49%	45%	50%	60%	54%	54%	49%	51%	58%	52%
Average YOP in Specialty	8.6	8.6	8.4	8.6	8.1	8.0	8.0	8.7	9.0	8.8	9.3	8.2	8.2	8.3
Residents in training	34	37	41	44	36	31	26	34	33	31	29	27	28	23
Fellows	2	4	6	7	4	0	2	2	4	4	5	4	3	4

Trends

Population:

The number of fully trained duty psychiatrists (PYs) in the Navy increased during the first half of the decade, from 87 specialists in FY 1987 to 125 in FY 1993, and subsequently decreased to 97 by FY 2000. The civilian sector, on the other hand, witnessed a steady rise in PYs, from 37,786 specialists in 1988 to 44,927 in 1999—an approximate 19-percent increase.

Percent of All Duty Specialists:

PYs accounted for about 5 percent of all active duty Navy specialists in most years from FY 1987 to FY 2000. However, between FY 1991 and FY 1995 they accounted for 6 percent.

Age & Gender:

The average age of Navy PYs ranged from 40.8 to 42.5 years between FY 1987 and FY 2000, with an average of 41.9 years. In the civilian sector, the most common age group for PYs switched from 35 to 44 years from 1989 to 1995 (about 28 to 29 percent), to 45 to 54 years from 1996 to 1999 (about 28 percent). From 1989 to 1999, the percentage of civilian PYs under 35 years fell from about 17 to 9 percent, while the percentage of those 65 years and older rose from about 11 to 19 percent. The percentage of those 55 to 64 years ranged from 18 to 21 percent during this same time period. The percentage of female Navy PYs increased from 10 percent in FY 1987 to 23 percent in FY 2000. The percentage of civilian PYs also increased, from about 24 to 30 percent from 1989 to 1999.

Ethnicity:

The percentage of minority Navy PYs decreased slightly over the past decade, from 14 percent in FY 1987 to 11 percent in FY 2000. The percentage of black Navy PYs ranged from 2 to 7 percent during this time, while the percentage of Asian PYs ranged from 3 to 6 percent. The percentage of those categorized as other race or ethnicity ranged from 2 to 6 percent from FY 1987 to FY 2000.

Marital Status & Dependents:

The percentage of married Navy PYs (not married to active duty (AD) individuals) decreased from 75 percent in FY 1987 to 71 percent in FY 2000. The percentage of those married to AD decreased from 5 to 2 percent between FY 1987 and FY 1991, but increased to 6 percent by FY 2000. The percentage of single Navy PYs ranged from 16 to 25 percent between FY 1987 and FY 1999. The average number of dependents was 2 for married Navy PYs (not to AD) from FY 1987 to FY 2000. The average number of dependents for those married to AD ranged from 0 to 1 during this same time, while it was 0 in most years for single PYs.

Years of Commissioned Service (YOCs), Years of Service (YOS) & Paygrade:

The average YOCs for Navy PYs increased from 10.4 years in FY 1987 to 12.0 years in FY 2000, while the average YOS rose from 10.6 to 12.5 years during the same time. Most Navy PYs were O-4s (ranging from 32 to 37 percent), O-5s (ranging from 27 to 34 percent), or O-6s (ranging from 20 to 30 percent) from FY 1987 to FY 2000. During this time, the percentage of O-3s increased from 7 to 18 percent, while the percentage of O-6s decreased from 30 to 20 percent.

Board Certification, Experience & Training:

The percentage of board-certified Navy PYs ranged from 48 to 58 percent between FY 1987 and FY 2000. The civilian sector experienced a steady increase in the percentage of board-certified PYs, from about 51 percent in FY 1987 to 60 percent in FY 2000. The average years of practice (YOP) in specialty for duty Navy PYs varied little over the last decade, ranging from 8.0 to 9.3 years from FY 1987 to FY 2000. The number of Navy PY residents decreased from 34 to 23 residents during this same time. The number of Navy PY fellows ranged from 0 to 6 between FY 1987 to FY 2000, with an average of 3.6 fellows.

* FY 2000 marital status and dependents data for singles have been excluded because 16 percent of the data are missing and the values are inconsistent with those of previous years.

Therapeutic radiology

	FY87	FY88	FY89	FY90	FY91	FY92	FY93	FY94	FY95	FY96	FY97	FY98	FY99	FY00
Duty physicians	8	11	7	8	10	10	9	9	10	12	10	8	9	8
Percent of all duty specialists	0%	1%	0%	0%	1%	1%	0%	0%	1%	1%	0%	0%	0%	0%
Average age (years)	37.1	35.9	35.0	34.6	35.6	36.0	36.8	37.7	38.5	38.1	40.8	40.6	41.1	41.3
Male physicians	88%	73%	57%	63%	90%	90%	89%	89%	90%	92%	90%	100%	100%	100%
Ethnicity														
White	88%	82%	100%	88%	70%	80%	78%	89%	100%	100%	100%	100%	89%	88%
Black	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Asian	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	11%	13%
Other	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Unknown	13%	18%	0%	13%	30%	20%	22%	11%	0%	0%	0%	0%	0%	0%
Marital status														
Married	50%	55%	71%	63%	70%	90%	89%	78%	80%	92%	90%	88%	89%	100%
Married to AD	0%	9%	14%	13%	10%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Single	50%	36%	14%	25%	20%	10%	11%	22%	20%	8%	10%	13%	11%	0%
Unknown	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Average no. of dependents														
If married	2	2	1	1	1	1	1	1	1	1	1	1	2	2
If married to AD	0	0	0	0	0	0	0	0	0	0	0	0	0	0
If single	0	0	0	0	0	0	0	0	0	0	0	2	2	2
Average YOCs	10.4	8.3	6.9	5.9	7.6	8.1	8.9	11.2	12.0	10.0	12.8	10.6	11.6	13.6
Average YOS	10.6	8.5	6.9	5.9	7.6	8.1	8.9	11.2	12.0	10.3	13.2	11.1	12.0	14.1
Paygrade														
Percent O-3	13%	27%	14%	25%	20%	20%	0%	0%	0%	8%	10%	13%	0%	0%
Percent O-4	38%	27%	57%	63%	70%	70%	89%	67%	70%	67%	30%	25%	44%	38%
Percent O-5	38%	36%	14%	0%	0%	0%	0%	22%	20%	25%	50%	50%	44%	50%
Percent O-6	13%	9%	14%	13%	10%	10%	11%	11%	10%	0%	10%	13%	11%	13%
Percent board certified	25%	55%	86%	63%	30%	80%	89%	78%	80%	67%	70%	50%	56%	63%
Average YOP in Specialty	5.4	4.5	4.9	3.9	3.2	3.7	4.2	5.0	4.4	2.5	5.1	4.5	4.9	5.9
Residents in training	2	3	3	5	0	5	6	6	5	4	4	4	4	4
Fellows	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Trends														

Population:

The number of fully trained duty therapeutic radiologists (TRs) in the Navy ranged from 7 to 12 specialists between FY 1987 and FY 2000. In the civilian sector, the number of TRs increased over the past decade, from 2,596 specialists in 1988 to 3,787 in 1999—an approximate 46-percent increase.

Percent of All Duty Specialists:

From FY 1987 to FY 2000, the percentage of TRs ranged from 0 to 1 percent of all active duty Navy specialists.

Age & Gender:

The average age of Navy TRs increased from 37.1 years in FY 1987 to 41.3 years in FY 2000. Civilian TRs also appear to have gotten older over the last decade. The percentage of those age 35 and under decreased from about 25 to 13 percent between 1989 and 1999, while the percentage of those in all other age groups increased by about 1 to 5 percentage points. The most common age group from 1989 to 1999 was 35 to 44 years for civilian TRs.

Ethnicity:

There were no minority TRs in the Navy from FY 1987 to FY 1998. However, the Navy had 11 percent Asian TRs in FY 1999 and 13 percent Asian TRs in FY 2000.

Marital Status & Dependents:

The percentage of married Navy TRs (not married to active duty (AD) individuals) increased dramatically throughout the decade, from 50 percent in FY 1987 to 100 percent in FY 2000. The percentage of single Navy TRs, on the other hand, decreased from 50 to 0 percent during this time. The percentage of Navy TRs married to AD was 0 in most years, yet ranged from 9 to 14 percent between FY 1988 and FY 1990. From FY 1987 to FY 2000, the average number of dependents ranged from 1 to 2 for married Navy TRs (not to AD). The average number of dependents for those married to AD was 0 from FY 1988 to FY 1991, and was 0 for single Navy TRs in most years.

Years of Commissioned Service (YOCs), Years of Service (YOS) & Paygrade:

The average YOCs for Navy TRs increased from 10.4 years in FY 1987 to 13.6 years in FY 2000, while the average YOS rose from 10.6 to 14.1 years. The composition of Navy TRs by paygrade varied greatly from FY 1987 to FY 2000. During this time, the percentage of O-3s ranged from 0 to 25 percent, that of O-4s from 25 to 89 percent, that of O-5s from 0 to 50 percent, and that of O-6s from 0 to 14 percent.

Board Certification, Experience & Training:

The percentage of board-certified Navy TRs increased during the first half of the decade, from 25 percent in FY 1987 to 89 percent in FY 1993, then decreased to 63 percent by FY 2000. The percentage of board-certified civilian TRs, on the other hand, decreased during the first half of the decade, from about 75 to 69 percent between 1989 and 1994, and subsequently increased to 79 percent by 1999. The average years of practice (YOP) in specialty for duty Navy TRs ranged from 2.5 to 5.9 years between FY 1987 and FY 2000, with an average of 4.4 years. The number of Navy TR fellows ranged from 0 to 6 throughout the decade.

Note:

The variability in the demographics of Navy TRs is due to the small number of TRs.

Urology

	FY87	FY88	FY89	FY90	FY91	FY92	FY93	FY94	FY95	FY96	FY97	FY98	FY99	FY00
Duty physicians	36	33	35	39	42	40	39	36	36	44	36	37	31	34
Percent of all duty specialists	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%	1%	2%
Average age (years)	38.0	37.1	37.5	37.0	36.9	37.6	38.3	38.7	38.7	38.8	39.3	38.9	40.4	40.3
Male physicians	94%	94%	91%	90%	90%	93%	92%	92%	92%	93%	92%	89%	84%	88%
Ethnicity														
White	78%	85%	89%	90%	83%	85%	90%	83%	89%	89%	83%	81%	90%	85%
Black	8%	0%	0%	0%	0%	0%	0%	6%	6%	5%	6%	5%	3%	3%
Asian	0%	0%	0%	0%	0%	0%	0%	3%	3%	5%	6%	3%	3%	3%
Other	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	3%	5%	0%	3%
Unknown	14%	15%	11%	10%	17%	15%	10%	8%	3%	2%	3%	5%	3%	6%
Marital status														
Married	89%	91%	89%	87%	88%	88%	87%	83%	86%	82%	83%	81%	77%	76%
Married to AD	6%	3%	9%	8%	7%	5%	5%	6%	3%	7%	11%	11%	16%	15%
Single	6%	3%	3%	5%	5%	8%	8%	11%	11%	11%	6%	5%	3%	0*
Unknown	0%	3%	0%	0%	0%	0%	0%	0%	0%	0%	0%	3%	3%	9%
Average no. of dependents														
If married	2	2	2	2	2	2	2	2	2	2	2	2	2	2
If married to AD	1	0	2	2	2	3	3	3	4	2	2	1	1	1
If single	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Average YOGS	10.0	8.8	9.7	8.5	8.5	9.2	10.6	11.1	11.3	11.2	11.9	11.2	12.7	12.6
Average YOS	10.1	8.9	9.7	8.5	8.5	9.2	10.9	11.5	11.7	11.6	12.1	11.5	13.1	12.9
Paygrade														
Percent O-3	0%	6%	0%	3%	2%	0%	0%	0%	0%	0%	0%	8%	0%	3%
Percent O-4	50%	55%	63%	67%	67%	70%	62%	58%	58%	59%	56%	41%	39%	41%
Percent O-5	31%	24%	20%	15%	17%	13%	15%	19%	19%	23%	28%	35%	42%	41%
Percent O-6	19%	15%	17%	15%	14%	18%	23%	22%	22%	18%	17%	16%	19%	15%
Percent board certified	61%	55%	57%	54%	43%	63%	54%	53%	53%	52%	39%	35%	39%	59%
Average YOP in Specialty	5.5	4.6	5.0	4.5	4.7	5.3	5.6	5.9	5.4	5.1	5.6	5.5	6.3	6.1
Residents in training	23	22	22	24	23	29	27	24	23	21	21	17	19	16
Fellows	1	1	2	1	0	0	1	1	1	0	1	1	2	3

Trends

Population:

The number of fully trained duty urologists (URs) in the Navy ranged from 31 to 44 specialists between FY 1987 and FY 2000, with an average of 37 specialists. In the civilian sector, the number of URs increased from 9,155 specialists in 1988 to 10,001 in 1999—an approximate 9-percent increase.

Percent of All Duty Specialists:

From FY 1987 to FY 2000, URs accounted for 2 percent of all active duty Navy specialists, with the exception of FY 1999 (when they accounted for 1 percent.)

Age & Gender:

The average age of Navy URs increased from 38.0 years in FY 1987 to 40.3 years in FY 2000, with an overall average of 38.4 years during this time. Civilian URs also appear to have gotten somewhat older in the past decade. The percentage of civilian URs under age 35 decreased from about 17 to 12 percent from 1989 to 1999, while the percentage of those 35 to 44 years fell from 28 to 24 percent. The percentage of civilian URs 45 to 54 years also decreased slightly from about 29 percent in 1989 to 26 percent in 1999. During this same time period, the percentage of those 55 to 64 years increased from about 17 to 25 percent, while the percentage of those over age 65 rose from 9 to 14 percent. The percentage of female Navy URs increased throughout the decade, from 6 percent in FY 1987 to 12 percent in FY 2000. In the civilian sector, the percentage of female URs rose only from 1 to 3 percent between 1988 and 1999.

Ethnicity:

In FY 1987, 10 percent of Navy URs were minorities (all black). Yet from FY 1988 to FY 1993, the Navy only had Caucasian URs. Since then, the percentage of minority Navy URs ranged from 6 to 15 percent: 3 to 6 percent black, 3 to 6 percent Asian, and 0 to 6 percent other race or ethnicity.

Marital Status & Dependents:

The percentage of married Navy URs (not married to active duty (AD) individuals) decreased from 89 percent in FY 1987 to 76 percent in FY 2000, whereas the percentage of those married to AD increased from 6 to 15 percent. The percentage of single Navy URs ranged from 3 to 11 percent in most years throughout the decade. From FY 1987 to FY 2000, the average number of dependents was 2 for married Navy URs (not to AD), and ranged from 0 to 4 dependents for those married to AD. The average number of dependents for single Navy URs was 0 from FY 1987 to FY 1999.

Years of Commissioned Service (YOCs), Years of Service (YOS) & Paygrade:

The average YOCs for Navy URs increased from 10.0 years in FY 1987 to 12.6 years in FY 2000, while the average YOS rose from 10.1 to 12.9 years. From FY 1987 to FY 2000, most Navy URs were either O-4s (decreasing from 50 to 41 percent during this time) or O-5s (increasing from 31 to 41 percent during this time). The percentage of O-3s was 0 in most years from FY 1987 to FY 2000, while the percentage of O-6s ranged from 14 to 23 percent.

Board Certification, Experience & Training:

The percentage of board-certified Navy URs ranged from 35 to 63 percent from FY 1987 to FY 2000. In the civilian sector, the percentage of board-certified URs increased from about 73 percent in 1989 to 78 percent in 1999. The average years of practice (YOP) in specialty for duty Navy URs increased slightly from 5.5 years in FY 1987 to 6.1 years in FY 2000. The number of Navy UR residents decreased from 23 to 16 during this same time period, despite reaching 29 residents in FY 1992. The number of Navy UR fellows ranged from 0 to 3 throughout the decade.

* Variation may be due to missing 9 percent of data for marital status and dependents in FY 2000.

Appendix B: AFHPSP (direct) cohort analysis

FY 1987 AFHPSP (direct) cohort

	FY87	FY88	FY89	FY90	FY91	FY92	FY93	FY94	FY95	FY96	FY97	FY98	FY99	FY00
Population	216	216	209	208	207	199	176	169	155	127	107	88	69	61
Attrition rate		0%	3%	0%	0%	4%	12%	4%	8%	18%	16%	18%	22%	12%
Cumulative attrition rate		0%	3%	4%	4%	8%	19%	22%	28%	41%	50%	59%	68%	72%
PCMOs	155	135	135	96	59	41	8	6	5	4	1	1	1	1
PCMOs to population		72%	65%	46%	29%	21%	5%	4%	3%	3%	1%	1%	1%	2%
PCMOs to initial population		72%	63%	44%	27%	19%	4%	3%	2%	2%	0%	0%	0%	0%
Residents/fellows (R/F)	61	74	94	94	99	95	77	40	22	9	7	7	3	3
R/F to population		28%	35%	45%	48%	48%	44%	24%	14%	7%	7%	8%	4%	4%
R/F to initial population		28%	34%	44%	46%	44%	36%	19%	10%	4%	3%	3%	1%	1%
Specialists				18	49	63	91	123	128	114	99	80	65	60
Specialists to population				9%	24%	32%	52%	73%	83%	90%	93%	91%	94%	98%
Specialists to initial population				8%	23%	29%	42%	57%	59%	53%	46%	37%	30%	28%
Number Board certified (BC)				6	15	25	45	63	74	63	55	43	31	28
BC to specialists				33%	31%	40%	49%	51%	58%	55%	56%	54%	48%	47%
Number attrited							1	4	15	27	18	19	19	8
Attrition rate							2%	4%	12%	21%	16%	19%	24%	12%
Cumulative no. of specialists				18	49	63	92	128	148	161	164	164	168	171
Cumulative no. attrited							1	5	20	47	65	84	103	111
Cumulative attrition rate							1%	4%	14%	29%	40%	51%	61%	65%
No. attrited w/o R/F program*			7	1	1	8	22	3	-1	1	2	0	0	0
Cumulative no. attrited			7	8	9	17	39	42	41	42	44	44	44	44
No. attrited to initial population			3%	4%	4%	8%	18%	19%	19%	19%	20%	20%	20%	20%

* Negative attrition values are possible because some individuals may have left the Navy and returned in later years.

In FY 1987, the Navy accessed 216 physicians from the AFHPSP (direct) pipeline. The average age of these accessions was 27.8 years, and 96 percent were male. The vast majority of the new accessions had no previous military experience because the average YOS and YOCS at the end of FY 1987 were 0.4 and 0.2 years, respectively. The ethnic mix of these accessions was 96 percent Caucasian, 3 percent black, and 1 percent Asian. More than 99 percent of the cohort were accessed as O-3s.

Upon completion of PGY-1 (intern) year, 72 percent of this cohort (155 individuals) were assigned to a PCMO tour in FY 1988. The remaining 28 percent (61 individuals) went directly into residency programs. Six years after accession (FY 1993), of the original 216 individuals in the cohort, 3.7 percent were still assigned as PCMOs, 35.6 percent were in residency programs, 42.1 percent had completed residency programs and were fully trained specialists, and 18.5 percent had attrited from the Navy. By FY 2000 (13 years after accession), 0.5 percent of this cohort were still PCMOs and had not completed a residency program, none were in residency programs, 27.8 percent had completed residency programs and were serving as fully trained specialists, and 71.8 percent had attrited from the Navy.

Of the original cohort, 171 individuals, or 79 percent, ultimately completed in-house residency programs and were fully trained specialists. By FY 2000, however, 111 of these individuals attrited from the Navy. Also, by this same time, 44 individuals, or 20 percent of the original cohort, attrited without entering or completing a residency program.

FY 1988 AFHPSP (direct) cohort

	FY88	FY89	FY90	FY91	FY92	FY93	FY94	FY95	FY96	FY97	FY98	FY99	FY00
Population	214	213	209	205	206	182	164	151	131	106	85	67	60
Attrition rate	0%	0%	2%	2%	0%	12%	10%	8%	13%	19%	20%	21%	10%
Cumulative attrition rate	0%	0%	2%	4%	4%	15%	23%	29%	39%	50%	60%	69%	72%
PCMOs	146	123	89	69	69	32	11	3	1	1			
PCMOs to population	69%	59%	43%	33%	33%	18%	7%	2%	1%	1%			
PCMOs to initial population	68%	57%	42%	32%	32%	15%	5%	1%	0%	0%			
Residents/fellows (R/F)	67	86	87	79	79	65	48	39	30	20	7	6	
R/F to population	31%	41%	42%	38%	38%	36%	29%	26%	23%	19%	8%	9%	
R/F to initial population	31%	40%	41%	37%	30%	22%	18%	14%	9%	3%	3%		
Specialists			29	58	85	85	105	109	100	85	78	61	60
Specialists to population			14%	28%	47%	47%	64%	72%	76%	80%	92%	91%	100%
Specialists to initial population			14%	27%	40%	40%	49%	51%	47%	40%	36%	29%	28%
Number Board certified (BC)			5	27	39	58	69	69	57	48	40	31	33
BC to specialists			17%	47%	46%	55%	55%	63%	57%	56%	51%	51%	55%
Number attrited							1	12	20	24	21	19	7
Attrition rate							1%	11%	18%	24%	25%	24%	11%
Cumulative no. of specialists			29	58	85	85	106	122	133	142	156	158	164
Cumulative no. attrited							1	13	33	57	78	97	104
Cumulative attrition rate							1%	11%	25%	40%	50%	61%	63%
No. attrited w/o R/F program*	1	4	4	4	-1	24	17	1	0	1	0	-1	0
Cumulative no. attrited	1	5	9	9	8	32	49	50	50	51	51	50	50
No. attrited to initial population	0%	2%	4%	4%	4%	15%	23%	23%	23%	24%	24%	23%	23%

* Negative attrition values are possible because some individuals may have left the Navy and returned in later years.

In FY 1988, the Navy accessed 214 physicians from the AFHPSP (direct) pipeline. The average age of these accessions was 27.7 years, and 94 percent were male. The vast majority of the new accessions had no previous military experience because the average YOS and YOCs at the end of FY 1988 were 0.6 and 0.4 years, respectively. The ethnic mix of these accessions was 92 percent Caucasian, 4 percent black, 2 percent Asian, and 2 percent other ethnicities. The entire cohort was accessed as O-3s.

Upon completion of PGY-1 (intern) year, 68 percent of this cohort (146 individuals) were assigned to a PCMO tour in FY 1989. Thirty-one percent (67 individuals) went directly into residency programs, and 1 individual attrited. Six years after accession (FY 1994), of the original 214 individuals in the cohort, 5.1 percent were still assigned as PCMOs, 22.4 percent were in residency programs, 49.1 percent had completed residency programs and were fully trained specialists, and 23.3 percent had attrited from the Navy. By FY 2000 (12 years after accession), 0 percent of this cohort were still PCMOs and had not completed a residency program, none were in residency programs, 28.0 percent had completed residency programs and were serving as fully trained specialists, and 72.0 percent had attrited from the Navy.

Of the original cohort, 164 individuals, or 77 percent, ultimately completed in-house residency programs and were fully trained specialists. By FY 2000, however, 104 of these individuals attrited from the Navy. Also, by this same time, 50 individuals, or 23 percent of the original cohort, attrited without entering or completing a residency program.

FY 1989 AFHPSP (direct) cohort

	FY89	FY90	FY91	FY92	FY93	FY94	FY95	FY96	FY97	FY98	FY99	FY00
Population	230	229	227	225	213	173	149	132	114	101	80	59
Attrition rate		0%	1%	1%	5%	19%	14%	11%	14%	11%	21%	26%
Cumulative attrition rate		0%	1%	2%	7%	25%	35%	43%	50%	56%	65%	74%
PCMOs	170	161	126	83	36	9	5	2	1			
PCMOs to population		74%	71%	56%	39%	21%	6%	4%	2%	1%		
PCMOs to initial population		74%	70%	55%	36%	16%	4%	2%	1%	0%		
Residents/fellows (R/F)	59	66	76	86	79	66	40	22	11	6	2	
R/F to population		26%	29%	34%	40%	46%	44%	30%	19%	11%	8%	3%
R/F to initial population		26%	29%	33%	37%	34%	29%	17%	10%	5%	3%	1%
Specialists				23	44	58	74	87	90	89	74	57
Specialists to population				10%	21%	34%	50%	66%	79%	88%	93%	97%
Specialists to initial population				10%	19%	25%	32%	38%	39%	39%	32%	25%
Number Board certified (BC)				5	19	25	30	38	40	33	27	22
BC to specialists				22%	43%	43%	41%	44%	44%	37%	36%	39%
Number attrited							3	14	17	12	20	21
Attrition rate							5%	19%	20%	13%	22%	28%
Cumulative no. of specialists				23	44	58	77	104	124	135	140	144
Cumulative no. attrited							3	17	34	46	66	87
Cumulative attrition rate							4%	16%	27%	34%	47%	60%
No. attrited w/o R/F program*	1	2	2	12	40	21	3	1	1	1	1	0
Cumulative no. attrited	1	3	5	17	57	78	81	82	83	84	84	84
No. attrited to initial population	0%	1%	2%	7%	25%	34%	35%	36%	36%	37%	37%	37%

* Negative attrition values are possible because some individuals may have left the Navy and returned in later years.

In FY 1989, the Navy accessed 230 physicians from the AFHPSP (direct) pipeline. The average age of these accessions was 27.6 years, and 81 percent were male. The vast majority of the new accessions had no previous military experience because the average YOS and YOCs at the end of FY 1989 were 0.6 and 0.2 years, respectively. The ethnic mix of these accessions was 94 percent Caucasian, 3 percent black, and 3 percent other ethnicities. The entire cohort was accessed as O-3s.

Upon completion of PGY-1 (intern) year, 74 percent of this cohort (170 individuals) were assigned to a PCMO tour in FY 1990. Twenty-six percent (59 individuals) went directly into residency programs, and 1 individual attrited. Six years after accession (FY 1995), of the original 230 individuals in the cohort, 3.9 percent were still assigned as PCMOs, 28.7 percent were in residency programs, 32.2 percent had completed residency programs and were fully trained specialists, and 35.2 percent had attrited from the Navy. By FY 2000 (11 years after accession), 0 percent of this cohort were still PCMOs and had not completed a residency program, 0.9 percent were in residency programs, 24.8 percent had completed residency programs and were serving as fully trained specialists, and 74.3 percent had attrited from the Navy.

Of the original cohort, 144 individuals, or 63 percent, ultimately completed in-house residency programs and were fully trained specialists. By FY 2000, however, 87 of these individuals attrited from the Navy. Also, by this same time, 84 individuals, or 37 percent of the original cohort, attrited without entering or completing a residency program.

FY 1990 AFHPSP (direct) cohort

	FY90	FY91	FY92	FY93	FY94	FY95	FY96	FY97	FY98	FY99	FY00
Population	248	246	244	243	238	190	164	149	135	118	97
Attrition rate	1%	1%	1%	0%	2%	20%	14%	9%	9%	13%	18%
Cumulative attrition rate	1%	1%	2%	2%	4%	23%	34%	40%	46%	52%	61%
PCMOs	184	169	136	136	100	43	16	10	5	2	2
PCMOs to population	75%	69%	56%	56%	42%	23%	10%	7%	4%	2%	2%
PCMOs to initial population	74%	68%	55%	55%	40%	17%	6%	4%	2%	1%	1%
Residents/fellows (R/F)	62	75	77	77	89	91	66	35	18	15	9
R/F to population	25%	31%	32%	32%	37%	48%	40%	23%	13%	13%	9%
R/F to initial population	25%	30%	31%	31%	36%	37%	27%	14%	7%	6%	4%
Specialists				30	49	56	82	104	112	101	86
Specialists to population				12%	21%	29%	50%	70%	83%	86%	89%
Specialists to initial population				12%	20%	23%	33%	42%	45%	41%	35%
Number Board certified (BC)				3	27	33	33	44	66	56	48
BC to specialists				10%	55%	59%	40%	42%	59%	55%	56%
Number attrited							3	12	13	17	21
Attrition rate							5%	15%	13%	15%	21%
Cumulative no. of specialists				30	49	56	85	119	140	146	152
Cumulative no. attrited							3	15	28	45	66
Cumulative attrition rate							4%	13%	20%	31%	43%
No. attrited w/o R/F program*	2	2	2	1	5	48	23	3	1	0	0
Cumulative no. attrited	2	4	4	5	10	58	81	84	85	85	85
No. attrited to initial population	1%	2%	2%	2%	4%	23%	33%	34%	34%	34%	34%

* Negative attrition values are possible because some individuals may have left the Navy and returned in later years.

In FY 1990, the Navy accessed 248 physicians from the AFHPSP (direct) pipeline. The average age of these accessions was 27.7 years, and 83 percent were male. The vast majority of the new accessions had no previous military experience because the average YOS and YOCS at the end of FY 1990 were 0.4 and 0.2 years, respectively. The ethnic mix of these accessions was 91 percent Caucasian, 2 percent black, 4 percent Asian, and 3 percent other ethnicities. The entire cohort was accessed as O-3s.

Upon completion of PGY-1 (intern) year, 74 percent of this cohort (184 individuals) were assigned to a PCMO tour in FY 1991. Twenty-five percent (62 individuals) went directly into residency programs, and 2 individuals attrited. Six years after accession (FY 1996), of the original 248 individuals in the cohort, 6.5 percent were still assigned as PCMOs, 26.6 percent were in residency programs, 33.1 percent had completed residency programs and were fully trained specialists, and 33.9 percent had attrited from the Navy. By FY 2000 (10 years after accession), 0.8 percent of this cohort were still PCMOs and had not completed a residency program, 3.6 percent were in residency programs, 34.7 percent had completed residency programs and were serving as fully trained specialists, and 60.9 percent had attrited from the Navy.

Of the original cohort, 152 individuals, or 61 percent, ultimately completed in-house residency programs and were fully trained specialists. By FY 2000, however, 66 of these individuals attrited from the Navy. Also, by this same time, 85 individuals, or 34 percent of the original cohort, attrited without entering or completing a residency program.

FY 1991 AFHPSP (direct) cohort

	FY91	FY92	FY93	FY94	FY95	FY96	FY97	FY98	FY99	FY00
Population	261	260	257	255	241	185	171	150	132	112
Attrition rate		0%	1%	1%	5%	23%	8%	12%	12%	15%
Cumulative attrition rate		0%	2%	2%	8%	29%	34%	43%	49%	57%
PCMOs		199	177	133	90	26	8	2	1	1
PCMOs to population		77%	69%	52%	37%	14%	5%	1%	1%	1%
PCMOs to initial population		76%	68%	51%	34%	10%	3%	1%	0%	0%
Residents/fellows (R/F)		61	80	82	88	93	74	32	15	14
R/F to population		23%	31%	32%	37%	50%	43%	21%	11%	13%
R/F to initial population		23%	31%	31%	34%	36%	28%	12%	6%	5%
Specialists				40	63	66	89	116	116	97
Specialists to population				16%	26%	36%	52%	77%	88%	87%
Specialists to initial population				15%	24%	25%	34%	44%	44%	37%
Number Board certified (BC)				2	28	33	39	66	61	58
BC to specialists				5%	44%	50%	44%	57%	53%	60%
Number attrited							2	13	17	20
Attrition rate							3%	15%	15%	17%
Cumulative no. of specialists				40	63	66	91	131	148	149
Cumulative no. attrited							2	15	32	52
Cumulative attrition rate							2%	11%	22%	35%
No. attrited w/o R/F program*	1	3	2	2	14	56	12	8	1	0
Cumulative no. attrited	1	4	6	6	20	76	88	96	97	97
No. attrited to initial population	0%	2%	2%	2%	8%	29%	34%	37%	37%	37%

* Negative attrition values are possible because some individuals may have left the Navy and returned in later years.

In FY 1991, the Navy accessed 261 physicians from the AFHPSP (direct) pipeline. The average age of these accessions was 27.9 years, and 82 percent were male. The vast majority of the new accessions had no previous military experience because the average YOS and YOCs at the end of FY 1991 were 0.3 and 0.1 years, respectively. The ethnic mix of these accessions was 95 percent Caucasian, 2 percent black, 3 percent Asian, and 1 percent other ethnicities. The entire cohort was accessed as O-3s.

Upon completion of PGY-1 (intern) year, 76 percent of this cohort (199 individuals) were assigned to a PCMO tour in FY 1992. Twenty-three percent (61 individuals) went directly into residency programs, and 1 individual attrited. Six years after accession (FY 1997), of the original 261 individuals in the cohort, 3.1 percent were still assigned as PCMOs, 28.4 percent were in residency programs, 34.1 percent had completed residency programs and were fully trained specialists, and 34.5 percent had attrited from the Navy. By FY 2000 (9 years after accession), 0.4 percent of this cohort were still PCMOs and had not completed a residency program, 5.4 percent were in residency programs, 37.2 percent had completed residency programs and were serving as fully trained specialists, and 57.1 percent had attrited from the Navy.

Of the original cohort, 149 individuals, or 57 percent, ultimately completed in-house residency programs and were fully trained specialists. By FY 2000, however, 52 of these individuals attrited from the Navy. Also, by this same time, 97 individuals, or 37 percent of the original cohort, attrited without entering or completing a residency program.

FY 1992 AFHPSP (direct) cohort

	FY92	FY93	FY94	FY95	FY96	FY97	FY98	FY99	FY00
Population	254	253	252	251	242	209	170	157	133
Attrition rate	0%	0%	0%	0%	4%	14%	19%	8%	15%
Cumulative attrition rate	0%	0%	1%	1%	5%	18%	33%	38%	48%
PCMOs	189	177	141	95	55	12	5	2	
PCMOs to population	75%	70%	56%	39%	26%	7%	3%	2%	
PCMOs to initial population	74%	70%	56%	37%	22%	5%	2%	1%	
Residents/fellows (R/F)	64	75	64	83	85	68	36	17	
R/F to population	25%	30%	25%	34%	41%	40%	23%	13%	
R/F to initial population	25%	30%	25%	33%	33%	27%	14%	7%	
Specialists				46	64	69	90	116	114
Specialists to population				18%	26%	33%	53%	74%	86%
Specialists to initial population				18%	25%	27%	35%	46%	45%
Number Board certified (BC)				5	36	43	52	60	58
BC to specialists				11%	56%	62%	58%	52%	51%
Number attrited							2	10	22
Attrition rate							3%	11%	19%
Cumulative no. of specialists				46	64	69	92	128	148
Cumulative no. attrited							2	12	34
Cumulative attrition rate							2%	9%	23%
No. attrited w/o R/F program*	1	1	1	1	9	33	37	3	2
Cumulative no. attrited	1	2	3	3	12	45	82	85	87
No. attrited to initial population	0%	1%	1%	1%	5%	18%	32%	33%	34%

* Negative attrition values are possible because some individuals may have left the Navy and returned in later years.

In FY 1992, the Navy accessed 254 physicians from the AFHPSP (direct) pipeline. The average age of these accessions was 27.6 years, and 77 percent were male. The vast majority of the new accessions had no previous military experience because the average YOS and YOCs at the end of FY 1992 were 0.4 and 0.1 years, respectively. The ethnic mix of these accessions was 94 percent Caucasian, 3 percent black, 3 percent Asian, and 1 percent other ethnicities. The entire cohort was accessed as O-3s.

Upon completion of PCY-1 (intern) year, 74 percent of this cohort (189 individuals) were assigned to a PCMO tour in FY 1993. Twenty-five percent (64 individuals) went directly into residency programs, and 1 individual attrited. Six years after accession (FY 1998), of the original 254 individuals in the cohort, 4.7 percent were still assigned as PCMOs, 26.8 percent were in residency programs, 35.4 percent had completed residency programs and were fully trained specialists, and 33.1 percent had attrited from the Navy. By FY 2000 (8 years after accession), 0.8 percent of this cohort were still PCMOs and had not completed a residency program, 6.7 percent were in residency programs, 44.9 percent had completed residency programs and were serving as fully trained specialists, and 47.6 percent had attrited from the Navy.

Of the original cohort, 148 individuals, or 58 percent, ultimately completed in-house residency programs and were fully trained specialists. By FY 2000, however, 34 of these individuals attrited from the Navy. Also, by this same time, 87 individuals, or 34 percent of the original cohort, attrited without entering or completing a residency program.

FY 1993 AFHPSP (direct) cohort

	FY93	FY94	FY95	FY96	FY97	FY98	FY99	FY00
Population	272	272	271	268	262	222	193	177
Attrition rate	0%	0%	0%	1%	2%	15%	13%	8%
Cumulative attrition rate	0%	0%	0%	1%	4%	18%	29%	35%
PCMOs	173	168	133	90	47	12	6	
PCMOs to population	64%	62%	50%	34%	21%	6%	3%	
PCMOs to initial population	64%	62%	49%	33%	17%	4%	2%	
Residents/fellows (R/F)	99	103	69	90	77	59	37	
R/F to population	36%	38%	26%	34%	35%	31%	21%	
R/F to initial population	36%	38%	25%	33%	28%	22%	14%	
Specialists			66	82	98	122	134	
Specialists to population			25%	31%	44%	63%	76%	
Specialists to initial population			24%	30%	36%	45%	49%	
Number Board certified (BC)			15	57	65	74	87	
BC to specialists			23%	70%	66%	61%	65%	
Number attrited						1	11	
Attrition rate						1%	9%	
Cumulative no. of specialists				66	82	98	123	146
Cumulative no. attrited							1	12
Cumulative attrition rate						1%	8%	
No. attrited w/o R/F program*			1	3	6	40	28	5
Cumulative no. attrited			1	4	10	50	78	83
No. attrited to initial population			0%	1%	4%	18%	29%	31%

* Negative attrition values are possible because some individuals may have left the Navy and returned in later years.

In FY 1993, the Navy accessed 272 physicians from the AFHPSP (direct) pipeline. The average age of these accessions was 27.7 years, and 70 percent were male. The vast majority of the new accessions had no previous military experience because the average YOS and YOCs at the end of FY 1993 were 0.4 and 0.2 years, respectively. The ethnic mix of these accessions was 89 percent Caucasian, 3 percent black, 6 percent Asian, and 2 percent other ethnicities. Ninety-nine percent of the cohort were accessed as O-3s.

Upon completion of PGY-1 (intern) year, 64 percent of this cohort (173 individuals) were assigned to a PCMO tour in FY 1994. The remaining 36 percent (99 individuals) went directly into residency programs. Six years after accession (FY 1999), of the original 272 individuals in the cohort, 4.4 percent were still assigned as PCMOs, 21.7 percent were in residency programs, 44.9 percent had completed residency programs and were fully trained specialists, and 29.0 percent had attrited from the Navy. By FY 2000 (7 years after accession), 2.2 percent of this cohort were still PCMOs and had not completed a residency program, 13.6 percent were in residency programs, 49.3 percent had completed residency programs and were serving as fully trained specialists, and 34.9 percent had attrited from the Navy.

Of the original cohort, 146 individuals, or 54 percent, ultimately completed in-house residency programs and were fully trained specialists. By FY 2000, however, 12 of these individuals attrited from the Navy. Also, by this same time, 83 individuals, or 31 percent of the original cohort, attrited without entering or completing a residency program.

FY 1994 AFHPSP (direct) cohort

	FY94	FY95	FY96	FY97	FY98	FY99	FY00
Population	258	258	254	251	246	215	186
Attrition rate		0%	2%	1%	2%	13%	13%
Cumulative attrition rate		0%	2%	3%	5%	17%	28%
PCMOs		183	172	136	97	50	18
PCMOs to population		71%	68%	54%	39%	23%	10%
PCMOs to initial population		71%	67%	53%	38%	19%	7%
Residents/fellows (R/F)		75	82	64	80	78	55
R/F to population		29%	32%	25%	33%	36%	30%
R/F to initial population		29%	32%	25%	31%	30%	21%
Specialists				51	69	87	113
Specialists to population				20%	28%	40%	61%
Specialists to initial population				20%	27%	34%	44%
Number Board certified (BC)				12	46	49	56
BC to specialists				24%	67%	56%	50%
Number attrited							1
Attrition rate							1%
Cumulative no. of specialists				51	69	87	114
Cumulative no. attrited							1
Cumulative attrition rate							1%
No. attrited w/o R/F program*			4	3	5	31	28
Cumulative no. attrited			4	7	12	43	71
No. attrited to initial population			2%	3%	5%	17%	28%

* Negative attrition values are possible because some individuals may have left the Navy and returned in later years.

In FY 1994, the Navy accessed 258 physicians from the AFHPSP (direct) pipeline. The average age of these accessions was 27.9 years, and 72 percent were male. The vast majority of the new accessions had no previous military experience because the average YOS and YOCS at the end of FY 1994 were 0.4 and 0.2 years, respectively. The ethnic mix of these accessions was 88 percent Caucasian, 4 percent black, 5 percent Asian, and 3 percent other ethnicities. More than 99 percent of the cohort were accessed as O-3s.

Upon completion of PCY-1 (intern) year, 71 percent of this cohort (183 individuals) were assigned to a PCMO tour in FY 1995. The remaining 29 percent (75 individuals) went directly into residency programs. Six years after accession (FY 2000), of the original 258 individuals in the cohort, 7.0 percent were still assigned as PCMOs, 21.3 percent were in residency programs, 43.8 percent had completed residency programs and were fully trained specialists, and 27.9 percent had attrited from the Navy.

FY 1995 AFHPSP (direct) cohort

	FY95	FY96	FY97	FY98	FY99	FY00
Population	242	241	241	238	233	207
Attrition rate		0%	0%	1%	2%	11%
Cumulative attrition rate		0%	0%	2%	4%	14%
PCMOs	177	165	131	102	64	
PCMOs to population	73%	68%	55%	44%	31%	
PCMOs to initial population	73%	68%	54%	42%	26%	
Residents/fellows (R/F)	64	76	72	72	63	
R/F to population	27%	32%	30%	31%	30%	
R/F to initial population	26%	31%	30%	30%	26%	
Specialists			35	59	80	
Specialists to population			15%	25%	39%	
Specialists to initial population			14%	24%	33%	
Number Board certified (BC)			9	27	39	
BC to specialists			26%	46%	49%	
Number attrited						
Attrition rate						
Cumulative no. of specialists			35	59	80	
Cumulative no. attrited						
Cumulative attrition rate						

No. attrited w/o R/F program*	1	0	3	5	26
Cumulative no. attrited	1	1	4	9	35
No. attrited to initial population	0%	0%	2%	4%	14%

* Negative attrition values are possible because some individuals may have left the Navy and returned in later years.

In FY 1995, the Navy accessed 242 physicians from the AFHPSP (direct) pipeline. The average age of these accessions was 28.0 years, and 72 percent were male. The vast majority of the new accessions had no previous military experience because the average YOS and YOCS at the end of FY 1995 were 0.5 and 0.3 years, respectively. The ethnic mix of these accessions was 89 percent Caucasian, 4 percent black, 3 percent Asian, and 3 percent other ethnicities. Ninety-eight percent of the cohort were accessed as O-3s.

Upon completion of PGY-1 (intern) year, 73 percent of this cohort (177 individuals) were assigned to a PCMO tour in FY 1996. Twenty-six percent (64 individuals) went directly into residency programs and 1 individual attrited. By FY 2000 (five years after accession), 26.4 percent were still assigned as PCMOs, 26.0 percent were in residency programs, 33.1 percent had completed residency programs and were fully trained specialists, and 14.5 percent had attrited from the Navy.

FY 1996 AFHPSP (direct) cohort

	FY96	FY97	FY98	FY99	FY00
Population	190	189	188	186	185
Attrition rate		1%	1%	1%	1%
Cumulative attrition rate		1%	1%	2%	3%
PCMOs	150	143	106	79	
PCMOs to population	79%	76%	57%	43%	
PCMOs to initial population	79%	75%	56%	42%	
Residents/fellows (R/F)	39	45	59	69	
R/F to population	21%	24%	32%	37%	
R/F to initial population	21%	24%	31%	36%	
Specialists			21	37	
Specialists to population			11%	20%	
Specialists to initial population			11%	19%	
Number Board certified (BC)			1	19	
BC to specialists			5%	51%	
Number attrited					
Attrition rate					
Cumulative no. of specialists			21	37	
Cumulative no. attrited					
Cumulative attrition rate					
No. attrited w/o R/F program*	1	1	2	1	
Cumulative no. attrited	1	2	4	5	
No. attrited to initial population	1%	1%	2%	3%	

* Negative attrition values are possible because some individuals may have left the Navy and returned in later years.

In FY 1996, the Navy accessed 190 physicians from the AFHPSP (direct) pipeline. The average age of these accessions was 28.7 years, and 76 percent were male. The vast majority of the new accessions had no previous military experience because the average YOS and YOCS at the end of FY 1996 were 0.8 and 0.6 years, respectively. The ethnic mix of these accessions was 91 percent Caucasian, 2 percent black, 5 percent Asian, and 2 percent other ethnicities. Ninety-eight percent of the cohort were accessed as O-3s.

Upon completion of PGY-1 (intern) year, 79 percent of this cohort (150 individuals) were assigned to a PCMO tour in FY 1997. Twenty-one percent (39 individuals) went directly into residency programs, and 1 individual attrited. By FY 2000 (four years after accession), 41.6 percent were still assigned as PCMOs, 36.3 percent were in residency programs, 19.5 percent had completed residency programs and were fully trained specialists, and 2.6 percent had attrited from the Navy.

FY 1997 AFHPSP (direct) cohort

	FY97	FY98	FY99	FY00
Population	209	209	209	209
Attrition rate		0%	0%	0%
Cumulative attrition rate		0%	0%	0%
PCMOs		159	152	116
PCMOs to population		76%	73%	56%
PCMOs to initial population		76%	73%	56%
Residents/fellows (R/F)		50	57	61
R/F to population		24%	27%	29%
R/F to initial population		24%	27%	29%
Specialists				32
Specialists to population				15%
Specialists to initial population				15%
Number Board certified (BC)				11
BC to specialists				34%
Number attrited				
Attrition rate				
Cumulative no. of specialists				32
Cumulative no. attrited				
Cumulative attrition rate				
No. attrited w/o R/F program*				
Cumulative no. attrited				
No. attrited to initial population				

* Negative attrition values are possible because some individuals may have left the Navy and returned in later years.

In FY 1997, the Navy accessed 209 physicians from the AFHPSP (direct) pipeline. The average age of these accessions was 28.1 years, and 69 percent were male. The vast majority of the new accessions had no previous military experience because the average YOS and YOCS at the end of FY 1997 were 0.7 and 0.4 years, respectively. The ethnic mix of these accessions was 83 percent Caucasian, 6 percent black, 8 percent Asian, and 3 percent other ethnicities. Ninety-nine percent of the cohort were accessed as O-3s.

Upon completion of PGY-1 (intern) year, 76 percent of this cohort (159 individuals) were assigned to a PCMO tour in FY 1998. The remaining 24 percent (50 individuals) went directly into residency programs. By FY 2000 (three years after accession), 55.5 percent were still assigned as PCMOs, 29.2 percent were in residency programs, 15.3 percent had completed residency programs and were fully trained specialists, and none had attrited from the Navy.

Appendix C: USUHS cohort analysis

FY 1987 USUHS cohort

	FY87	FY88	FY89	FY90	FY91	FY92	FY93	FY94	FY95	FY96	FY97	FY98	FY99	FY00
Population	41	41	41	40	39	39	39	39	39	39	39	35	29	25
Attrition rate		0%	0%	2%	3%	0%	0%	0%	0%	0%	0%	10%	17%	14%
Cumulative attrition rate		0%	0%	2%	5%	5%	5%	5%	5%	5%	5%	15%	29%	39%
PCMOs		23	21	9	3	1								
PCMOs to population		56%	51%	23%	8%	3%								
PCMOs to initial population		56%	51%	22%	7%	2%								
Residents/fellows (R/F)		18	20	27	24	22	19	14	5	4			3	1
R/F to population		44%	49%	68%	62%	56%	49%	36%	13%	10%			10%	4%
R/F to initial population		44%	49%	66%	59%	54%	46%	34%	12%	10%			7%	2%
Specialists				4	12	16	20	25	34	35	39	35	26	24
Specialists to population				10%	31%	41%	51%	64%	87%	90%	100%	100%	90%	96%
Specialists to initial population				10%	29%	39%	49%	61%	83%	85%	95%	85%	63%	59%
Number board certified (BC)					3	9	15	16	19	26	29	27	18	14
BC to specialists					25%	56%	75%	64%	56%	74%	74%	77%	69%	58%
Number attrited												4	6	4
Attrition rate												10%	17%	15%
Cumulative no. of specialists				4	12	16	20	25	34	35	39	39	36	38
Cumulative no. attrited												4	10	14
Cumulative attrition rate												10%	28%	37%
No. attrited w/o R/F program*				1	1	0	0	0	0	0	0	0	0	0
Cumulative no. attrited				1	2	2	2	2	2	2	2	2	2	2
No. attrited to initial population				2%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%

In FY 1987, the Navy accessed 41 physicians from the USUHS pipeline. The average age of these accessions was 28.3 years, and 88 percent were male.

Many of the new accessions had previous military experience because the average YOS and YOCS at the end of FY 1987 was 1.9 years for both. The ethnic mix of these accessions was 100 percent Caucasian. The entire cohort was accessed as O-3s.

Upon completion of PGY-1 (intern) year, 56 percent of this cohort (23 individuals) were assigned to a PCMO tour in FY 1988. The remaining 44 percent (18 individuals) went directly into residency programs. Of the original 41 individuals in the cohort, 0 percent were still assigned as PCMOs, 46.3 percent were in residency programs, 48.8 percent had completed residency programs and were fully trained specialists, and 4.9 percent had attrited from the Navy six years after accession (by FY 1993). By FY 2000 (13 years after accession), 0 percent of this cohort were still PCMOs and had not completed a residency program, 2.4 percent were in residency programs, 58.5 percent had completed residency programs and were serving as fully trained specialists, and 39.0 percent had attrited from the Navy.

Of the original cohort, 38 individuals, or 93 percent, ultimately completed in-house residency programs and were fully trained specialists. By FY 2000, however, 14 of these individuals attrited from the Navy. Also, by this same time, 2 individuals, or 5 percent of the original cohort, attrited without entering or completing a residency program.

FY 1988 USUHS cohort

	FY88	FY89	FY90	FY91	FY92	FY93	FY94	FY95	FY96	FY97	FY98	FY99	FY00
Population	35	35	35	35	35	35	35	35	35	34	34	33	31
Attrition rate		0%	0%	0%	0%	0%	0%	0%	0%	3%	0%	3%	6%
Cumulative attrition rate		0%	0%	0%	0%	0%	0%	0%	0%	3%	3%	6%	11%
PCMOs		27	22	13	8	5	3	2	2				
PCMOs to population		77%	63%	37%	23%	14%	9%	6%	6%				
PCMOs to initial population		77%	63%	37%	23%	14%	9%	6%	6%				
Residents/fellows (R/F)		8	13	20	22	20	17	13	4	5	2	2	
R/F to population		23%	37%	57%	63%	57%	49%	37%	11%	15%	6%	6%	
R/F to initial population		23%	37%	57%	63%	57%	49%	37%	11%	14%	6%	6%	
Specialists													
Specialists to population				2	5	10	15	20	29	29	32	31	31
Specialists to initial population				6%	14%	29%	43%	57%	83%	85%	94%	94%	100%
Number board certified (BC)				6%	14%	29%	43%	57%	83%	83%	91%	89%	89%
BC to specialists					1	3	5	10	16	21	22	22	21
Number attrited					20%	30%	33%	50%	55%	72%	69%	71%	68%
Attrition rate												1	2
Cumulative no. of specialists				2	5	10	15	20	29	29	32	32	34
Cumulative no. attrited												1	3
Cumulative attrition rate												3%	9%
No. attrited w/o R/F program*										1	0	0	0
Cumulative no. attrited										1	1	1	1
No. attrited to initial population										3%	3%	3%	3%

In FY 1988, the Navy accessed 35 physicians from the USUHS pipeline. The average age of these accessions was 28.5 years, and 94 percent were male.

Many of the new accessions had previous military experience because the average YOS and YOCs at the end of FY 1988 were 1.8 and 1.3 years, respectively. The ethnic mix of these accessions was 89 percent Caucasian, 0 percent black, 6 percent Asian, and 6 percent other ethnicities. The entire cohort was accessed as O-3s.

Upon completion of PGY-1 (intern) year, 77 percent of this cohort (27 individuals) were assigned to a PCMO tour in FY 1989. The remaining 23 percent (8 individuals) went directly into residency programs. Six years after accession (FY 1994), of the original 35 individuals in the cohort, 8.6 percent were still assigned as PCMOs, 48.6 percent were in residency programs, 42.9 percent had completed residency programs and were fully trained specialists, and none had attrited from the Navy. By FY 2000 (12 years after accession), 0 percent of this cohort were still PCMOs and had not completed a residency program, none were in residency programs, 88.6 percent had completed residency programs and were serving as fully trained specialists, and 11.4 percent had attrited from the Navy.

Of the original cohort, 34 individuals, or 97 percent, ultimately completed in-house residency programs and were fully trained specialists. By FY 2000, however, 3 of these individuals attrited from the Navy. Also, by this same time, 1 individual, or 3 percent of the original cohort, attrited without entering or completing a residency program.

FY 1989 USUHS cohort

	FY89	FY90	FY91	FY92	FY93	FY94	FY95	FY96	FY97	FY98	FY99	FY00
Population	43	43	43	43	43	43	41	41	41	40	40	39
Attrition rate		0%	0%	0%	0%	0%	5%	0%	0%	2%	0%	3%
Cumulative attrition rate		0%	0%	0%	0%	0%	5%	5%	5%	7%	7%	9%
PCMOs		25	22	14	7	6	4	4	3	2	1	1
PCMOs to population		58%	51%	33%	16%	14%	10%	10%	7%	5%	3%	3%
PCMOs to initial population		58%	51%	33%	16%	14%	9%	9%	7%	5%	2%	2%
Residents/fellows (R/F)		18	21	24	21	20	18	10	2	5	2	2
R/F to population		42%	49%	56%	49%	47%	44%	24%	5%	13%	5%	5%
R/F to initial population		42%	49%	56%	49%	47%	42%	23%	5%	12%	5%	5%
Specialists				5	15	17	19	27	36	33	37	36
Specialists to population				12%	35%	40%	46%	66%	88%	83%	93%	92%
Specialists to initial population				12%	35%	40%	44%	63%	84%	77%	86%	84%
Number board certified (BC)					7	9	11	13	21	24	28	29
BC to specialists					47%	53%	58%	48%	58%	73%	76%	81%
Number attrited							1					1
Attrition rate							6%					3%
Cumulative no. of specialists				5	15	17	20	28	37	34	38	38
Cumulative no. attrited							1	1	1	1	1	2
Cumulative attrition rate							5%	4%	3%	3%	3%	5%
No. attrited w/o R/F program*							1	0	0	1	0	0
Cumulative no. attrited							1	1	1	2	2	2
No. attrited to initial population							2%	2%	2%	5%	5%	5%

In FY 1989, the Navy accessed 43 physicians from the USUHS pipeline. The average age of these accessions was 29.1 years, and 74 percent were male. Many of the new accessions had previous military experience because the average YOS and YOCs at the end of FY 1989 were 1.7 and 1.3 years, respectively. The ethnic mix of these accessions was 98 percent Caucasian, 2 percent black, and 0 percent Asian or other ethnicities. The entire cohort was accessed as O-3s.

Upon completion of PGY-1 (intern) year, 58 percent of this cohort (25 individuals) were assigned to a PCMO tour in FY 1990. The remaining 42 percent (18 individuals) went directly into residency programs. Six years after accession (FY 1995), of the original 43 individuals in the cohort, 9.3 percent were still assigned as PCMOs, 41.9 percent were in residency programs, 44.2 percent had completed residency programs and were fully trained specialists, and 4.7 percent had attrited from the Navy. By FY 2000 (11 years after accession), 2.3 percent of this cohort were still PCMOs and had not completed a residency program, 4.7 percent were in residency programs, 83.7 percent had completed residency programs and were serving as fully trained specialists, and 9.3 percent had attrited from the Navy.

Of the original cohort, 38 individuals, or 88 percent, ultimately completed in-house residency programs and were fully trained specialists. By FY 2000, however, 2 of these individuals attrited from the Navy. Also, by this same time, 2 individuals, or 5 percent of the original cohort, attrited without entering or completing a residency program.

FY 1990 USUHS cohort

	FY90	FY91	FY92	FY93	FY94	FY95	FY96	FY97	FY98	FY99	FY00
Population	45	45	45	45	45	45	44	44	43	42	42
Attrition rate		0%	0%	0%	0%	0%	2%	0%	2%	2%	0%
Cumulative attrition rate		0%	0%	0%	0%	0%	2%	2%	4%	7%	7%
PCMOs	37	33	33	23	13	7	2	1	1		
PCMOs to population	82%	73%	73%	51%	29%	16%	5%	2%	2%		
PCMOs to initial population	82%	73%	73%	51%	29%	16%	4%	2%	2%		
Residents/fellows (R/F)	8	12	21	21	24	27	26	15	5	4	4
R/F to population	18%	27%	47%	53%	53%	60%	59%	34%	12%	10%	10%
R/F to initial population	18%	27%	47%	53%	53%	60%	58%	33%	11%	9%	9%
Specialists				1	8	11	16	28	37	38	38
Specialists to population				2%	18%	24%	36%	64%	86%	90%	90%
Specialists to initial population				2%	18%	24%	36%	62%	82%	84%	84%
Number board certified (BC)					1	1	5	13	20	28	30
BC to specialists					13%	9%	31%	46%	54%	74%	79%
Number attrited									1		
Attrition rate									4%		
Cumulative no. of specialists				1	8	11	16	28	38	39	39
Cumulative no. attrited									1	1	1
Cumulative attrition rate									3%	3%	3%
No. attrited w/o R/F program*							1	0	0	1	0
Cumulative no. attrited							1	1	1	2	2
No. attrited to initial population							2%	2%	2%	4%	4%

In FY 1990, the Navy accessed 45 physicians from the USUHS pipeline. The average age of these accessions was 27.6 years, and 71 percent were male. The majority of the new accessions had no previous military experience because the average YOS and YOCS at the end of FY 1990 were 0.7 and 0.3 years, respectively. The ethnic mix of these accessions was 91 percent Caucasian, 0 percent black, 7 percent Asian, and 2 percent other ethnicities. The entire cohort was accessed as O-3s.

Upon completion of PGY-1 (intern) year, 82 percent of this cohort (37 individuals) were assigned to a PCMO tour in FY 1991. The remaining 18 percent (8 individuals) went directly into residency programs. Six years after accession (FY 1996), of the original 45 individuals in the cohort, 4.4 percent were still assigned as PCMOs, 57.8 percent were in residency programs, 35.6 percent had completed residency programs and were fully trained specialists, and 2.2 percent had attrited from the Navy. By FY 2000 (10 years after accession), 0 percent of this cohort were still PCMOs and had not completed a residency program, 8.9 percent were in residency programs, 84.4 percent had completed residency programs and were serving as fully trained specialists, and 6.7 percent had attrited from the Navy.

Of the original cohort, 39 individuals, or 87 percent, ultimately completed in-house residency programs and were fully trained specialists. By FY 2000, however, 1 of these individuals attrited from the Navy. Also, by this same time, 2 individuals, or 4 percent of the original cohort, attrited without entering or completing a residency program.

FY 1991 USUHS cohort

	FY91	FY92	FY93	FY94	FY95	FY96	FY97	FY98	FY99	FY00
Population	44	44	44	44	44	44	44	43	42	41
Attrition rate		0%	0%	0%	0%	0%	0%	2%	2%	2%
Cumulative attrition rate		0%	0%	0%	0%	0%	0%	2%	5%	7%
PCMOs		37	35	28	12	10	6	5	4	3
PCMOs to population		84%	80%	64%	27%	23%	14%	12%	10%	7%
PCMOs to initial population		84%	80%	64%	27%	23%	14%	11%	9%	7%
Residents/fellows (R/F)		7	9	11	26	26	20	15	6	5
R/F to population		16%	20%	25%	59%	59%	45%	35%	14%	12%
R/F to initial population		16%	20%	25%	59%	59%	45%	34%	14%	11%
Specialists				5	6	8	18	23	32	33
Specialists to population				11%	14%	18%	41%	53%	76%	80%
Specialists to initial population				11%	14%	18%	41%	52%	73%	75%
Number board certified (BC)					5	4	9	14	15	22
BC to specialists					83%	50%	50%	61%	47%	67%
Number attrited								1		
Attrition rate								6%		
Cumulative no. of specialists				5	6	8	18	24	33	34
Cumulative no. attrited								1	1	1
Cumulative attrition rate								4%	3%	3%
No. attrited w/o R/F program*									1	1
Cumulative no. attrited									1	2
No. attrited to initial population									2%	5%

In FY 1991, the Navy accessed 44 physicians from the USUHS pipeline. The average age of these accessions was 28.5 years, and 84 percent were male. Some of the new accessions had previous military experience because the average YOS and YOCS at the end of FY 1991 were 1.3 and 0.6 years, respectively. The ethnic mix of these accessions was 98 percent Caucasian, 0 percent black, 2 percent Asian, and 0 percent other ethnicities. The entire cohort was accessed as O-3s.

Upon completion of PGY-1 (intern) year, 84 percent of this cohort (37 individuals) were assigned to a PCMO tour in FY 1992. The remaining 16 percent (7 individuals) went directly into residency programs. Six years after accession (FY 1997), of the original 44 individuals in the cohort, 13.6 percent were still assigned as PCMOs, 45.5 percent were in residency programs, 40.9 percent had completed residency programs and were fully trained specialists, and none had attrited from the Navy. By FY 2000 (9 years after accession), 6.8 percent of this cohort were still PCMOs and had not completed a residency program, 11.4 percent were in residency programs, 75.0 percent had completed residency programs and were serving as fully trained specialists, and 6.8 percent had attrited from the Navy.

Of the original cohort, 34 individuals, or 77 percent, ultimately completed in-house residency programs and were fully trained specialists. By FY 2000, however, 1 of these individuals attrited from the Navy. Also, by this same time, 2 individuals, or 5 percent of the original cohort, attrited without entering or completing a residency program.

FY 1992 USUHS cohort

	FY92	FY93	FY94	FY95	FY96	FY97	FY98	FY99	FY00
Population	55	55	54	54	54	54	54	54	54
Attrition rate		0%	2%	0%	0%	0%	0%	0%	0%
Cumulative attrition rate		0%	2%	2%	2%	2%	2%	2%	2%
PCMOs	41	39	31	17	9	9	9	3	3
PCMOs to population	75%	72%	57%	31%	17%	17%	17%	6%	6%
PCMOs to initial population	75%	71%	56%	31%	16%	16%	16%	5%	5%
Residents/fellows (R/F)	14	15	15	26	29	26	18	15	15
R/F to population	25%	28%	28%	48%	54%	48%	33%	28%	28%
R/F to initial population	25%	27%	27%	47%	53%	47%	33%	27%	27%
Specialists				8	11	16	19	33	36
Specialists to population				15%	20%	30%	35%	61%	67%
Specialists to initial population				15%	20%	29%	35%	60%	65%
Number board certified (BC)					6	10	15	18	20
BC to specialists					55%	63%	79%	55%	56%
Number attrited									
Attrition rate									
Cumulative no. of specialists				8	11	16	19	33	36
Cumulative no. attrited									
Cumulative attrition rate									

No. attrited w/o R/F program*	1	0	0	0	0	0	0	0	0
Cumulative no. attrited	1	1	1	1	1	1	1	1	1
No. attrited to initial population	2%	2%	2%	2%	2%	2%	2%	2%	2%

In FY 1992, the Navy accessed 55 physicians from the USUHS pipeline. The average age of these accessions was 28.0 years, and 75 percent were male. The majority of the new accessions had no previous military experience because the average YOS and YOCs at the end of FY 1992 were 0.7 and 0.6 years, respectively. The ethnic mix of these accessions was 94 percent Caucasian, 2 percent black, 4 percent Asian, and 0 percent other ethnicities. The entire cohort was accessed as O-3s.

Upon completion of PGY-1 (intern) year, 75 percent of this cohort (41 individuals) were assigned to a PCMO tour in FY 1993. The remaining 25 percent (14 individuals) went directly into residency programs. Six years after accession (FY 1998), of the original 55 individuals in the cohort, 16.4 percent were still assigned as PCMOs, 47.3 percent were in residency programs, 34.5 percent had completed residency programs and were fully trained specialists, and 1.8 percent had attrited from the Navy. By FY 2000 (8 years after accession), 5.5 percent of this cohort were still PCMOs and had not completed a residency program, 27.3 percent were in residency programs, 65.5 percent had completed residency programs and were serving as fully trained specialists, and 1.8 percent had attrited from the Navy.

Of the original cohort, 36 individuals, or 65 percent, ultimately completed in-house residency programs and were fully trained specialists. By FY 2000, all of these individuals were still in the Navy. Also, by this same time, 1 individual, or 2 percent of the original cohort, attrited without entering or completing a residency program.

FY 1993 USUHS cohort

	FY93	FY94	FY95	FY96	FY97	FY98	FY99	FY00
Population	46	46	46	44	44	44	44	44
Attrition rate		0%	0%	4%	0%	0%	0%	0%
Cumulative attrition rate		0%	0%	4%	4%	4%	4%	4%
PCMOs		35	31	25	15	7	5	5
PCMOs to population		76%	67%	57%	34%	16%	11%	11%
PCMOs to initial population		76%	67%	54%	33%	15%	11%	11%
Residents/fellows (R/F)		11	15	14	20	29	28	21
R/F to population		24%	33%	32%	45%	66%	64%	48%
R/F to initial population		24%	33%	30%	43%	63%	61%	46%
Specialists				5	9	8	11	18
Specialists to population				11%	20%	18%	25%	41%
Specialists to initial population				11%	20%	17%	24%	39%
Number board certified (BC)					5	5	6	6
BC to specialists					56%	63%	55%	33%
Number attrited								
Attrition rate								
Cumulative no. of specialists				5	9	8	11	18
Cumulative no. attrited								
Cumulative attrition rate								
No. attrited w/o R/F program*				2	0	0	0	0
Cumulative no. attrited				2	2	2	2	2
No. attrited to initial population				4%	4%	4%	4%	4%

In FY 1993, the Navy accessed 46 physicians from the USUHS pipeline. The average age of these accessions was 28.6 years, and 78 percent were male. Many of the new accessions had previous military experience because the average YOS and YOCs at the end of FY 1993 were 1.6 and 1.0 years, respectively. The ethnic mix of these accessions was 98 percent Caucasian, 0 percent black, 0 percent Asian, and 2 percent other ethnicities. The entire cohort was accessed as O-3s.

Upon completion of PGY-1 (intern) year, 76 percent of this cohort (35 individuals) were assigned to a PCMO tour in FY 1994. The remaining 24 percent (11 individuals) went directly into residency programs. Six years after accession (FY 1999), of the original 46 individuals in the cohort, 10.9 percent were still assigned as PCMOs, 60.9 percent were in residency programs, 23.9 percent had completed residency programs and were fully trained specialists, and 4.3 percent had attrited from the Navy. By FY 2000 (7 years after accession), 10.9 percent of this cohort were still PCMOs and had not completed a residency program, 45.7 percent were in residency programs, 39.1 percent had completed residency programs and were serving as fully trained specialists, and 4.3 percent had attrited from the Navy.

Of the original cohort, 18 individuals, or 39 percent, ultimately completed in-house residency programs and were fully trained specialists. By FY 2000, all of these individuals were still in the Navy. Also, by this same time, 2 individuals, or 4 percent of the original cohort, attrited without entering or completing a residency program.

FY 1994 USUHS cohort

	FY94	FY95	FY96	FY97	FY98	FY99	FY00
Population	48	48	48	48	48	48	48
Attrition rate		0%	0%	0%	0%	0%	0%
Cumulative attrition rate		0%	0%	0%	0%	0%	0%
PCMOs		38	35	26	11	6	5
PCMOs to population		79%	73%	54%	23%	13%	10%
PCMOs to initial population		79%	73%	54%	23%	13%	10%
Residents/fellows (R/F)		10	13	18	26	29	28
R/F to population		21%	27%	38%	54%	60%	58%
R/F to initial population		21%	27%	38%	54%	60%	58%
Specialists				4	11	13	15
Specialists to population				8%	23%	27%	31%
Specialists to initial population				8%	23%	27%	31%
Number board certified (BC)				1	4	8	10
BC to specialists				25%	36%	62%	67%
Number attrited							
Attrition rate							
Cumulative no. of specialists				4	11	13	15
Cumulative no. attrited							
Cumulative attrition rate							

No. attrited w/o R/F program*

Cumulative no. attrited

No. attrited to initial population

In FY 1994, the Navy accessed 48 physicians from the USUHS pipeline. The average age of these accessions was 29.1 years, and 71 percent were male. Many of the new accessions had previous military experience because the average YOS and YOCs at the end of FY 1994 were 2.0 and 0.9 years, respectively. The ethnic mix of these accessions was 90 percent Caucasian, 0 percent Asian, and 2 percent other ethnicities. The entire cohort was accessed as O-3s.

Upon completion of PGY-1 (intern) year, 79 percent of this cohort (38 individuals) were assigned to a PCMO tour in FY 1995. The remaining 21 percent (10 individuals) went directly into residency programs. Six years after accession (FY 2000), of the original 48 individuals in the cohort, 10.4 percent were still assigned as PCMOs, 58.3 percent were in residency programs, 31.3 percent had completed residency programs and were fully trained specialists, and none had attrited from the Navy.

FY 1995 USUHS cohort

	FY95	FY96	FY97	FY98	FY99	FY00
Population	41	41	41	41	41	41
Attrition rate		0%	0%	0%	0%	0%
Cumulative attrition rate		0%	0%	0%	0%	0%
PCMOs		34	33	27	14	7
PCMOs to population		83%	80%	66%	34%	17%
PCMOs to initial population		83%	80%	66%	34%	17%
Residents/fellows (R/F)		7	8	10	21	30
R/F to population		17%	20%	24%	51%	73%
R/F to initial population		17%	20%	24%	51%	73%
Specialists				4	6	4
Specialists to population				10%	15%	10%
Specialists to initial population				10%	15%	10%
Number board certified (BC)				2	4	2
BC to specialists				50%	67%	50%
Number attrited						
Attrition rate						
Cumulative no. of specialists				4	6	4
Cumulative no. attrited						
Cumulative attrition rate						
No. attrited w/o R/F program*						
Cumulative no. attrited						
No. attrited to initial population						

In FY 1995, the Navy accessed 41 physicians from the USUHS pipeline. The average age of these accessions was 29.0 years, and 80 percent were male. Many of the new accessions had previous military experience because the average YOS and YOCS at the end of FY 1995 were 4.9 and 4.7 years, respectively. The ethnic mix of these accessions was 90 percent Caucasian, 0 percent Asian, and 5 percent other ethnicities. The entire cohort was accessed as O-3s.

Upon completion of PGY-1 (intern) year, 83 percent of this cohort (34 individuals) were assigned to a PCMO tour in FY 1996. The remaining 17 percent (7 individuals) went directly into residency programs. By FY 2000 (five years after accession), 17.1 percent were still assigned as PCMOs, 73.2 percent were in residency programs, 9.8 percent had completed residency programs and were fully trained specialists, and none had attrited from the Navy.

FY 1996 USUHS cohort

	FY96	FY97	FY98	FY99	FY00
Population	48	48	48	48	48
Attrition rate		0%	0%	0%	0%
Cumulative attrition rate		0%	0%	0%	0%
PCMOs	35	31	22	7	
PCMOs to population	73%	65%	46%	15%	
PCMOs to initial population	73%	65%	46%	15%	
Residents/fellows (R/F)	13	17	19	28	
R/F to population	27%	35%	40%	58%	
R/F to initial population	27%	35%	40%	58%	
Specialists			7	13	
Specialists to population			15%	27%	
Specialists to initial population			15%	27%	
Number board certified (BC)			1	5	
BC to specialists			14%	38%	
Number attrited					
Attrition rate					
Cumulative no. of specialists			7	13	
Cumulative no. attrited					
Cumulative attrition rate					
No. attrited w/o R/F program*					
Cumulative no. attrited					
No. attrited to initial population					

In FY 1996, the Navy accessed 48 physicians from the USUHS pipeline. The average age of these accessions was 29.1 years, and 71 percent were male. Many of the new accessions had previous military experience because the average YOS and YOCS at the end of FY 1996 were 4.7 and 3.5 years, respectively. The ethnic mix of these accessions was 79 percent Caucasian, 2 percent black, 17 percent Asian, and 2 percent other ethnicities. The entire cohort was accessed as O-3s.

Upon completion of PGY-1 (intern) year, 73 percent of this cohort (35 individuals) were assigned to a PCMO tour in FY 1997. The remaining 27 percent (13 individuals) went directly into residency programs. By FY 2000 (four years after accession), 14.6 percent were still assigned as PCMOs, 58.3 percent were in residency programs, 27.1 percent had completed residency programs and were fully trained specialists, and none had attrited from the Navy.

FY 1997 USUHS cohort

	FY97	FY98	FY99	FY00
Population	48	48	48	48
Attrition rate		0%	0%	0%
Cumulative attrition rate		0%	0%	0%
PCMOs		30	25	17
PCMOs to population		63%	52%	35%
PCMOs to initial population		63%	52%	35%
Residents/fellows (R/F)		18	23	24
R/F to population		38%	48%	50%
R/F to initial population		38%	48%	50%
Specialists				7
Specialists to population				15%
Specialists to initial population				15%
Number board certified (BC)				1
BC to specialists				14%
Number attrited				
Attrition rate				
Cumulative no. of specialists				7
Cumulative no. attrited				
Cumulative attrition rate				
No. attrited w/o R/F program*				
Cumulative no. attrited				
No. attrited to initial population				

In FY 1997, the Navy accessed 48 physicians from the USUHS pipeline. The average age of these accessions was 29.6 years, and 81 percent were male. Many of the new accessions had previous military experience because the average YOS and YOCS at the end of FY 1997 were 3.0 and 2.2 years, respectively. The ethnic mix of these accessions was 87 percent Caucasian, 0 percent black, 9 percent Asian, and 4 percent other ethnicities. The entire cohort was accessed as O-3s.

Upon completion of PCY-1 (intern) year, 62.5 percent of this cohort (30 individuals) were assigned to a PCMO tour in FY 1998. The remaining 37.5 percent (18 individuals) went directly into residency programs. By FY 2000 (three years after accession), 35.4 percent were still assigned as PCMOs, 50.0 percent were in residency programs, 14.3 percent had completed residency programs and were fully trained specialists, and none had attrited from the Navy.

Appendix D: AFHPSP (full deferment) cohort analysis

FY 1987 AFHPSP (full deferment) cohort

	FY87	FY88	FY89	FY90	FY91	FY92	FY93	FY94	FY95	FY96	FY97	FY98	FY99	FY00
Population (specialists)	91	90	87	82	58	26	17	14	10	8	6	5	5	5
Attrition rate		1%	3%	6%	29%	55%	35%	18%	29%	20%	25%	17%	0%	0%
Cumulative attrition rate		1%	4%	10%	36%	71%	81%	85%	89%	91%	93%	95%	95%	95%
Number board certified (BC)*	6	31	52	65	49	22	17	14	10	8	6	5	5	5
BC to specialists*	7%	34%	60%	79%	84%	85%	100%	100%	100%	100%	100%	100%	100%	100%

* This represents the number or percentage of physicians that were board certified in the specialty or subspecialty they had when accessed and not the actual specialty or subspecialty they had in later fiscal years.

In FY 1987, the Navy accessed 91 physicians from the AFHPSP (full deferment) pipeline. The average age of these accessions was 30.9 years, and 80 percent were male. The vast majority of the new accessions had no previous military experience because the average YOS and YOCS at the end of FY 1987 was 0.6 years for both. The ethnic mix of these accessions was 100 percent Caucasian. Seventy-six percent were accessed as O-3s and the remaining 24 percent were accessed as O-4s.

Only 10 percent of these specialists attrited by three years after accession (FY 1990); however, by six years after accession (FY 1993), 81 percent had left the Navy. By FY 2000 (13 years after accession), 95 percent had attrited from the Navy.

FY 1988 AFHPSP (full deferment) cohort

	FY88	FY89	FY90	FY91	FY92	FY93	FY94	FY95	FY96	FY97	FY98	FY99	FY00
Population (specialists)	97	94	94	89	51	14	9	9	7	6	5	5	4
Attrition rate		3%	0%	5%	43%	73%	36%	0%	22%	14%	17%	0%	20%
Cumulative attrition rate		3%	3%	8%	47%	86%	91%	91%	93%	94%	95%	95%	96%
Number board certified (BC)*	15	43	67	78	44	12	8	8	7	6	5	5	4
BC to specialists*	15%	46%	71%	88%	86%	86%	89%	89%	100%	100%	100%	100%	100%

* This represents the number or percentage of physicians that were board certified in the specialty or subspecialty they had when accessed and not the actual specialty or subspecialty they had in later fiscal years.

In FY 1988, the Navy accessed 97 physicians from the AFHPSP (full deferment) pipeline. The average age of these accessions was 31.8 years, and 90 percent were male. The vast majority of the new accessions had no previous military experience because the average YOS and YOCS at the end of FY 1988 were 0.6 and 0.5 years, respectively. The ethnic mix of these accessions was 94 percent Caucasian and 6 percent black. Seventy-one percent were accessed as O-3s, 28 percent were accessed as O-4s, and 1 percent were accessed as O-5s.

Only 8 percent of these specialists attrited by three years after accession (FY 1991); however, by six years after accession (FY 1994), 91 percent had left the Navy. By FY 2000 (12 years after accession), 96 percent had attrited from the Navy.

FY 1989 AFHPSP (full deferment) cohort

	FY89	FY90	FY91	FY92	FY93	FY94	FY95	FY96	FY97	FY98	FY99	FY00
Population (specialists)	89	89	87	84	46	18	11	7	7	4	3	3
Attrition rate		0%	2%	3%	45%	61%	39%	36%	0%	43%	25%	0%
Cumulative attrition rate		0%	2%	6%	48%	80%	88%	92%	92%	96%	97%	97%
Number board certified (BC)*	11	34	59	68	37	14	8	7	7	4	3	3
BC to specialists*	12%	38%	68%	81%	80%	78%	73%	100%	100%	100%	100%	100%

* This represents the number or percentage of physicians that were board certified in the specialty or subspecialty they had when accessed and not the actual specialty or subspecialty they had in later fiscal years.

In FY 1989, the Navy accessed 89 physicians from the AFHPSP (full deferment) pipeline. The average age of these accessions was 31.8 years, and 94 percent were male. The vast majority of the new accessions had no previous military experience because the average YOS and YOCS at the end of FY 1989 were 0.4 and 0.3 years, respectively. The ethnic mix of these accessions was 96 percent Caucasian and 4 percent black. Sixty-six percent were accessed as O-3s and the remaining 34 percent were accessed as O-4s.

Only 6 percent of these specialists attrited by three years after accession (FY 1992); however, by six years after accession (FY 1995), 88 percent had left the Navy. By FY 2000 (11 years after accession), 97 percent had attrited from the Navy.

FY 1990 AFHPSP (full deferment) cohort

	FY90	FY91	FY92	FY93	FY94	FY95	FY96	FY97	FY98	FY99	FY00
Population (specialists)	118	118	118	116	73	26	19	14	11	9	7
Attrition rate		0%	0%	2%	37%	64%	27%	26%	21%	18%	22%
Cumulative attrition rate		0%	0%	2%	38%	78%	84%	88%	91%	92%	94%
Number board certified (BC)*	21	50	88	102	67	24	17	13	10	9	7
BC to specialists*	18%	42%	75%	88%	92%	92%	89%	93%	91%	100%	100%

* This represents the number or percentage of physicians that were board certified in the specialty or subspecialty they had when accessed and not the actual specialty or subspecialty they had in later fiscal years.

In FY 1990, the Navy accessed 118 physicians from the AFHPSP (full deferment) pipeline. The average age of these accessions was 31.8 years, and 97 percent were male. The vast majority of the new accessions had no previous military experience because the average YOS and YOCs at the end of FY 1990 were 0.3 and 0.2 years, respectively. The ethnic mix of these accessions was 100 percent Caucasian. Sixty-one percent were accessed as O-3s and the remaining 39 percent were accessed as O-4s.

Only 2 percent of these specialists attrited by three years after accession (FY 1993); however, by six years after accession (FY 1996), 84 percent had left the Navy. By FY 2000 (10 years after accession), 94 percent had attrited from the Navy.

FY 1991 AFHPSP (full deferment) cohort

	FY91	FY92	FY93	FY94	FY95	FY96	FY97	FY98	FY99	FY00
Population (specialists)	73	73	73	72	44	22	15	10	8	5
Attrition rate		0%	0%	1%	39%	50%	32%	33%	20%	38%
Cumulative attrition rate		0%	0%	1%	40%	70%	79%	86%	89%	93%
Number board certified (BC)*	17	38	57	67	42	21	14	10	8	5
BC to specialists*	23%	52%	78%	93%	95%	95%	93%	100%	100%	100%

* This represents the number or percentage of physicians that were board certified in the specialty or subspecialty they had when accessed and not the actual specialty or subspecialty they had in later fiscal years.

In FY 1991, the Navy accessed 73 physicians from the AFHPSP (full deferment) pipeline. The average age of these accessions was 32.0 years, and 99 percent were male. The vast majority of the new accessions had no previous military experience because the average YOS and YOCS at the end of FY 1991 were 0.2 and 0.0 years, respectively. The ethnic mix of these accessions was 100 percent Caucasian. Seventy-four percent were accessed as O-3s and the remaining 26 percent were accessed as O-4s.

Only 1 percent of these specialists attrited by three years after accession (FY 1994); however, by six years after accession (FY 1997), 79 percent had left the Navy. By FY 2000 (9 years after accession), 93 percent had attrited from the Navy.

FY 1992 AFHPSP (full deferment) cohort

	FY92	FY93	FY94	FY95	FY96	FY97	FY98	FY99	FY00
Population (specialists)	67	67	66	63	43	22	10	8	7
Attrition rate		0%	1%	5%	32%	49%	55%	20%	13%
Cumulative attrition rate		0%	1%	6%	36%	67%	85%	88%	90%
Number board certified (BC)*	10	31	48	57	42	22	10	8	7
BC to specialists*	15%	46%	73%	90%	98%	100%	100%	100%	100%

* This represents the number or percentage of physicians that were board certified in the specialty or subspecialty they had when accessed and not the actual specialty or subspecialty they had in later fiscal years.

In FY 1992, the Navy accessed 67 physicians from the AFHPSP (full deferment) pipeline. The average age of these accessions was 31.8 years, and 97 percent were male. The vast majority of the new accessions had no previous military experience because the average YOS and YOCS at the end of FY 1992 were 0.1 and 0.0 years, respectively. The ethnic mix of these accessions was 93 percent Caucasian, 3 percent black, 2 percent Asian, and 2 percent other ethnicities. Sixty-four percent were accessed as O-3s and the remaining 36 percent were accessed as O-4s.

Only 6 percent of these specialists attrited by three years after accession (FY 1995); however, by six years after accession (FY 1998), 85 percent had left the Navy. By FY 2000 (8 years after accession), 90 percent had attrited from the Navy.

FY 1993 AFHPSP (full deferment) cohort

	FY93	FY94	FY95	FY96	FY97	FY98	FY99	FY00
Population (specialists)	50	50	50	45	29	11	4	3
Attrition rate		0%	0%	10%	36%	62%	64%	25%
Cumulative attrition rate		0%	0%	10%	42%	78%	92%	94%
Number board certified (BC)*	7	17	30	39	27	11	4	3
BC to specialists*	14%	34%	60%	87%	93%	100%	100%	100%

* This represents the number or percentage of physicians that were board certified in the specialty or subspecialty they had when accessed and not the actual specialty or subspecialty they had in later fiscal years.

In FY 1993, the Navy accessed 50 physicians from the AFHPSP (full deferment) pipeline. The average age of these accessions was 32.5 years, and 98 percent were male. The vast majority of the new accessions had no previous military experience because the average YOS and YOCS at the end of FY 1993 were 0.6 and 0.4 years, respectively. The ethnic mix of these accessions was 98 percent Caucasian and 2 percent Asian. Sixty-four percent were accessed as O-3s and the remaining 36 percent were accessed as O-4s.

Only 10 percent of these specialists attrited by three years after accession (FY 1996); however, by six years after accession (FY 1999), 92 percent had left the Navy. By FY 2000 (7 years after accession), 94 percent had attrited from the Navy.

FY 1994 AFHPSP (full deferment) cohort

	FY94	FY95	FY96	FY97	FY98	FY99	FY00
Population (specialists)	31	31	31	26	19	9	2
Attrition rate		0%	0%	16%	27%	53%	78%
Cumulative attrition rate		0%	0%	16%	39%	71%	94%
Number board certified (BC)*	1	11	13	20	18	9	2
BC to specialists*	3%	35%	42%	77%	95%	100%	100%

* This represents the number or percentage of physicians that were board certified in the specialty or subspecialty they had when accessed and not the actual specialty or subspecialty they had in later fiscal years.

In FY 1994, the Navy accessed 31 physicians from the AFHPSP (full deferment) pipeline. The average age of these accessions was 33.2 years, and 87 percent were male. The vast majority of the new accessions had no previous military experience because the average YOS and YOCS at the end of FY 1994 was 0.4 years for both. The ethnic mix of these accessions was 96 percent Caucasian and 4 percent black. Forty-five percent were accessed as O-3s and the remaining 55 percent were accessed as O-4s.

Only 16 percent of these specialists attrited by three years after accession (FY 1997); however, by six years after accession (FY 2000), 94 percent had left the Navy.

FY 1995 AFHPSP (full deferment) cohort

	FY95	FY96	FY97	FY98	FY99	FY00
Population (specialists)	18	18	18	16	9	6
Attrition rate		0%	0%	11%	44%	33%
Cumulative attrition rate		0%	0%	11%	50%	67%
Number board certified (BC)*	2	8	14	14	9	6
BC to specialists*	11%	44%	78%	88%	100%	100%

* This represents the number or percentage of physicians that were board certified in the specialty or subspecialty they had when accessed and not the actual specialty or subspecialty they had in later fiscal years.

In FY 1995, the Navy accessed 18 physicians from the AFHPSP (full deferment) pipeline. The average age of these accessions was 33.8 years, and 83 percent were male. The vast majority of the new accessions had no previous military experience because the average YOS and YOCS at the end of FY 1995 was 0.7 years for both. The ethnic mix of these accessions was 100 percent Caucasian. Thirty-three percent were accessed as O-3s and the remaining 67 percent were accessed as O-4s.

Only 11 percent of these specialists attrited by three years after accession (FY 1998); however, by FY 2000 (5 years after accession), 67 percent had attrited from the Navy.

FY 1996 AFHPSP (full deferment) cohort

	FY96	FY97	FY98	FY99	FY00
Population (specialists)	23	23	23	21	12
Attrition rate		0%	0%	9%	43%
Cumulative attrition rate		0%	0%	9%	48%
Number board certified (BC)*	1	6	10	12	9
BC to specialists*	4%	26%	43%	57%	75%

* This represents the number or percentage of physicians that were board certified in the specialty or subspecialty they had when accessed and not the actual specialty or subspecialty they had in later fiscal years.

In FY 1996, the Navy accessed 23 physicians from the AFHPSP (full deferment) pipeline. The average age of these accessions was 33.2 years, and 87 percent were male. The vast majority of the new accessions had no previous military experience because the average YOS and YOCS at the end of FY 1996 were 0.6 and 0.5 years, respectively. The ethnic mix of these accessions was 100 percent Caucasian. Fifty-two percent were accessed as O-3s and the remaining 48 percent were accessed as O-4s.

Only 9 percent of these specialists attrited by three years after accession (FY 1999); however, by FY 2000 (4 years after accession), 48 percent had attrited from the Navy.

FY 1997 AFHPSP (full deferment) cohort

	FY97	FY98	FY99	FY00
Population (specialists)	50	50	50	50
Attrition rate		0%	0%	0%
Cumulative attrition rate		0%	0%	0%
Number board certified (BC)*	9	23	27	43
BC to specialists*	18%	46%	54%	86%

* This represents the number or percentage of physicians that were board certified in the specialty or subspecialty they had when accessed and not the actual specialty or subspecialty they had in later fiscal years.

In FY 1997, the Navy accessed 50 physicians from the AFHPSP (full deferment) pipeline. The average age of these accessions was 31.7 years, and 68 percent were male. The vast majority of the new accessions had no previous military experience because the average YOS and YOCS at the end of FY 1997 was 0.5 years for both. The ethnic mix of these accessions was 100 percent Caucasian. Ninety percent were accessed as O-3s and the remaining 10 percent were accessed as O-4s.

None of these specialists attrited by three years after accession (FY 2000).

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