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Forecasting the Supply of and Demand for Oncologists:

A Report to the American Society of Clinical Oncology (ASCO) from the AAMC Center for Workforce Studies

Center for Workforce Studies
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Executive Summary

Overview

In 2005, the American Society of Clinical Oncology commissioned the Center for Workforce Studies at the Association of American Medical Colleges to conduct an analysis of the oncologist workforce, focusing on medical oncologists, hematologist/oncologists, pediatric hematologist/oncologists, and gynecologic oncologists. The study was designed better understand the current supply of oncologists and to forecast the supply of and demand for oncologists through 2020. Because the data used for developing the demand projections are based largely from Medicare data for the over-age-65 population, pediatric hematologist/oncologists were not included in the forecast.

The Center collected original data through a Survey of Clinical Oncologists, surveys of fellows entering and completing oncology training, and a survey of oncology program directors. In addition, the Center analyzed existing data sources such as the American Medical Association's Physician Masterfile, a national database of practicing physicians; the National Cancer Institute (NCI) Surveillance, Epidemiology and End Results (SEER) database; and board certification data from the American Board of Internal Medicine (ABIM), the American Board of Pediatrics (ABP), and the American Board of Obstetrics and Gynecology (ABOG). The Center also worked with the National Cancer Institute (NCI) to forecast future demand for oncologists.

While the number of oncologists has more than doubled over the past two decades, supply is projected to only increase 20% between now and 2020, and capacity for oncologist visits is projected to rise even less at 14%. Demand for oncologist services is projected to grow by 48% during that same time. The projections were based on current cancer rates and delivery patterns applied to the expected U.S. population in 2020. Unless there is a dramatic change in cancer care treatment or delivery between now and 2020, the nation is expected to face an acute shortage of oncologists (medical oncologists, hematologist/oncologists, and gynecologic oncologists).

Current Supply of Oncologists

As of 2005, there were approximately 13,000 oncologists practicing in the United States: 81% were medical oncologists or hematologist/oncologists, 14% were pediatric hematologist/oncologists, and 5% were gynecologic oncologists.ⁱ The oncologist workforce has slightly lower percentages of females (24%) and slightly higher percentages of international medical graduates (29%) than the full physician workforce which is 27% female and 25% international medical graduates (IMGs). Over half (54%) of the currently practicing oncologists are aged 50 or older and will be 65 or older by the year 2020. The majority of oncologists (57%) work in private practice settings, 32% in academic settings and the balance are in government (2.4%), industry (2.4%) or other settings (5.6%). Approximately 500 fellows a year complete an oncology fellowship in one of the three specialties modeled in the study, and oncology program directors report limited plans to increase the number of training slots between now and the 2010-11 academic year.

Modeling Future Supply and Demand

Many workforce studies focus on the overall physician to population ratio, but this only tells part of the story for a specialty like oncology that primarily provides care to one segment of the population, the growing population of people aged 65 or older.ⁱⁱ Additionally, the increasing number of cancer survivors will contribute to an increase in need and demand for oncologists. In 1971, there were approximately 3 million cancer survivors in the United States and by 2001, that number increased to nearly 10 million.¹ Cancer survivors make up a significant proportion of overall cancer visits. This model is based on visit-rates as measured in total annual supply of visits (or visit capacity) and in total annual demand for visits.

Baseline Supply Model

The baseline supply model assumes that oncologist practice patterns will be the same in 2020 as they are today. Based on results of the 2006 Survey of Clinical Oncologists conducted for this

ⁱ The percent in academics is significantly higher in pediatric hematology/oncology (76%) and in gynecologic oncology (54%).

ⁱⁱ While the study does include pediatric hematologist/oncologists, the model only forecasts supply and demand for medical oncologists, hematologist/oncologists, and gynecologic oncologists.

study, three key variables affect the number of visits that an oncologist provides: practice setting, age, and gender. The most significant factor is practice setting – academics typically provide half the number of patient visits per week than those in private practice settings. Additionally, physicians at the beginning and end of their careers have fewer visits per week than do those aged 45-64, and females generally have slightly lower visit-rates than males.

Even though the number of oncologists is projected to increase by 20% between now and 2020, visit capacity will grow by only 14%. This reflects the fact that a smaller percentage of the workforce will be in the prime productivity cohort (age 45 - 64) as older physicians age out of the workforce. Overall productivity could be even lower if the newer generations of physicians do not increase productivity as they age into the 45 - 64 cohort. The model assumes the percentage of physicians in private practice and academic settings will remain constant over time. Visit capacity is projected to increase by 14% between 2005 and 2020.

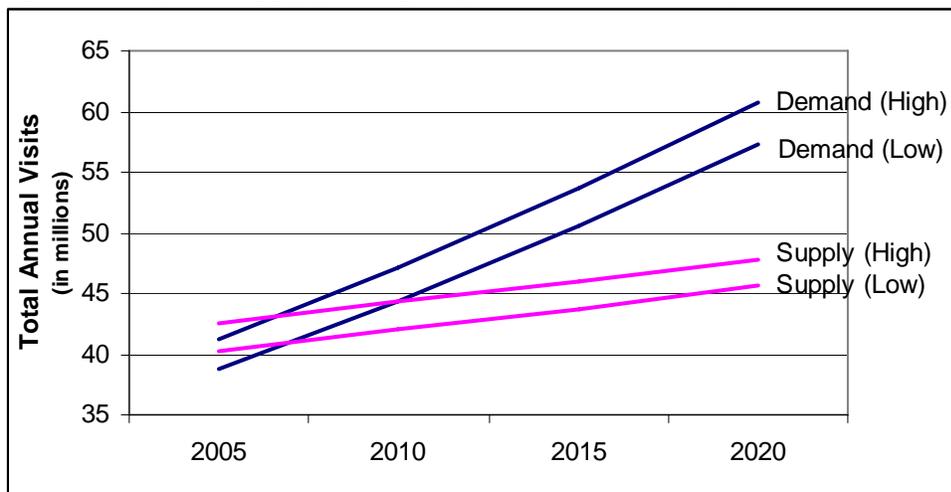
Baseline Demand Model

The baseline demand model assumes that utilization patterns will be the same in 2020 as they are today. NCI provided two key sets of data that allowed us to forecast total annual demand for visits: 1) cancer incidence and prevalence projections; and 2) visit-rate data for patients with cancer. Applying the visit-rate data to the cancer incidence and projection forecasts reveals that annual demand for cancer visits will grow from 41.2 million in 2005 to 60.7 million in 2020.

Baseline Forecast

The supply of and demand for oncologists is projected to move from a relative state of balance in 2005 to a state of acute shortage in 2020, with visit demand growing at a much quicker pace than the available visit supply (see Figure 1).

Figure 1: Projected supply (visit capacity) and demand for visits, 2005-2020



While visit capacity will increase by 14% between now and 2020 – assuming that there is no change in practice patterns during the intervening years – demand is projected to increase 48%, leaving a shortage of 9.4 to 15.1 million visits. This translates into a shortage of 2,550 to 4,080 oncologists – roughly 25% to 40% of the 2005 supply.

Scenarios

The baseline supply and demand models assume that practice and utilization patterns will remain the same in 2020 as they are today. To show how demand and supply could vary if there is a change in how cancer care is delivered or if there is an increase in the supply of oncologists, several different scenarios were modeled.

Supply scenarios included:

- Increased the number of fellowship slots (minimum of 8% and maximum of 50%)
- Increased usage of nurse practitioners and physician assistants (providing traditional and advanced services)
- Delayed retirements (10% delay retirement five years and 50% delay retirement five years)
- Lower lifetime productivity for younger generations of oncologists (no increase in visit-rates when younger physicians become 45-64 years of age)

- Increased productivity due to electronic medical records or other reasons (phased-in increased productivity of 5% and 10%)

Demand scenarios included:

- Growth in percent of patients in the initial year of diagnosis who see an oncologist and in the mean visits for these patients (annual 2% increase in percent of incident cases that see an oncologist and 2% increase in mean visit-rates for incident patients)
- Increase in visit-rates for patients aged 70+ (increase midway to 65-69 visit-rate and equal to 65-69 visit-rate)
- Increased use of hospice providers to treat patients in the last year of life (20% reduction in percent of patients in last year of life that see an oncologist)
- Increased use of primary care providers to monitor patients in remission (10% and 20% reduction in percentage of patients in the monitoring phase who see an oncologist)

No single change in cancer care delivery or in utilization can offset the projected gap between supply and demand in 2020. If visit-rates increase in the future due to changes in treatment patterns as might occur with development of new adjuvant therapies, demand could grow significantly higher than the baseline projection. Figure 2 shows the range of possible visit capacities under various scenarios. If a 50% increase in the number of training spots is phased-in between 2008 and 2015, supply will increase to 51 million visits. However, this scenario is fairly ambitious and unlikely because of limited fellowship program expansion plans and the fact that oncology will be competing with other internal medicine subspecialties for a likely stagnant supply of internal medicine residents. In addition, Scenario I shows that productivity could be as low as 41 million if younger generations of oncologists have lower lifetime productivity than the current generation of physicians.

Figure 2: Supply scenarios range from a high of 51 million in 2020 to a low of 41 million

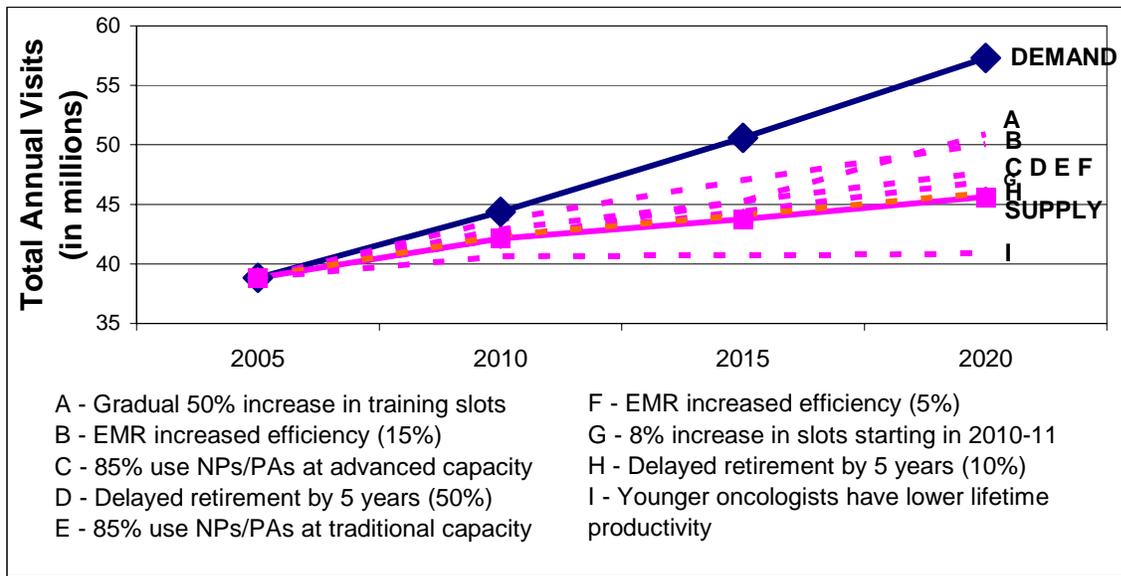
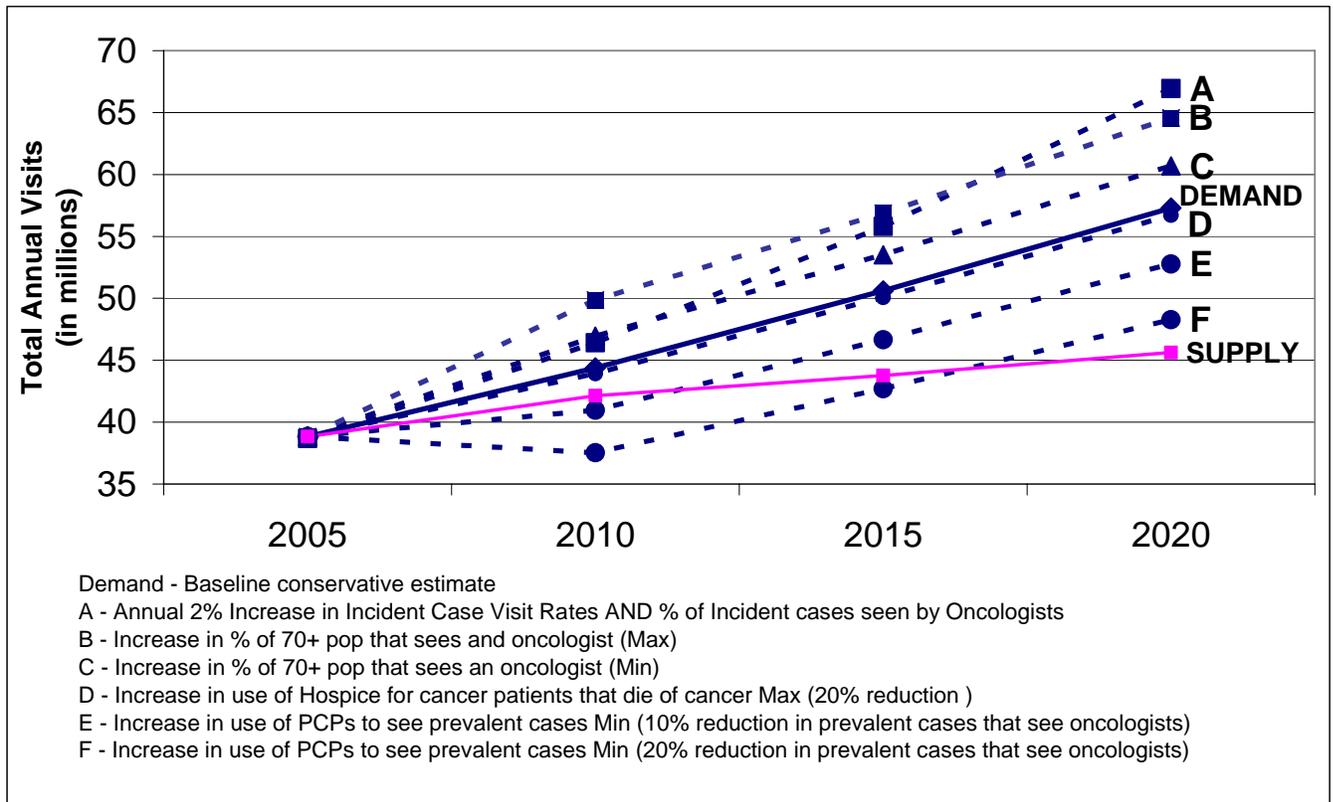


Figure 3 shows the possible range in demand for visits under various scenarios. Scenario A shows the impact of a 2% increase in the annual visit-rate and in the mean number of visits for patients in the initial 12 months post diagnosis. Under this scenario, demand could rise to 67 million visits. Scenario F shows that demand could be as low as 48 million visits if primary care physicians assume a significantly greater role in monitoring patients who are not in active cancer treatment. However, this will be a challenging scenario because primary care is facing shortages and the difficulty of building in time for chronic care management into increasingly shorter office visits.

Figure 3: Demand scenarios range from a high of 67 million to a low of 48 million



ASCO, policymakers, and the public will have major challenges ahead in order to forestall likely shortages in the capacity to meet future demand for oncologist services.

Chapter 1: Introduction

There is growing evidence that the nation is facing a physician shortage, largely driven by the aging of the population and a physician workforce that has not grown to meet the needs of the nation.^{2 3 4 5} The U.S. Census Bureau projects the number of Americans aged 65 and older will double between 2000 and 2030.⁶ Cancer is primarily a disease of the elderly and hence, oncologists care disproportionately for older patients. Therefore, the aging of the population will likely increase the demand for oncologist services. Age-related growth in cancer rates will also be accompanied by an increasing number of cancer survivors requiring ongoing monitoring and care from oncologists.⁷ New therapies tend to be complex and often extend life, both of which tend to increase demand for services. All of this will come at a time when the oncologist workforce is aging and heading into retirement in increasing numbers.

An ASCO study of the oncologist workforce conducted in the mid-1990s found that supply and demand were in equilibrium. However, growing concern in the health care community regarding the potential for general physician shortages led ASCO to form a task force on the oncologist workforce and determine if this equilibrium would be sustained into the future.^{8 9 10 11 12 13 14 15 16 17 18 19 20 21 22}

ASCO commissioned the AAMC Center for Workforce Studies to provide a comprehensive assessment of the current and likely future supply and demand for oncologists that focused on four specialties: medical oncology, hematology/oncology, pediatric hematology/oncology, and gynecologic oncology. The Center analyzed the current supply of oncologists and the pipeline of new fellows, and studied the demand for oncologist services. This data informed models projecting future supply of oncologists and demand for oncologist services through 2020.

Methods

Data Collection

In collaboration with the ASCO Workforce in Oncology Task Force, the AAMC Center for Workforce Studies collected original data through surveys of practicing oncologists, oncology

fellows, and oncology fellowship program directors. In 2006, the Survey of Clinical Oncologists was administered to a random sample of 4,000 oncologists (including physicians with a primary or secondary specialty of medical oncology, hematology/oncology, gynecologic oncology, and pediatric hematology/oncology) drawn from the AMA Physician Masterfile and received a 42% response rate. The survey included questions on current practice activities, work hours, visit-rates, practice setting, use of nurse practitioners (NPs) and physician assistants (PAs), and options for addressing future workforce shortages.

The AAMC/ASCO surveys of entering and exiting fellows were administered by e-mail using contact information provided by ASCO. The Survey of Clinical Oncology Fellows Completing Training in 2005 was administered in June 2005 to 442 fellows completing training in 2005, and received a 50% response rate. The survey included questions on post-training plans and factors influencing post-training activities. The Survey of Oncology Fellows Entering Training in 2006 was administered in May 2006 to 438 fellows entering training in 2006, and received a 62% response rate. The survey asked about reasons for selecting oncology and future career expectations. The survey of oncology program directors was administered in 2005 to 242 directors using contact information provided by ASCO, and received a 67% response rate. The survey included questions about the number of fellowship positions available, practice setting of recent graduates, and plans to expand fellowship positions.

In addition, the Center analyzed existing data sources including the American Medical Association's Physician Masterfile, a national database of physicians; cancer registry data from the NCI's Surveillance, Epidemiology and End Results (SEER) database; U.S. Census Bureau population projections; and board certification data from the American Board of Internal Medicine, American Board of Pediatrics, and the American Board of Obstetrics and Gynecology.

Modeling Supply and Demand

The supply and demand projections focused exclusively on medical oncologists, hematologist/oncologists, and gynecologic oncologists. Pediatric hematologist/oncologists were included in the data collection activities, but were excluded from the modeling and scenarios, as national data on oncologist visit-rates was only available for the Medicare-eligible population.

The Center calculated baseline estimates of supply and demand that assume a continuation of present patterns, i.e., current cancer rates, visit-rates, practice patterns, and retirement rates. To assess the potential impact of changes in cancer care delivery and to explore options for addressing future shortages, the baseline visit capacity and visit forecasts were augmented by the development of possible alternate scenarios for the supply of and demand for oncologists. The scenarios were developed by changing a range of assumptions inherent to the baseline forecasting models.

Alternate supply scenario assumptions included:

- increasing the number of fellowship slots available
- productivity gains resulting from the increased use of NPs and PAs
- extending the physician supply through delays in physician retirement
- productivity increases due to the adoption of information technology or other practice efficiencies
- decreased productivity for younger generations of oncologists

Alternate demand scenario assumptions included:

- a gradual increase in the percentage of incident cancer cases seen by an oncologist combined with a gradual increase in the mean visit-rates for this population
- patients aged 70 and older adopting higher visit-rates, similar to those of patients under 70
- increased use of primary care physicians to monitor patients in remission
- increased use of hospice for cancer patients in the last year of life

The report includes an assessment of the likelihood of fruition for each of the scenarios and a discussion of the implementation challenges with achieving them.

Chapter 2: Supply of Oncologists

This chapter of the report pulls together data from multiple sources to describe the current supply of practicing oncologists, the new entrants into the workforce, and the retirement patterns of those who will exit the workforce. This information will form the basis of the model that will be used to forecast physician supply through 2020.

Section I: Practicing Oncologists

- Summary of findings
- Number of active practicing oncologists
- Demographics
- Historical trends
- Work hours and visits
- Use of NPs/PAs
- Pipeline of NPs/PAs
- Role of other specialists

Section II: New Entrants to the Oncologist Workforce

- Summary of findings
- Number of physicians completing training
- Historical trends
- Demographics
- Pipeline for new oncologists
- Work effort of new oncologists
- Interest in the specialty
- Job market

Section III: Retirements from the Oncologist Workforce

- Background on physician retirement
- Results of Survey of Clinical Oncologists
- Conclusions

The report includes data from existing sources such as the AMA Physician Masterfile; published data on graduate medical education such as the *Journal of the American Medical Association* (JAMA) Medical Education issues; and original data collection, such as the Survey of Oncology Fellows Entering Training in 2006, the Survey of Clinical Oncology Fellows Completing Training in 2005, the Survey of Clinical Oncology Fellowship Program Directors, and the Survey of Clinical Oncologists. See Table 1 for a full listing.

Table 1: Data sources on physician supply

Model	Data Source	Main Use
Current Supply	AMA Physician Masterfile data from 1981, 1991, 2001, and 2005	Number of active oncologists in 2005; trends in demographics and distribution
	2006 Survey of Clinical Oncologists	Measures of productivity
	AMA's <i>Physician Characteristics and Distribution in the U.S.</i> (PCD)	Historical trends of number of oncologists
	- American Board of Internal Medicine - American Board of Pediatrics - American Board of Obstetrics and Gynecology	Historical trends of board certifications in oncology
New Entrants	2005 Survey of Clinical Oncology Fellows Completing Training in 2005	Physician demographics and productivity
	2005 Survey of Clinical Oncology Fellowship Program Directors	Potential program growth
	Electronic Residency and Application Service (ERAS) and National Residency Match Program (NRMP) Data	Number of applicants per slot and demographics of applicants
	2006 Survey of Oncology Fellows Entering Training in 2006	Potential to recruit additional fellows
	JAMA Medical Education Issues	Historical trends on demographics of fellows
	- American Board of Internal Medicine - American Board of Pediatrics - American Board of Obstetrics and Gynecology	Past trends in number of first-time board test takers
Retirements	2006 Survey of Clinical Oncologists	Physician retirement rates

SECTION I: PRACTICING ONCOLOGISTS

For purposes of this study, we will focus on active oncologists listed in the 2005 AMA Physician Masterfile with either a primary specialty or secondary specialty in medical oncology, hematology/oncology, pediatric hematology/oncology, or gynecologic oncology.

Summary of Findings

- The AMA Physician Masterfile lists 13,398 active oncologists. 81% are medical oncologists or hematologist/oncologists, 14% are pediatric hematologist/oncologists, and 5% are gynecologic oncologists. The number of oncologists has grown 200% since 1986.
- The oncologist workforce has slightly lower percentages of females (24%) and slightly higher percentages of international medical graduates (29%) than the full physician workforce which is 27% female and 25% IMGs.
- Over half (54%) of the currently practicing oncologists are aged 50 or older and will be 65 or older by 2020. For the full physician workforce, 53% of active physicians are aged 50 or older.
- Oncologists work 53.7 hours per week on average. Academics spend significantly more time on research and teaching than do their peers in private practice and, therefore, have less time for patient care activities.
- There are three main predictors of visit-rates: practice setting, age, and gender. Private practice physicians have higher visit-rates per week than those in academic settings, as do physicians aged 45-64 when compared with younger and older physicians. Females in private practice settings have fewer visits per week than do their male counterparts. Gender variation in academic or other settings is not statistically significant.
- While only 8% of oncologists currently work part time, an additional 40% are interested in this as an option. However, half of those who said they are interested indicated that part-time hours were not available at their practice.
- Two-thirds of respondents indicated they work with NPs or PAs. The majority who do believe it benefits their practice through increased efficiency and improved patient care.

Number of Practicing Oncologists

According to the 2005 AMA Physician Masterfile, 13,398 active oncologists practice in the United States (see Table 2). Over three-fourths (77%) are listed as having a primary specialty in oncology and 23% have a secondary specialty in oncology. Most are medical oncologists or hematologist/oncologists (81%), and the balance is pediatric hematologist/oncologists (14%) and gynecologic oncologists (5%).

Table 2: Specialty distribution of the oncologist workforce

Specialty	Primary Specialty Oncology		Secondary Specialty Oncology*		Total	
	N	Row%	N	Row%	N	Row%
Medical Oncology and Hematology/Oncology	8402	77%	2451	23%	10,853	100%
Pediatric Hematology/Oncology	1482	79%	383	21%	1865	100%
Gynecologic Oncology	475	70%	205	30%	680	100%
Total	10,359	77%	3,039	23%	13,398	100%

* Primary Specialty other than Medical Oncology, Hem/Onc, Peds Hem/Onc, or Gyn Onc
Source: AMA Physician Masterfile, Jan 1, 2005

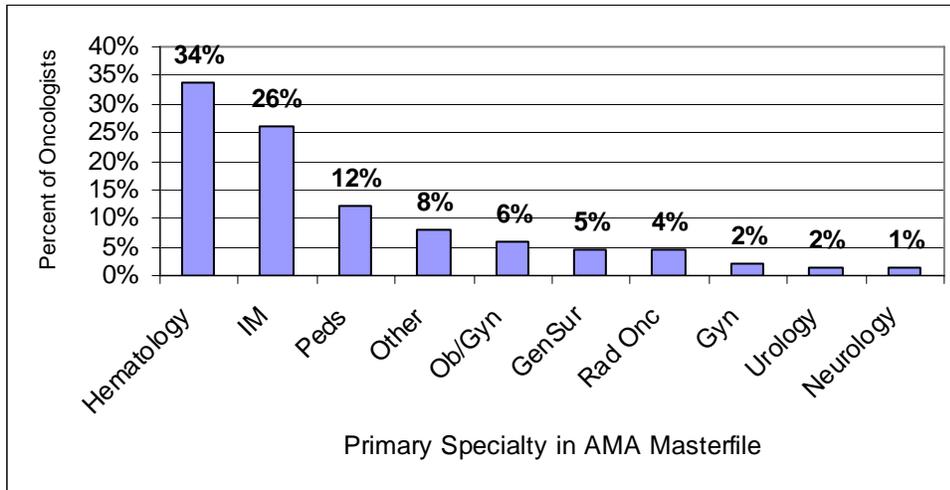
The AMA Physician Masterfile was not designed for workforce analysis, but is the most complete available roster of physicians. The AMA uses the Physician Masterfile data as the basis for the *Physician Characteristics and Distribution in the U.S. (PCD)*, which provides counts of the total number of physicians in a given specialty. The PCD counts are based exclusively on what is listed as the physicians' primary specialty and excludes osteopaths. When compared against the number of physicians with board certification in medical oncology, pediatric hematology/oncology, and gynecologic oncology, the PCD appears to undercount the number of oncologists. By adding those listed in the Physician Masterfile as having a secondary specialty in oncology, the counts are much more consistent with the board certification data (see Table 3).

Table 3: Comparing counts of oncologists

Specialty	PCD (Primary Specialty Only, MDs only)	AMA Physician Masterfile (Primary and Secondary, MD and DO)	Total Active Board Certified Physicians
Medical Oncology and Hematology/Oncology	7,865	10,853	10,016 ²³
Pediatric Hematology/Oncology	1,316	1,865	1,804 ²⁴
Gynecologic Oncology	463	680	655 ²⁵
Total	9,644	13,398	12,475

For the most part, when looking at the primary specialty of those who have only a secondary specialty in oncology, the primary specialty is a logical match with the physicians' listed secondary specialty. 80% of those with a secondary specialty in oncology have a primary specialty of hematology, internal medicine, pediatrics, or obstetrics/gynecology, leaving 20% that are possibly incorrectly listed in the Physician Masterfile (see Figure 4). Based on the rates of mismatched specialties, it is highly likely that including everyone with a secondary specialty of oncology will lead to an over-count of oncologists. Results of the 2006 Survey of Clinical Oncologists confirm this suspicion, as 14% of the surveyed physicians listed in the Physician Masterfile as having a secondary specialty in oncology replied that they were not oncologists. When modeling future physician supply, this error rate in the Physician Masterfile secondary specialty assignments will be factored into the estimates of the 2005 supply so that the model will not start out with an overestimate of the number of oncologists.

Figure 4: Distribution of the primary specialty for those with a secondary specialty in oncology

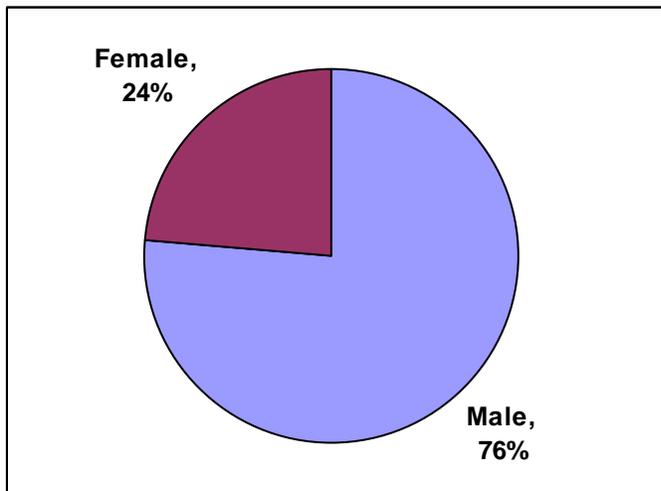


Source: AMA Physician Masterfile, Jan 1, 2005

Demographics of the Oncologist Workforce

In 2005, 24% of the oncologist workforce was female (Figure 5). This is slightly lower than the overall physician workforce, which was 27% female in 2005.

Figure 5: Gender distribution of active oncologists

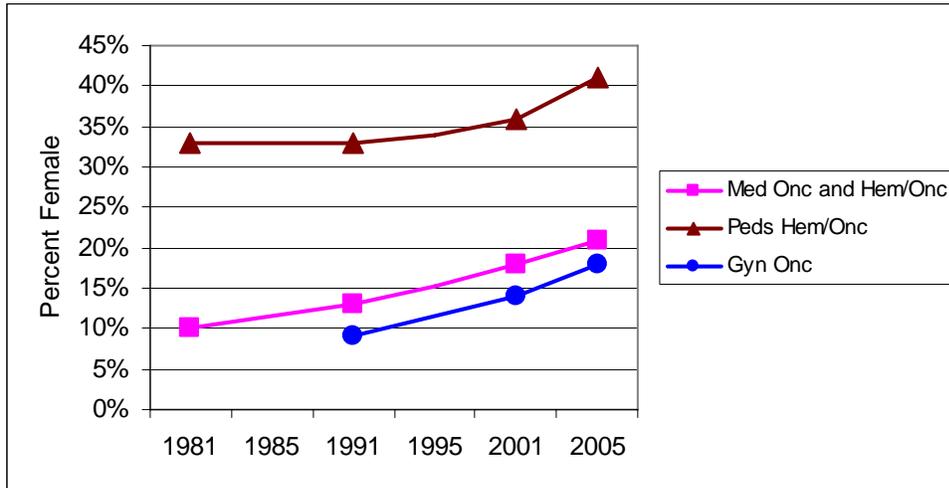


Source: AMA Physician Masterfile, Jan 1, 2005

Figure 6 illustrates the increasing percentages of women in the oncologist workforce in four separate snapshots of the AMA Physician Masterfile: 1981, 1991, 2001, and 2005. During that 24-year period, the percentage of females in medical oncology and hematology/oncology doubled from 10% to 21% and the percentage of females in pediatric hematology/oncology

increased from 33% to 41%. The Physician Masterfile did not list any gynecologic oncologists in 1981 but from 1991 to 2005, the percentage of females in gynecologic oncology doubled from 9% to 18%.

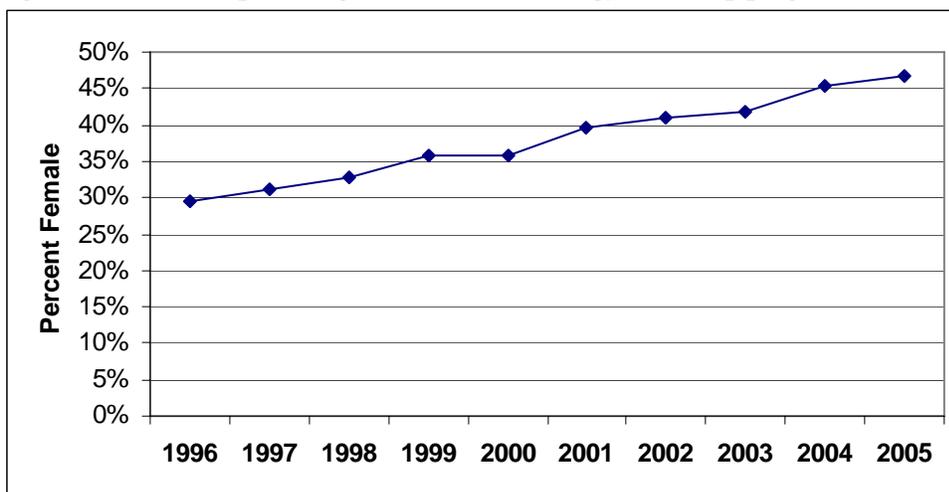
Figure 6: Growth in percent female in oncologist workforce by specialty, 1981-2005



Source: AMA Physician Masterfile 1981, 1991, 2001, and 2005

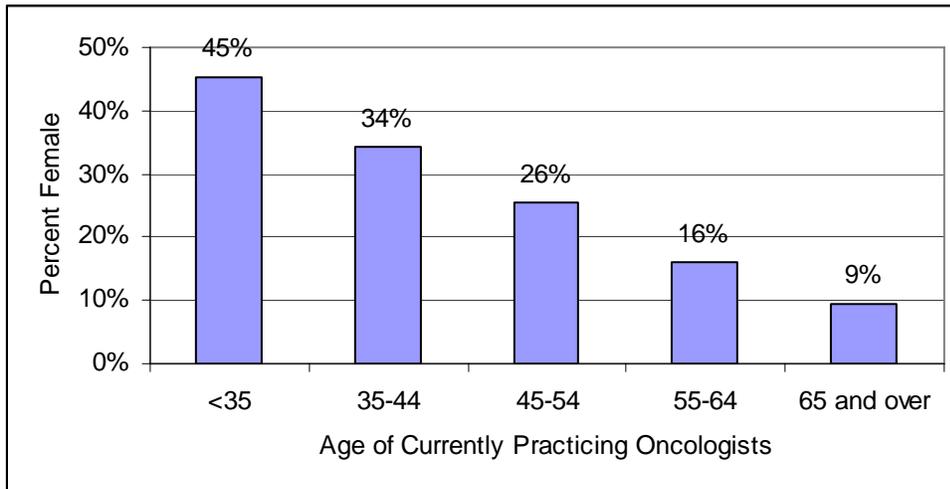
Because of recent growth in the percent of oncology fellows that are female (Figure 7) and because the older cohorts of physicians have lower percentages of females (Figure 8), clearly the overall percentage of female oncologists will increase as older physicians retire and younger physicians make up a larger percentage of the physician workforce.

Figure 7: Growth in percentage of females in oncology fellowship programs, 1996-2005



Source: JAMA Med Ed, 1997-2006

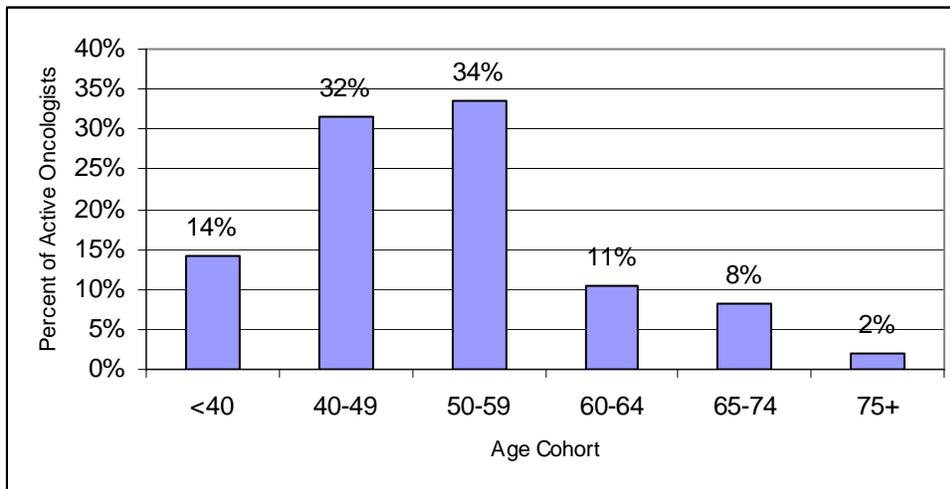
Figure 8: Percentage of currently practicing female oncologists by age category



Source: AMA Physician Masterfile, January 1, 2005

Over half of the currently active oncologists are over age 50 (see Figure 9). This is a significant factor in terms of the future workforce because by 2020, these physicians will be age 65 or older and likely to be leaving or have already left the workforce. For the full physician workforce, 53% of active physicians are aged 50 or older.

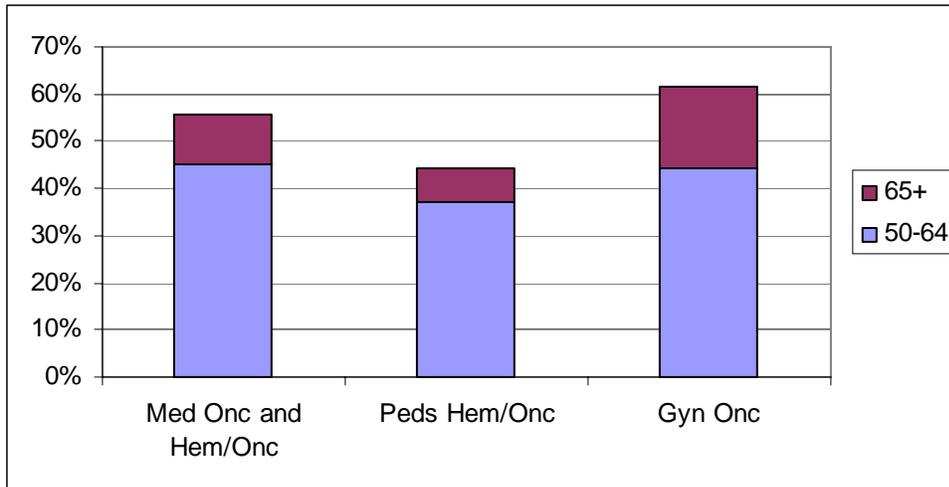
Figure 9: Age distribution of currently active oncologists



Source: AMA Physician Masterfile, Jan 1, 2005

Figure 10 shows the percentage of oncologists over age 50 by specialty. Gynecologic oncology has the oldest workforce with nearly two-thirds aged 50 or older (62%). Medical oncologists and hematologist/oncologists have the second lowest percentage with 55% of the workforce over the age 50, and pediatric hematologist/oncologists round out the group with 44% over age 50.

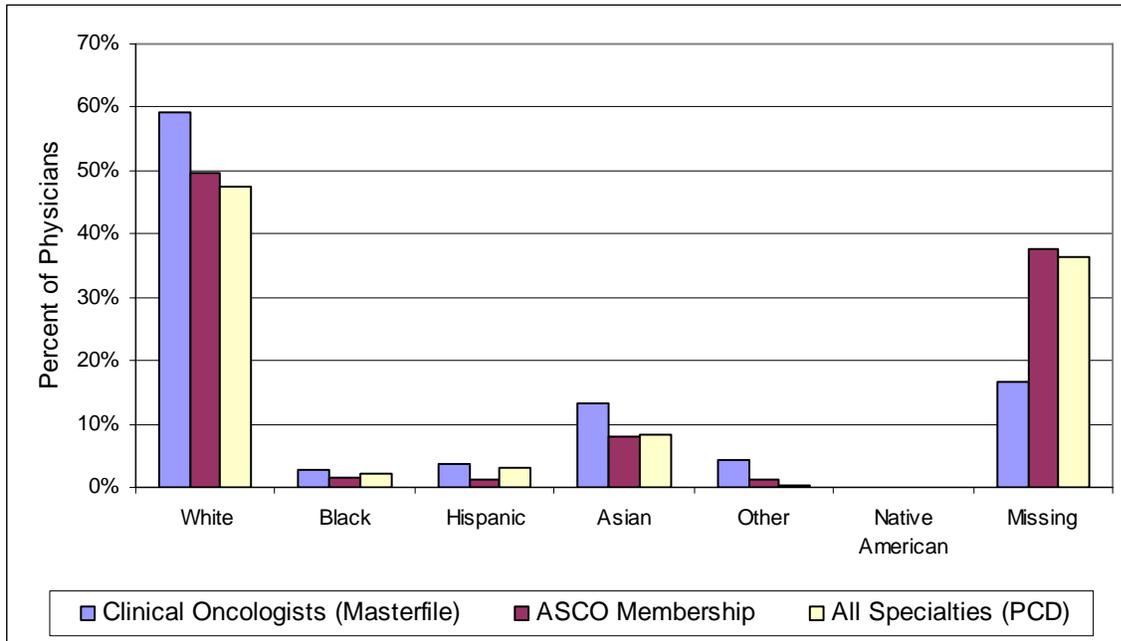
Figure 10: Percentage of currently active oncologists aged 50 or older, by specialty



Source: AMA Physician Masterfile, Jan 1, 2005

Figure 11 compares the racial/ethnicity distribution for oncologists with the ASCO membership directory and with the distribution across all specialties. According to the AMA Physician Masterfile sample of 4,000 physicians that was used for our Survey of Clinical Oncologists, the majority of oncologists are White (59%), which is a higher percentage than listed in the ASCO database (50%) or for physicians as a whole (48%). All three databases have high percentages of missing data, but, clearly relatively few oncologists are Black or Hispanic. ASCO and the United States. For the population of physicians as a whole, 2% Black and 3% Hispanic physicians are practicing medicine in the United States.

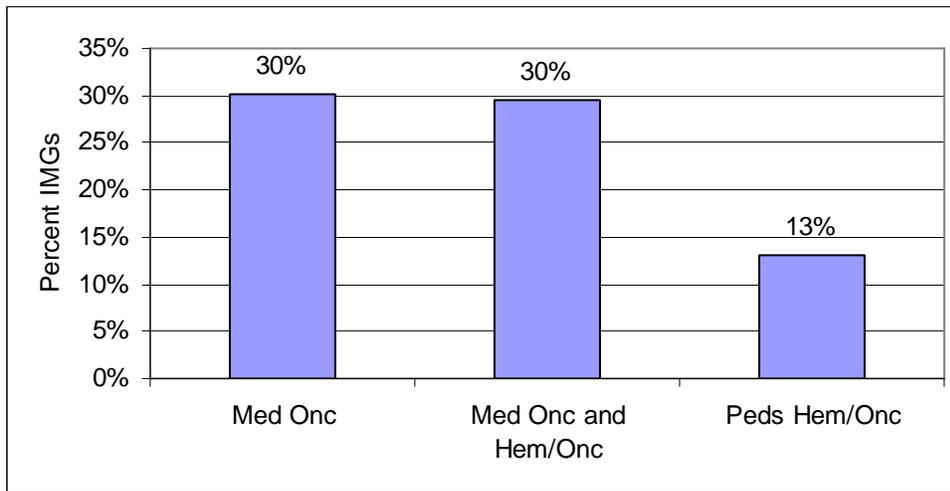
Figure 11: Race/Ethnicity by Specialty



Sources: AMA Physician Masterfile, survey sample population of 4,000; ASCO Membership Database – September 2004; Physician Characteristics and Distribution in the US, 2006 Edition, Table 1.20

In the overall physician workforce, the percentage of international medical graduates (IMGs) is 25%. For oncology, the percentage is 29%. Figure 12 shows the variation by specialty, with gynecologic oncology having the lowest percent of IMGs (13% versus 30% for the other specialties). The percentage of IMGs entering oncology has been decreasing over the past decade and will be discussed in the section on new entrants.

Figure 12: Percentage of international medical graduates by specialty

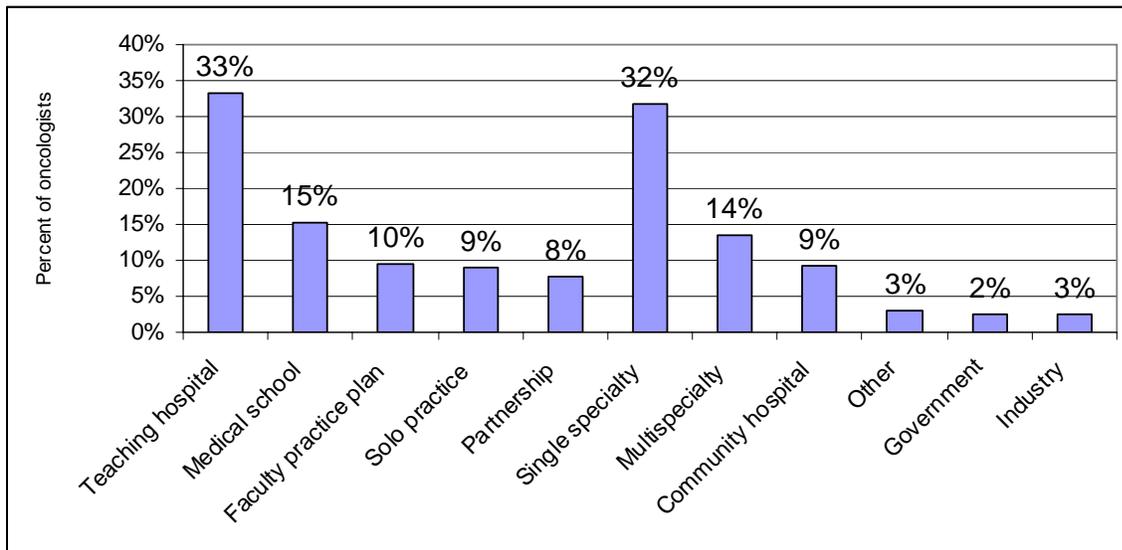


Source: AMA Physician Masterfile, Jan 1, 2005

Nearly all (92%) of the currently active respondents indicated they work full time in oncology related activities, with only 8% indicating they work part time in oncology. 57% of currently active respondents describe their principal work setting as private practice, 32% as academic, and the balance are in government (2.4%), industry (2.4%), or other settings (5.6%).

Respondents were also asked to further describe their practice setting, and the distribution is illustrated in Figure 13. Respondents could check all that apply, therefore, the percentages will not add to 100%. Group practices were the most likely to be selected with nearly half (46%) of the respondents describing their principal practice setting as a single- or multi-specialty group practice.

Figure 13: Principal practice setting of oncologists



Source: 2006 Survey of Clinical Oncologists

Work Hours and Patient Care Activities

On average, oncologists work 53.7 hours per week (see Table 4). There is no significant variation in work hours by specialty, but there is variation by practice setting. Academics work more hours per week than do their counterparts in other settings ($p < .05$). However, as will be discussed later, the additional work hours will not translate into higher patient visit-rates, as academics spend significantly less time on patient care activities.

Table 4: Mean hours worked per week, by practice setting

	Academic setting	Private practice	Government	Industry	Other	Total
	Mean	Mean	Mean	Mean	Mean	Mean
Weekly work hours	56.3	53.1	49.6	49.9	47.9	53.7

Source: 2006 Survey of Clinical Oncologists

There is strong interest in part-time hours. While only 8% currently work part time, another 40% are interested in this as an option. However, half of those who said they were interested in a part-time work option indicated part-time hours are not available at their practice (see Table 5).

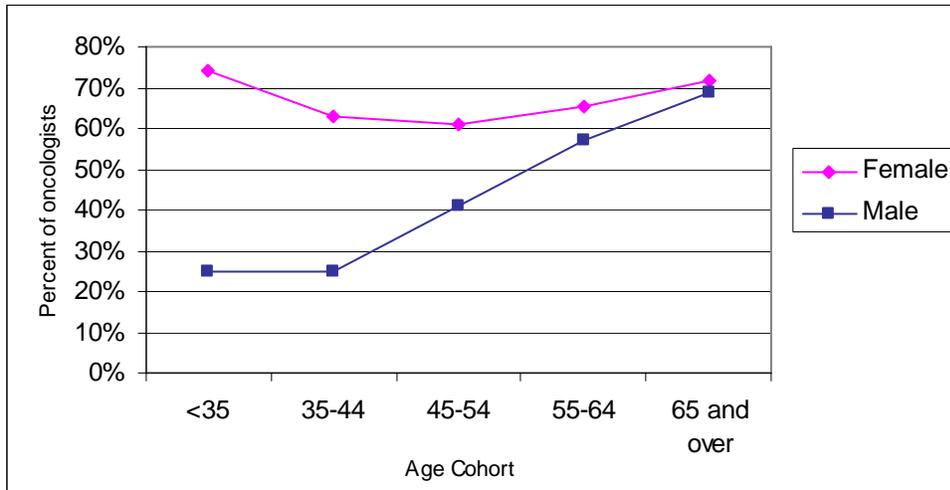
Table 5: Availability of and interest in part-time hours

Availability of Part-time Work Hours	Percent
Available, and I currently work part time	8%
Available, and I am considering this for the future	13%
Available, but I am not interested	21%
Not available, but I would like this option	27%
Not available, and I would not be interested if they were	31%

Source: 2006 Survey of Clinical Oncologists

Figure 14 shows that females are more likely to be interested in part-time hours or to be working part-time. As age increases, males become increasingly interested in part-time hours and by the time they reach the 65 and over age cohort, their interest is comparable to that of their female peers.

Figure 14: Percentage interested or currently working part time by gender



Source: 2006 Survey of Clinical Oncologists

Table 6 shows the mean percentage of time spent in patient care, research, teaching, administration, and other professional activities by setting. While private practice oncologists spend 90% of their time on patient care activities, those in academics only spend 54% of their time on patient care, due to teaching and research responsibilities.

Table 6: Mean percentage of time in professional activities by practice setting

	Principal Work Setting					
	Academic	Private Practice	Government	Industry	Other	Total
	Mean	Mean	Mean	Mean	Mean	Mean
Oncology/malignant hematology patient care	47.2	75.7	46.7	4.5	63.6	63.4
Non-oncology-related patient care	6.6	14.4	11.7	.5	13.2	11.4
Clinical research	13.6	2.9	13.9	71.4	5.5	8.5
Laboratory/basic research	12.3	.2	6.5	3.3	1.2	4.4
Teaching/fellowship program activities	9.6	1.7	9.2	1.2	3.2	4.5
Administration/leadership	9.9	4.4	10.4	13.6	11.7	7.0
Other	1.1	.5	.4	2.8	1.6	.8

Source: 2006 Survey of Clinical Oncologists

Variation in Visit Counts by Practice Setting, Age, and Gender

Analysis of the 2006 Survey of Clinical Oncologists reveals significant variation in the mean visits per week by practice setting, age, and gender. Private practice physicians have higher visit-rates than do those in academic settings. A clear difference exists in visit-rates for physicians aged 45-64 than for those who are in the younger and older cohorts. Gender variation is significant as well, though only in the private practice setting where, on average, males have higher visit-rates than do females. Table 7 shows the variation for medical oncologists and hematologist/oncologists only.

Table 7: Variation in visit-rates for medical oncologists and hematologist/oncologists, by practice setting, age and gender

		Academic	Private Practice	Other
	Age Group	Mean Visits per Week (s.e.)	Mean Visits per Week (s.e.)	Mean Visits per Week (s.e.)
Male	45-64 years	63.9 (4.7)	103.1 (2.3)	81.2 (2.9)
	Not 45-64	44.5 (3.1)	83.9 (3.0)	72.9 (5.4)
Female	45-64 years	55.5 (6.3)	90.6 (4.7)	76.5 (5.7)
	Not 45-64	39.4 (4.2)	70.5 (4.1)	57.5 (5.0)

Source: 2006 Survey of Clinical Oncologists

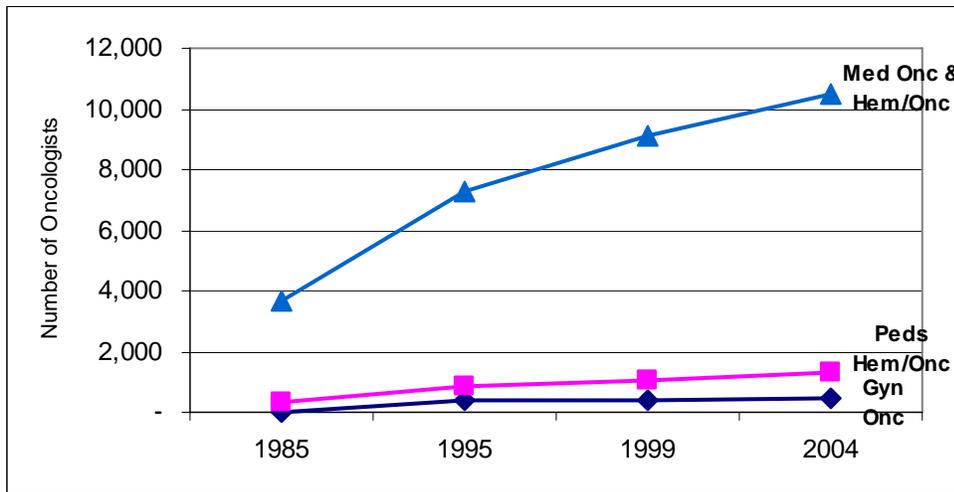
Historical Trends

Data from the American Board of Internal Medicine (ABIM), American Board of Obstetrics and Gynecology (ABOG), and from the AMA's *Physician Characteristics and Distribution in the U.S.* illustrate that the oncologist workforce has increased 200% percent over the past 18 years (see Figure 15). In 1986, there were approximately 4,018 oncologists, according to the ABIM and PCD. As of 2004, there were 12,302.

In the previous two decades, approximately 3000 physicians per decade received board certification in medical oncology. Between 2000 and 2005, 2,500 received board certification, and if this trend remains steady for the balance of the decade, there will be a 40% increase above 1990 levels (see Figure 16). ABIM data on the number of first-year fellowships shows that the

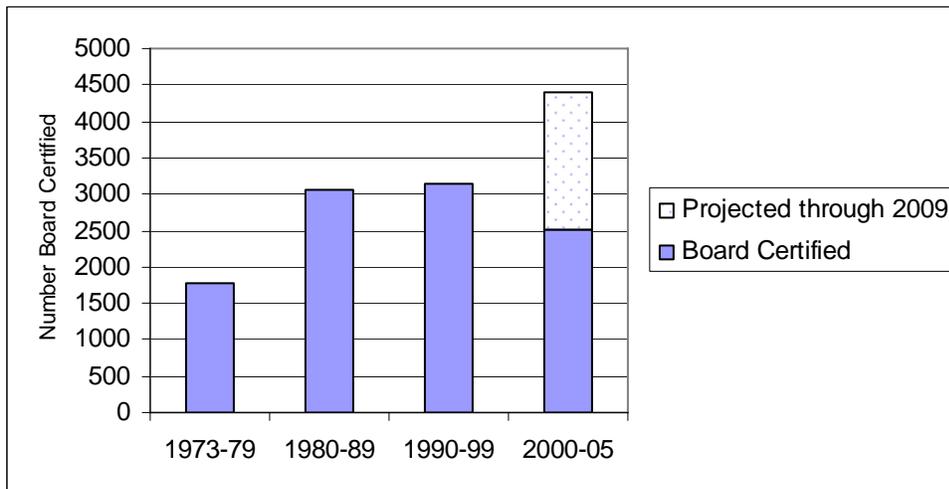
number entering oncology training has only increased by 27% over the past decade – which leaves some unexplained growth in the number of board certifications. This could be explained by older physicians deciding to pursue board certification later due to pressures from employers or from other external factors.

Figure 15: Growth in the number of oncologists, 1985-2004



Source: ABIM Board Certification Data; Physician Characteristics and Distribution in the U.S., 1986, 1996-1997, 2001-2002 and 2006 Editions

Figure 16: Number board certified in medical oncology, 1973-2005

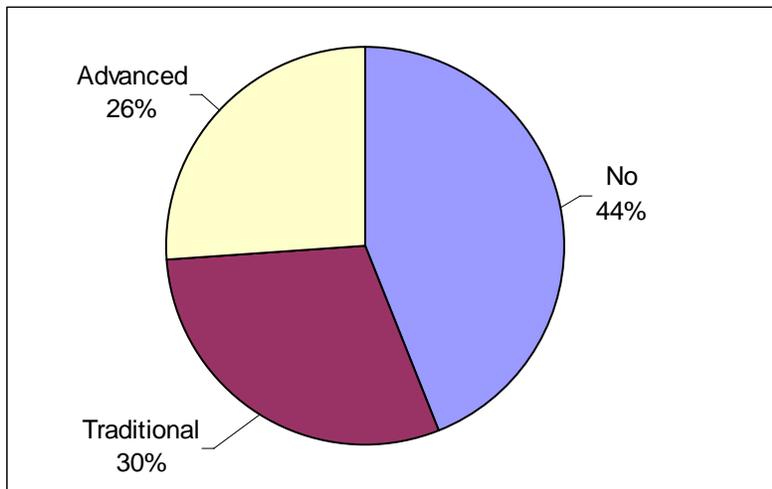


Source: ABIM Board Certification Data. 2005 rates applied to years 2006-2009 to project certification rates through 2009.

Use of Nurse Practitioners and Physician Assistants

In the 2006 Survey of Clinical Oncologists, 56% of respondents indicated that they work with nurse practitioners and/or physician assistants. 30% use NPs/PAs mainly for the traditional scope of practice, such as patient education and counseling, pain and symptom management, and to manage patients during visits. 26% regularly use NPs/PAs for more advanced procedures such as assisting with new patient consults, ordering routine chemotherapy, or performing invasive procedures (see Figure 17). This will be important for modeling scenarios where more oncologists use NPs/PAs for both traditional and advanced activities. The survey data reveal that those who work with NPs/PAs have higher visit-rates than the 44% who report not working with NPs/PAs at all.

Figure 17: Percent of oncologists for whom NPs/PAs provide traditional or advanced (regularly assist with new patient consults, order routine chemotherapy, or perform invasive procedures) patient care activities



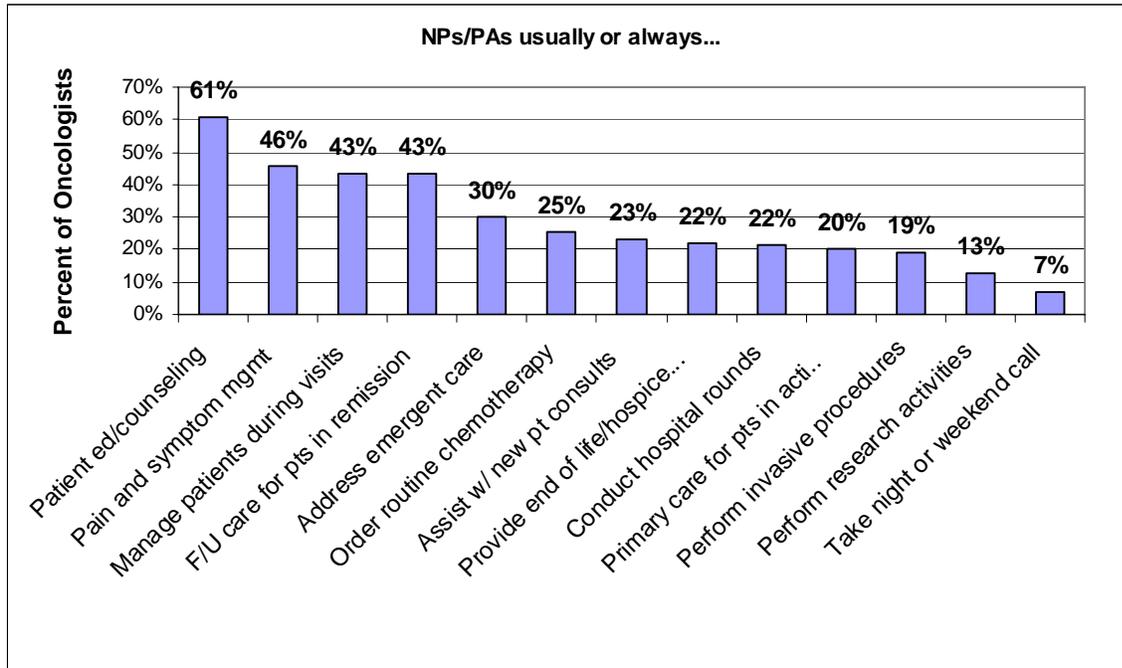
Source: 2006 Survey of Clinical Oncologists

Figure 18 shows the percentage of oncologists who work with NPs/PAs who usually or always perform the various listed patient care and research-related activities. Patient education is the highest (61%), and taking night and weekend calls is the lowest (8%).

Over two-thirds of those who use NPs/PAs clearly believe that it benefits the practice in many ways, such as improving efficiency, allowing physicians to spend more time on complex cases, improving overall patient care, and contributing to the physicians' professional satisfaction,

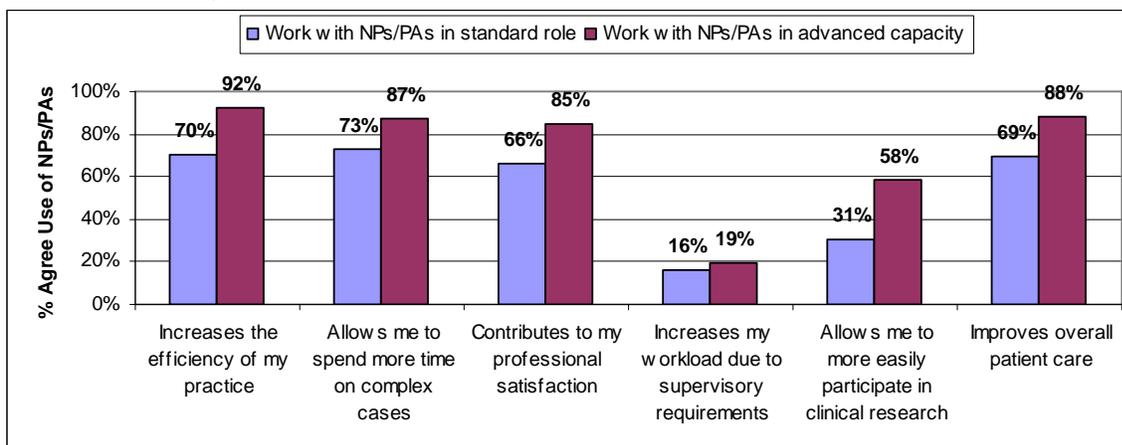
without overly increasing their workload (see Figure 19). Those who regularly use NPs/PAs for advanced activities are even more likely to agree with these statements.

Figure 18: Percentage of oncologists who work with NPs/PAs who ‘usually’ or ‘always’ perform the following patient care activities



Source: 2006 Survey of Clinical Oncologists

Figure 19: Physician agreement with statements regarding how use of NPs/PAs improves efficiency, patient care and physician satisfaction, by oncologists’ level of use of NPs/PAs in their practice (standard or advanced activities)

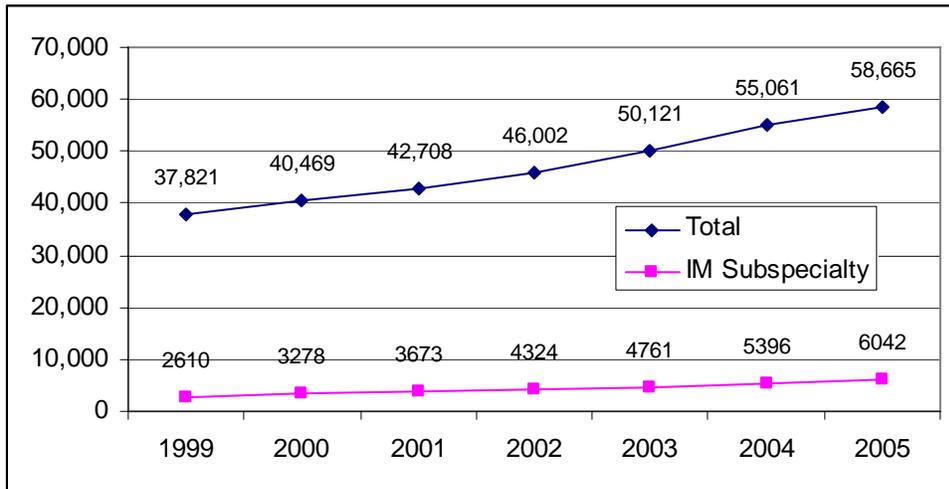


Source: 2006 Survey of Clinical Oncologists

Figures 20 and 21 show there has been steady growth in the number of nurse practitioners and physician assistants. Between 1999 and 2005, the number of PAs grew by 55%. The American

Academy of Physician Assistants projects the PA workforce will grow another 49% between 2005 and 2014. In 2005, only 10% of physician assistants practiced in an internal medicine subspecialty.

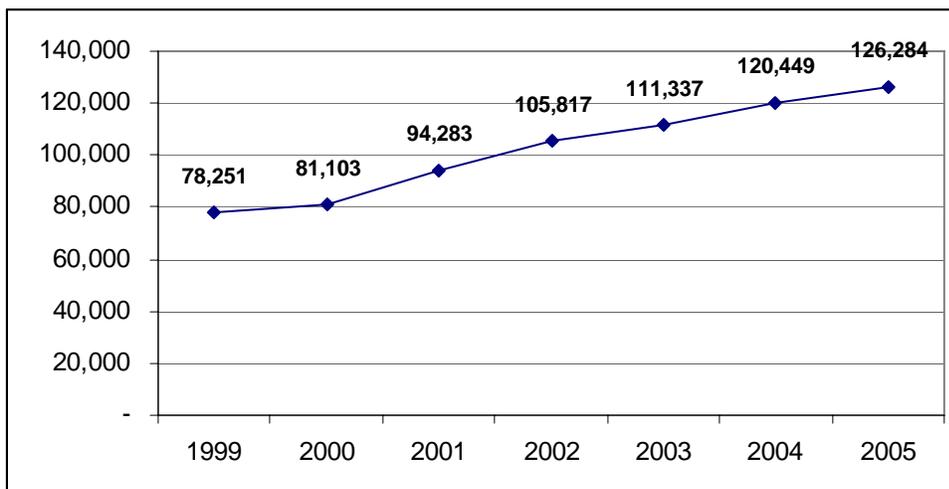
Figure 20: Number of practicing physician assistants, 1999-2005



Source: 1991-1995 AAPA Membership Census Surveys and 1996-2005 AAPA Physician Assistant Census Surveys.

Data published in the *Nurse Practitioner Journal* shows a 61% increase in the number of nurse practitioners between 1999 and 2005 (See Figure 21). The American Academy of Nurse Practitioners' 2004 workforce data indicates that 1% of nurse practitioners specialize in oncology.

Figure 21: Total number of nurse practitioners, 1999-2005



Source: *The Nurse Practitioner Journal*, Vols.# 25-30

Role of Other Specialists

Not surprisingly, oncologists seem to provide the majority of care for patients undergoing active cancer care treatment, as relatively few report that their patients are likely to see other providers during that time. Nearly one-third (31%) of physicians indicated that it is rare for their patients to see a primary care physician while undergoing active cancer care treatments (Table 8). Nearly two-thirds said their patients never or rarely see pain and symptom management specialists or hospitalists. Over half said their patients never or rarely see a palliative care specialist when at the end-of-life, though the vast majority (86%) said their patients usually or always see hospice providers.

Table 8: Use of non-oncologists during active treatment and at end-of-life

While undergoing active cancer care treatment, how often do your patients also see any of the following providers?	Never /Rarely	Sometimes	Usually /Always
Primary care physician	31%	25%	24%
Pain and symptom management specialist	62%	32%	4%
Hospitalist for inpatient care	62%	28%	9%
Social worker/counselor	20%	39%	41%
When at the end-of-life and no longer in active treatment of their cancer, how often do your patients also see any of the following providers?	Never /Rarely	Sometimes	Usually /Always
Palliative care specialist	51%	28%	21%
Hospice	2%	12%	86%

Source: 2006 Survey of Clinical Oncologists

SECTION II: NEW ENTRANTS

In order to determine the number of new entrants into oncology practice, we will focus exclusively on the fellows who complete training in one of following four program areas: medical oncology, hematology/oncology, pediatric hematology/oncology, or gynecologic oncology.

Summary of Findings

- Approximately 613 oncologists completed training in 2005 – 473 in medical oncology or hematology/oncology; 109 in pediatric hematology/oncology; and 31 in gynecologic oncology.
- The number of medical oncology and hematology/oncology slots has increased by 27% over the past decade and pediatric hematology/oncology slots have increased by 47% during the same period. However, results of the Survey of Clinical Oncology Fellowship Program Directors reveals that only 15% of programs have plans to increase between now and the 2010-11 academic year.
- Program directors have concerns about the quality of the applicant pool beyond a 30% expansion. Additionally, they cite two main barriers to increasing enrollment – cost of expansion and availability of financial support for fellows.
- Women are a growing proportion of the oncologist workforce. 48% of the fellows completing training in 2005 were female, whereas only 24% of currently practicing oncologists are female.
- The percentage of international medical graduates (IMGs) in oncology fellowship slots has decreased over the past decade. 32% of the fellows completing training in 2005 were IMGs, which is slightly higher than the percentage of IMGs in the oncology workforce (29%).
- There has been essentially no growth over the past decade in the number of residents entering training in one of the three pipelines to oncology fellowships – internal medicine, pediatrics, or obstetrics/gynecology.

- Half of the new entrants into the oncology workforce will start out in academic settings, and those in academic settings anticipate they will spend half the amount of time on patient care activities than do their counterparts in private practice settings.
- Program directors also report that the number and quality of applicants has increased over the past three years.
- The job market for new entrants is strong as evidenced by the fact that 88% of the 2005 fellows had accepted a position by the end of their fellowship, and two-thirds had their choice of two or more job offers and received one or more sign-on benefits.

The Number of Oncologists Completing Fellowship Training

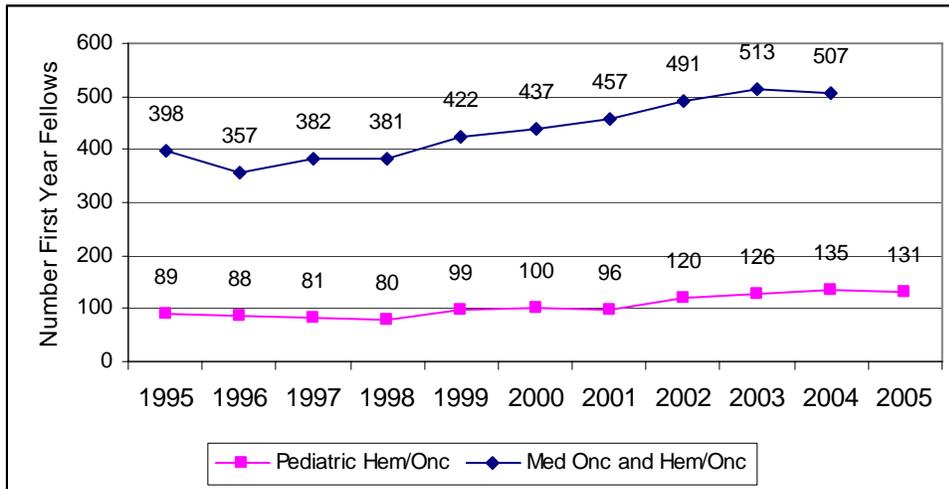
Several sources of publicly available data exist on the number of fellows completing GME training; each is collected in a slightly different manner and has unique strengths and weaknesses. Based on our analysis of the various datasets, we will rely on ABIM data on first time board certification test-takers for our estimate of the number of medical oncologists and hematologist/oncologists entering the workforce. To receive board certification in medical oncology from ABIM, the physician must have proof of receiving fellowship training from an accredited medical oncology or hematology/oncology fellowship program and pass a certification examination. Program directors submit clinical competency evaluations on fellows each year, which serve as proof that a fellow has completed the required training.

First-time board test rates represent one of the major pathways for entering practice in oncology and seem to provide the most accurate and timely source of data on newly trained oncologists. In 2005, 473 physicians took the medical oncology board exam for the first time.²⁶ 109 physicians took the pediatric hematology/oncology board examination and 31 physicians took the gynecologic oncology board examination for the first time in 2005.^{27 28}

Regardless of data source, clearly substantial growth has occurred in the number of fellows entering oncology training over the past decade. The ABIM shows a 27% increase in the number of fellows entering medical oncology or hematology/oncology fellowship programs.²⁹ Data on gynecologic fellowship trends is not available. American Board of Pediatrics data on

the number of fellows entering pediatric hematology/oncology shows a growth of 47% (see Figure 22). However, it appears this growth trend could be slowing significantly based on a 2005 survey of oncology fellowship program directors.

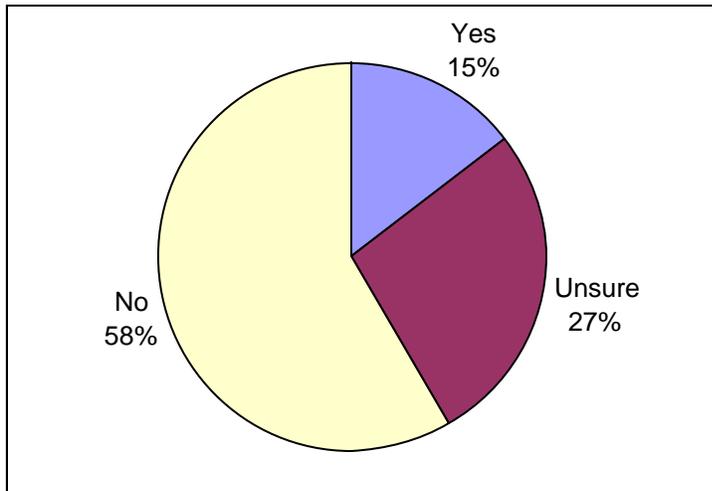
Figure 22: Growth in the number of first-year fellows by specialty,* 1995-2005



*Data on growth of gynecologic oncology programs is not available.
Sources: <http://www.abim.org/resources/trainfellow.shtm>; *Workforce Data: The American Board of Pediatrics, 2005-2006*

When asked about plans to increase training slots in the 2005 Survey of Clinical Oncology Fellowship Program Directors, only 15% of respondents indicated that they have ‘definite’ or ‘probable’ plans to increase the number of training slots available by the 2010-11 academic year (see Figure 23). If 15% of all medical oncology, hematology/oncology, pediatric hematology/oncology, and gynecologic oncology programs increased by 1.5 slots (the mean number of potential new slots per program indicated in the survey), approximately 55 new slots would become available. However, it is important to note this would be less than a 10% increase in total available first-year positions.

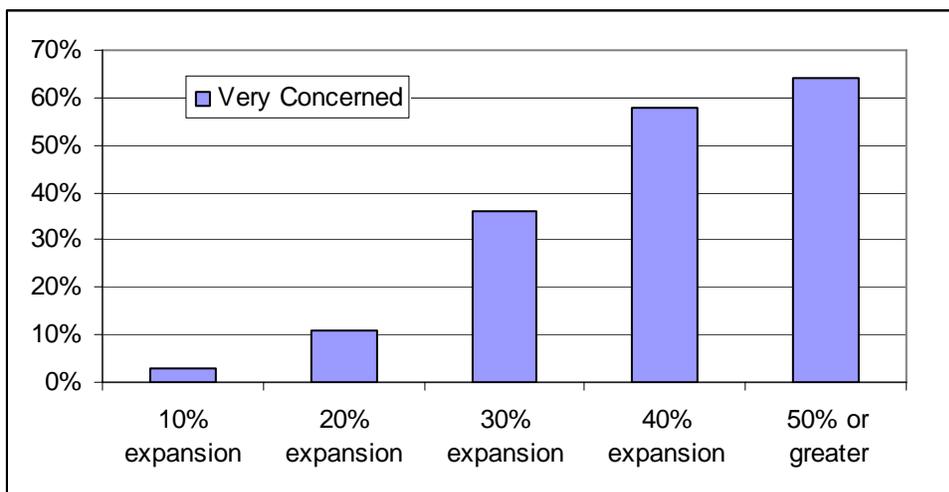
Figure 23: Plans for increasing enrollment between now and 2010-11 academic year



Source: 2005 Survey of Oncology Fellowship Program Directors

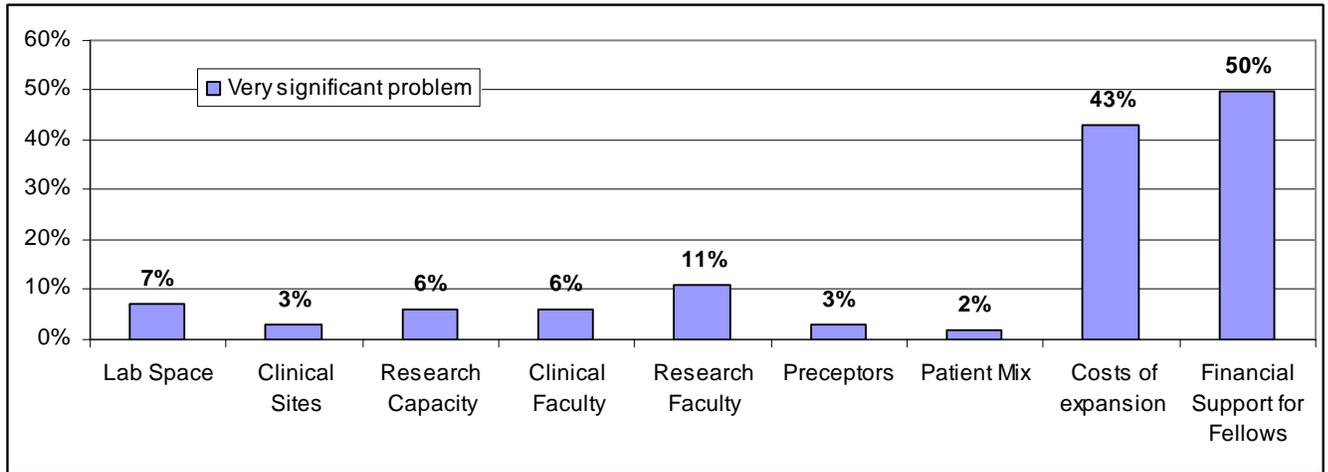
An additional 27% of program directors indicated they were unsure if they would be increasing fellowship slots by 2010-11, and, therefore, the potential increase described could be a conservative estimate. Programs that are on the fence (and even those with no current thoughts about expansion) might be more likely to increase the number of training slots offered if signs point to a future shortage of oncologists. However, program directors become increasingly concerned with the quality of the applicant pool to support growth of 30% or more (see Figure 24). When asked about barriers to expansion, the top two concerns were with the cost of expansion and the funding for fellows (see Figure 25).

Figure 24: Percent of program directors concerned with quality of application pool to support expansion



Source: 2005 Survey of Oncology Fellowship Program Directors

Figure 25: Barriers to increasing training slots

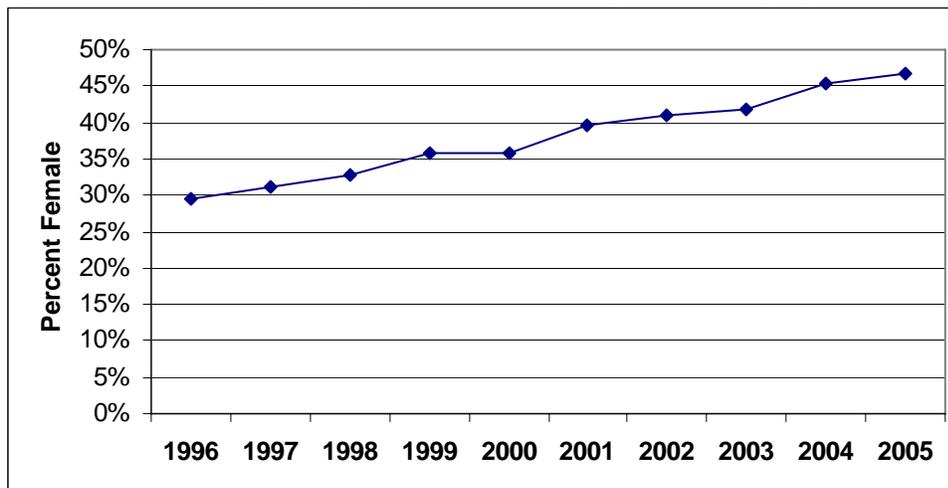


Source: 2005 Survey of Oncology Fellowship Program Directors

Demographics of New Entrants

The demographics of the new entrants to the oncologist workforce are similar to the practicing oncologists – with one notable exception. As with medicine in general, women are a growing proportion of the workforce. While only 24% of practicing oncologists are female, nearly half (48%) of the 2005 fellows completing training are female. Figure 26 shows the growth over the past decade in the percentage of females in oncology. As we will discuss later, this will play an important role in how we forecast future physician supply estimates.

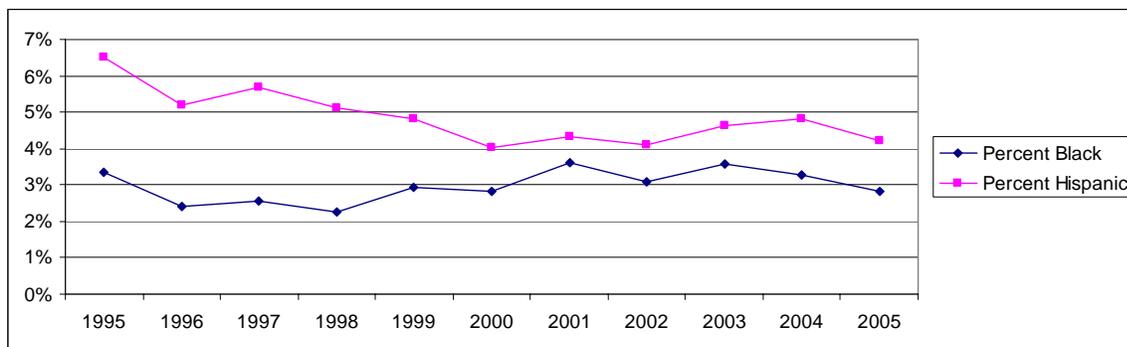
Figure 26: Growth in percentage of females in oncology fellowship programs, 1995-2005



Source: JAMA Med Ed, 1996-2006 (excludes gynecologic oncology)

Unfortunately, the new entrants do not show significant increases in the number of underrepresented minority physicians when compared to the practicing oncologists. In fact, the percent of Hispanics in oncology fellowships has been decreasing over the past decade from 6.6% to 4.1% (see Figure 27). The percentage of Blacks has hovered around 3% (moving above and below) over the past 10 years. These rates are slightly higher than the overall physician workforce, which is 2.3% Black and 3.2% Hispanic.³⁰ From the ERAS data for medical oncology and hematology/oncology, 4% to 5% of applicants are either Black or Hispanic (see Table 12).

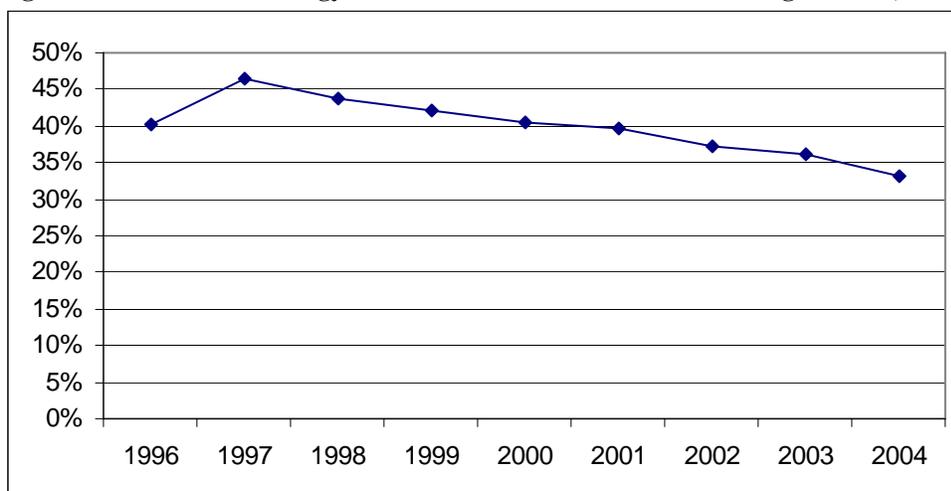
Figure 27: Percent of oncology fellows who are Black or Hispanic, 1995-2005



Source: JAMA Med Ed, 1996-2006 (excludes gynecologic oncologists)

According to the results of the Survey of Clinical Oncology Fellows Completing Training in 2005, just under one-third (32%) of fellows completing training in oncology are international medical graduates (IMGs). The percentage of IMGs in oncology fellowship training is slightly higher than the overall oncologist workforce (see Table 9) and the overall percentages in GME training and in the general physician workforce (which are 27% and 25%, respectively). The percentage of IMGs in oncology has been declining since 1997 (see Figure 28).

Figure 28: Percent of oncology fellows who are international medical graduates, 1996-2004



Source: JAMA Med Ed, 1997-2005 (excludes Gynecologic Oncology)

In the 2005 survey of fellows completing training in oncology, nearly one-third of the IMGs in the exiting fellows survey indicated they have an exchange visitor (J-1, J-2) visa and, in theory, would be expected to leave the country upon completion of training. However, the survey shows that nearly all of those with exchange visitor visas will be practicing oncology in the U.S. and only half said they would be practicing in Health Professional Shortage Areas (HPSA).

Table 9: Demographic characteristics of oncology fellows entering and completing training and of practicing oncologists

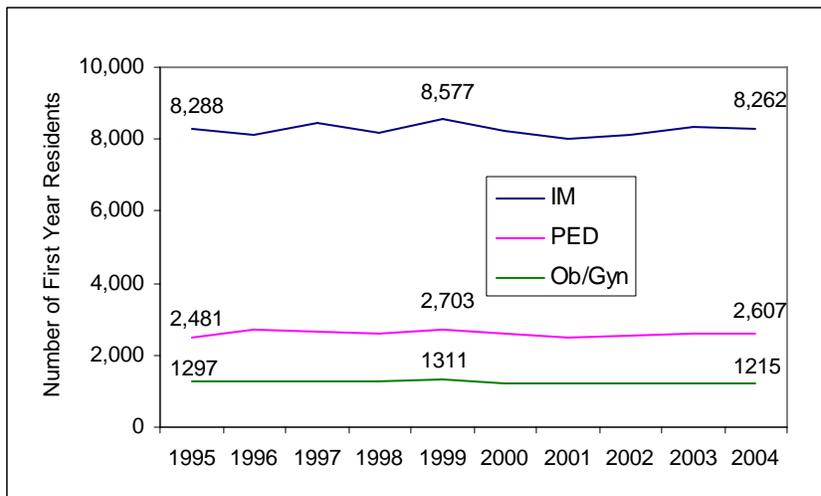
Demographics of Oncologists		Fellows Completing Training 2005	Fellows Entering Training 2006	Practicing Oncologists
Gender	Male	52%	51%	76%
	Female	48%	49%	24%
Medical Education	US / Canada MD	64%	62%	69%
	US DO	4%	3%	2%
	International Medical Graduates	32%	35%	29%
Age	<35	52%	81%	3%
	35 – 44	45%	18%	26%
	45 – 54	3%	1%	34%
	55 – 64	0%	1%	27%
	65 and over	0%	0%	10%

Sources: 2005 Survey of Oncology Fellows Completing Training; 2006 Survey of Oncology Fellows Entering Training; AMA Physician Masterfile, January 1, 2005

Pipeline

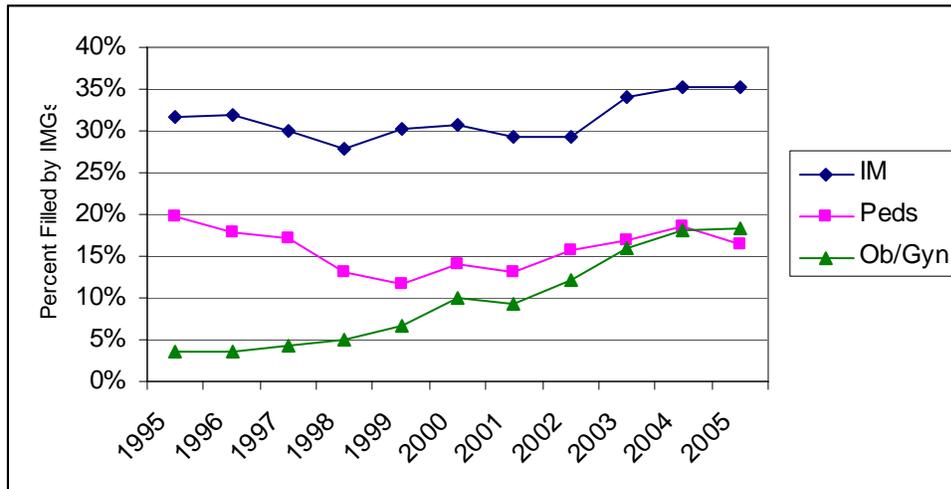
The pipeline of potential oncology fellows is dependent on the number of residents who complete training in one of three pathways to entering oncology fellowship training: internal medicine, pediatrics, and gynecology. The number of residents entering training programs in these areas has been relatively flat over the past decade, while the percentage of IMGs in internal medicine and ob/gyn residency programs has increased (see Figures 29 and 30). Oncology is competitive with other internal medicine subspecialties in terms of the percentage of U.S. medical graduates who enter fellowship training, such as endocrinology (66%) and cardiology (68%), although gastroenterology (75%) is higher.³¹

Figure 29: Number of first-year internal medicine, pediatric and ob/gyn residents, 1995-2004



Source: JAMA Med Ed, 1996-2005

Figure 30: Proportion of first-year internal medicine, ob/gyn, and pediatric residency positions filled by IMGs, 1995—2005



Source: JAMA Medical Education Issues, 1996 to 2005

Work Effort of Entering Oncologists

It is unclear whether younger oncologists will have different lifetime productivity than the previous generation of oncologists, although anecdotal evidence, as well as some of the findings from our surveys, point in that direction.

Based on results of the survey of fellows completing training and the survey of currently practicing oncologists, it appears that new oncologists will work the same number of hours per week as practicing oncologists. However, the Survey of Clinical Oncologists shows that productivity (as measured in visits per week) is lower for physicians under 45 than it is for those aged 45-64. What we cannot tell from the survey is if variation in productivity is generational or simply age-specific. Will the younger physicians increase their productivity when they age into the 45-64 cohort?

It is clear from the survey of fellows completing training that balancing work and home life is an important goal for new physicians. When asked to rate the importance of various factors in deciding post-training practice plans, 60% of respondents rated balancing home and personal life as extremely important. Table 10 shows the top five rated factors. To give this some perspective, only 20% rated salary/pay as extremely important.

Table 10: Factors most likely to be rated "extremely important" in determining post-training plans

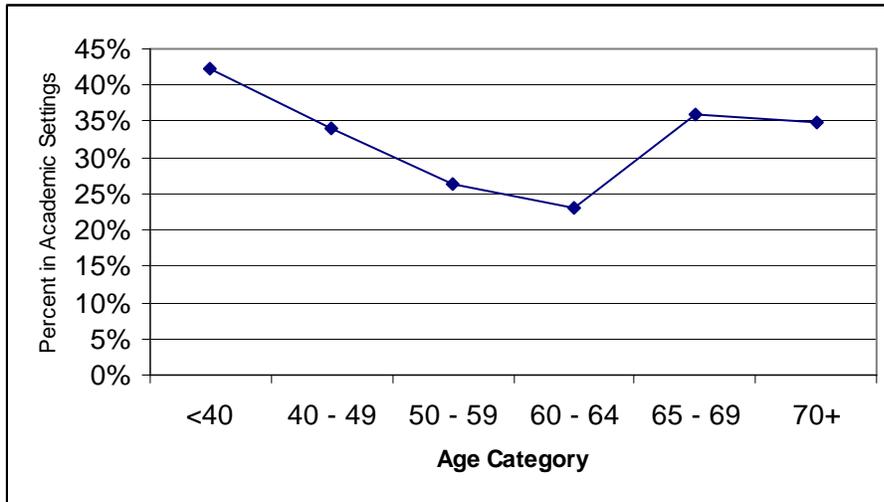
Top Factors in Determining Post-Training Plans	Percent Who Rated Factor "Extremely Important"
Opportunities to provide direct patient care	63%
Geographic location	62%
Network of high quality peers	60%
Opportunity to balance work and professional life	60%
Spousal/partner employment opportunities	50%

Source: 2005 Survey of Oncology Fellows Completing Training

Patient Care Activities

Practice setting is another important determinant of patient care activities and will need to be factored into workforce projections. According to the Survey of Clinical Oncology Fellows Completing Training in 2005 and the Survey of Clinical Oncology Fellowship Program Directors, about half of new oncologists go into academic settings immediately after completing training and the other half go into a private practice setting, with only a handful going directly into government or industry. This varies by specialty, with closer to three-fourths of pediatric hematologist/oncologists and gynecologic oncologists going to work in academic settings immediately following training. The Survey of Clinical Oncologists shows that as age increases, the likelihood of working in an academic setting decreases, although it increases again for those aged 65 and older (see Figure 31). Many physicians who start out in academics are likely to transition into private practice, whereas few undertake the reverse route of starting in the private practice setting and then moving into academics.

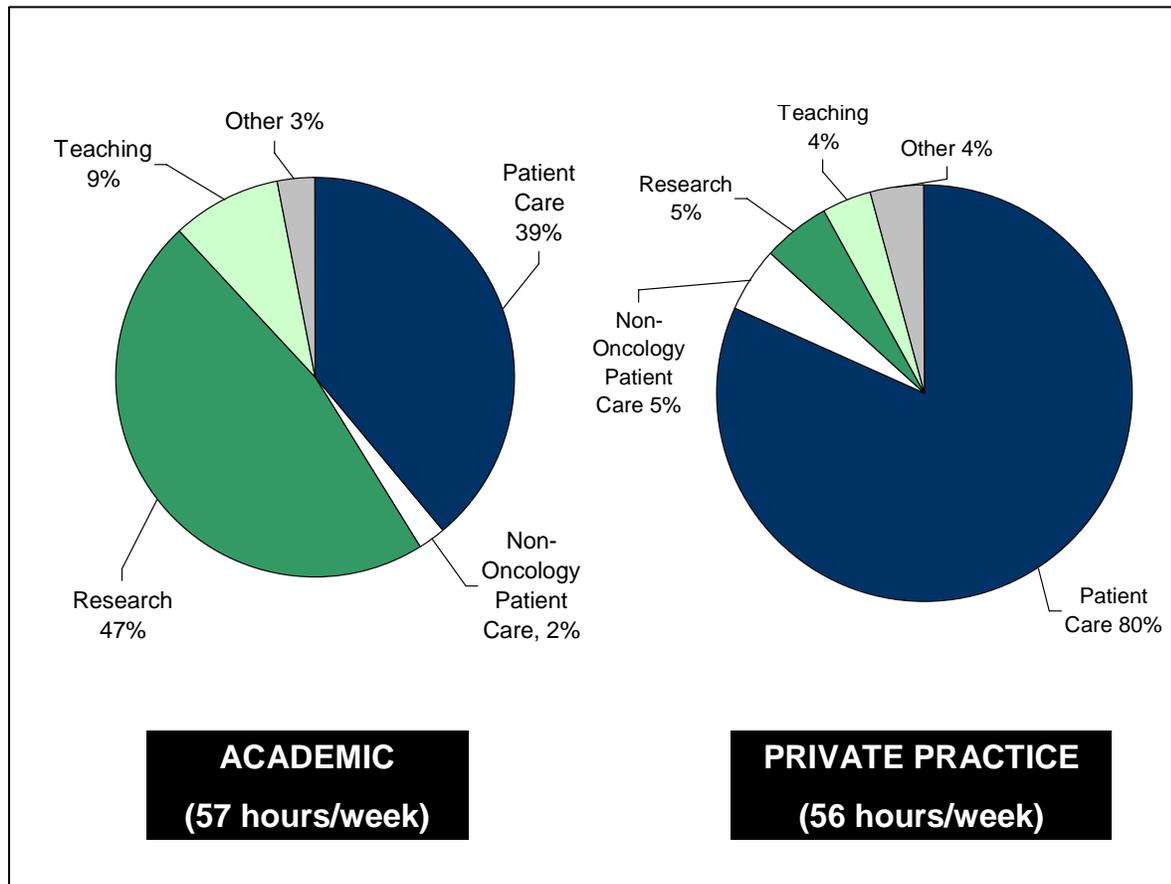
Figure 31: Percentage of practicing oncologists in academic settings, by age



Source: 2006 Survey of Clinical Oncologists

Results of the Survey of Clinical Oncology Fellows Completing Training in 2005 reveal that academics spend half the amount of time on patient care activities than do their counterparts in the private practice setting. Figure 32 shows the distributions by setting. While the number of hours worked per week is fairly similar for both groups, those going into academics anticipated spending 39% of their time on oncology-related patient care activities whereas private practice oncologists anticipated spending double that amount of time. Findings from the Survey of Clinical Oncologists show similar distributions by setting.

Figure 32: Variation in Anticipated Professional Activities by Practice Setting



Interest in the Specialty

According to the Survey of Clinical Oncology Fellowship Program Directors, there is strong and growing interest in oncology fellowships, as evidenced by many applications (108) each program received on average for the 2006-07 academic year and because half of the program directors (50%) said the number of applicants has increased over the past three years. ERAS data for the 2007-08 academic year shows that a significant number of applicants to medical oncology and hematology/oncology programs will not be accepted (see Table 11).

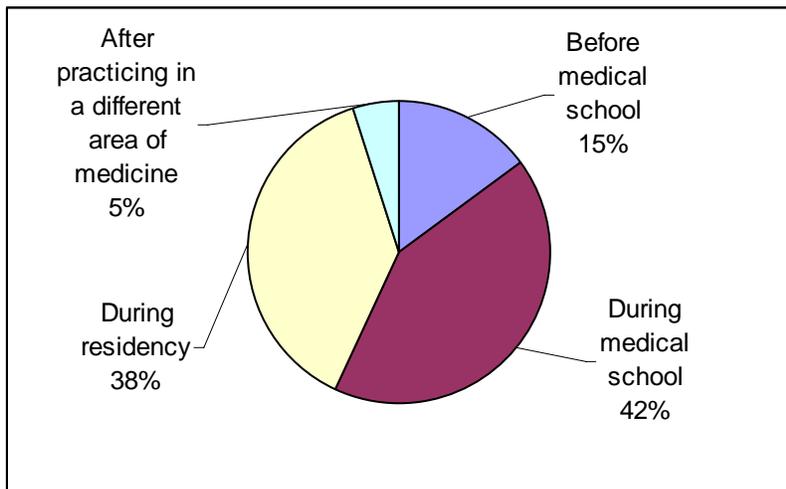
Table 11: ERAS application data and NRMP match data for the 2007-08 academic year

	# of Participating Programs	NRMP Active Positions	Number of Applicants	Percent Female	Percent IMG	Percent Black	Percent Hispanic
Medical Oncology	13	49	490	41%	60%	4.5%	4.7%
Hematology /Oncology	115	385	872	42%	59%	4.9%	3.9%

Sources: ERAS 2004-2006 Statistics for Fellowship Specialties; NRMP Match Results Statistics – Match Day June 21, 2006, Appointment Year 2007

However, it is important to note that on the 2006 Survey of Fellows Entering Oncology Fellowship Programs, 60% indicated that they seriously considered pursuing other specialties before deciding on a career in oncology – 42% of whom contemplated staying in general practice and 58% considered pursuing other internal medicine, pediatric, or gynecologic subspecialties instead of oncology. The top three subspecialty contenders were cardiology, gastroenterology, and infectious diseases. Only 15% had already decided to pursue a career in oncology before entering medical school (see Figure 33). Entering fellows also indicated that mentors from medical school and residency programs provided the most valuable information in helping them decide on a career in oncology. Therefore, there are multiple opportunities to reach potential fellows and highlight the career opportunities in oncology, such as ease of finding employment, income opportunities, and high levels of overall career satisfaction. Data on practice income for oncologists and results of the 2006 Survey of Clinical Oncologists show that oncologists are paid well and are generally satisfied with their careers and income.

Figure 33: When entering fellows decided to pursue a career in oncology



Source: 2006 Survey of Fellows Entering Oncology Fellowship Programs

Job Market

According to the 2005 Survey of Fellows Completing Training, the job market is strong. 88% of those who started their job search had accepted a position by the end of their fellowship training and two-thirds of those had their choice of two or more offers. Over half of those going into private practice had starting incomes of \$200,000 or more. Those going into academics will earn significantly less, with over three-fourths reporting a starting salary of under \$150,000. 69% of those who received a job offer also reported receiving one or more of the following sign-on benefits: moving expenses (52%), cash incentive (24%), practice support (14%), or loan assistance (5%).

SECTION III: RETIREMENTS

Modeling physician supply into the future requires an understanding of expected retirement rates. There is relatively little research on physician retirement patterns, therefore this section will focus on what was learned through analysis of the Survey of Practicing Physicians.

Summary of Findings

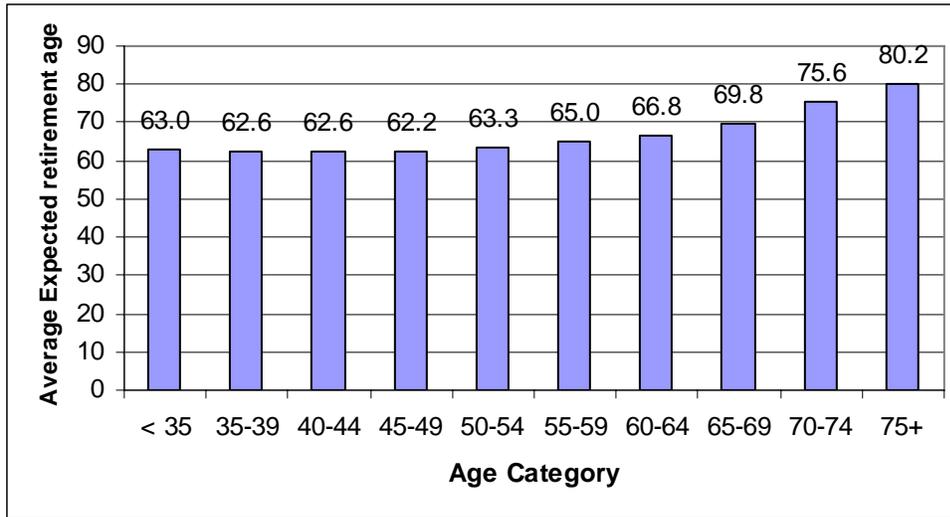
- The mean expected age of retirement for currently active oncologists is 64.3 years. Oncologists that are still active past 65 expect to retire within 3-4 years.
- Oncologists aged 65 and older and still active in medicine are more likely to work part time and are more likely to be very satisfied with their career in medicine.
- Oncologists that report feeling burned out from work or frustrated once a week or more have lower years until expected retirement and plan to retire at younger ages than those who report being frustrated or burned out more often.

Background on Physician Retirement

Roughly 76 million baby boomers will leave the workforce between 2008 and 2030.³² This is an area of particular concern because 53% of active physicians (excluding residents and fellows) in the United States are age 50 or older. There is anecdotal and some limited empirical evidence that doctors are retiring earlier than in previous years, and it is projected that the U.S. physician-to-population ratio is projected to peak at the end of the coming decade, and then begin to fall.³³

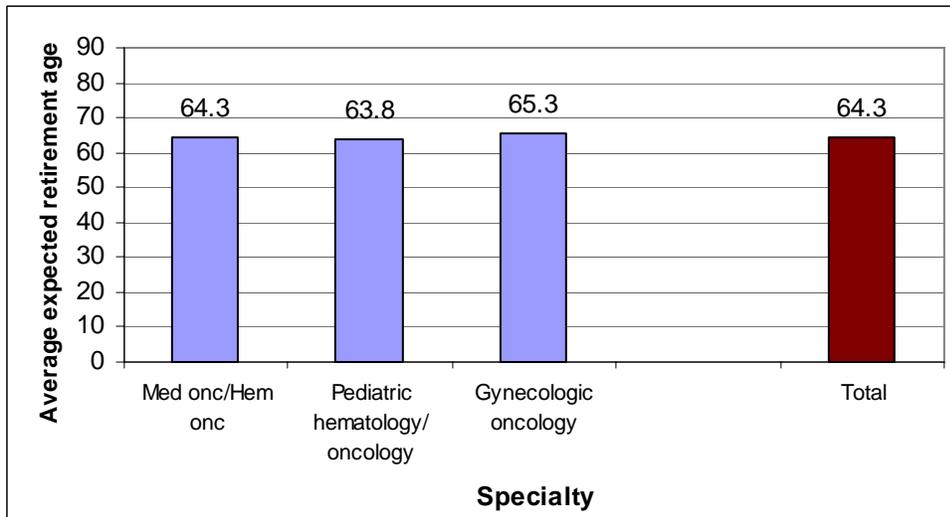
The Survey of Clinical Oncologists asked the age at which practicing oncologists expected to retire. Overall, the average age at which practicing oncologists expected to retire was 64.3 years. Expected retirement age did not vary greatly across age groups (Figure 34) until beyond age 64, where they rose dramatically. Across the oncology specialties, expected retirement age ranged between 63.8 years for pediatric hematology/oncology and 65.3 years for gynecologic oncology (Figure 35).

Figure 34: Average expected retirement age by age group



Source: 2006 Survey of Clinical Oncologists

Figure 35: Average expected retirement age by specialty

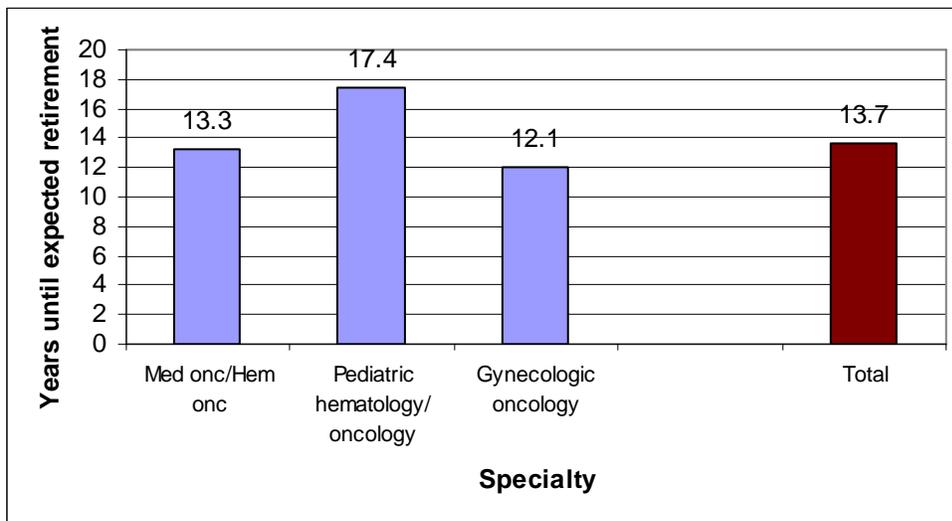


Source: 2006 Survey of Clinical Oncologists

Another way to examine the information collected from practicing oncologists is to combine it with other information. Number of years until expected retirement is calculated by coupling practicing oncologists' age with expected retirement age. Overall, the average number of years until expected retirement was 13.7 among practicing oncologists. Across oncology specialties,

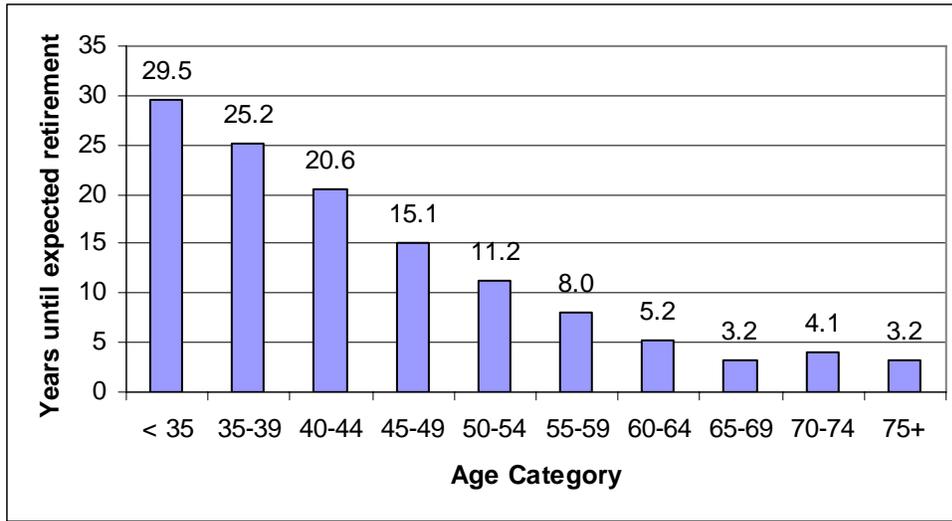
number of years until expected retirement varied somewhat at 17.3 years and 12.1 years, respectively for pediatric hematologist/oncologists and gynecologic oncologists (Figure 36) reflecting the variation in age among the specialties. Figure 37 shows the pattern of expected years until retirement across age groups. The flattening of the curve at the older end of the age categories shows the transition to part-time work that a number of oncologists pursue. Figure 38 shows the percentage of oncologists practicing part time by age. Older oncologists are more likely to work in part-time positions than younger oncologists, with more than half of the oncologists 70 years of age and older working part time.

Figure 36: Average years until expected retirement by specialty



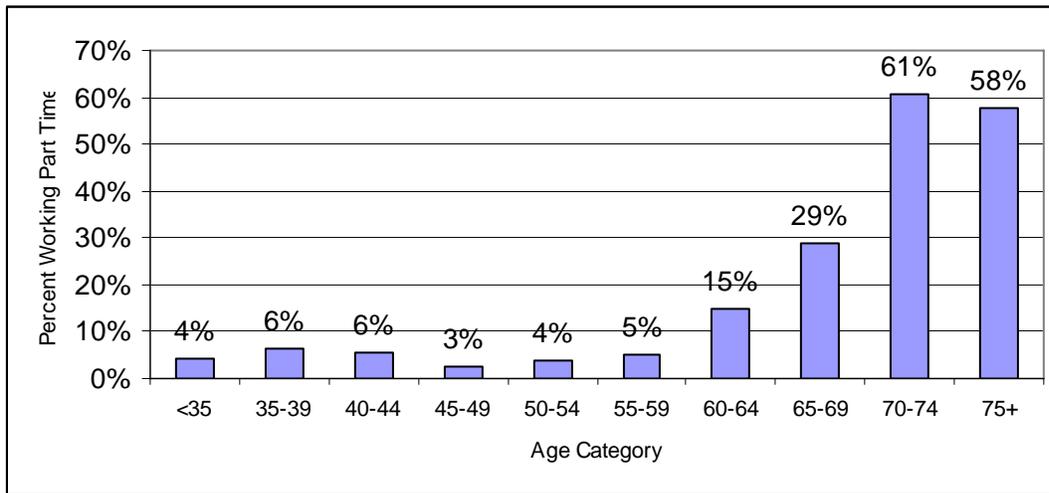
Source: 2006 Survey of Clinical Oncologists

Figure 37: Average years until expected retirement by age group



Source: 2006 Survey of Clinical Oncologists

Figure 38: Percentage working part time by age category



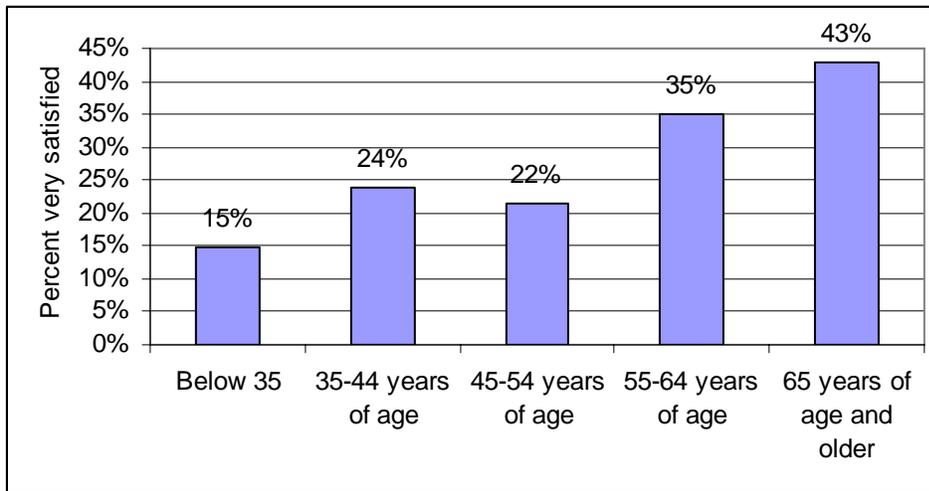
Source: 2006 Survey of Clinical Oncologists

While there is a dearth of information on actual rates of physician retirement, studies and articles on physician satisfaction abound.^{34 35 36 37 38 39 40 41 42 43 44 45 46} These studies are very important in their own right because they offer insight as to what motivates physicians to retire early or leave the medical workforce. The most consistent and crucial finding is that dissatisfied

physicians are more likely to retire, quit, or reduce hours.^{35, 36, 39, 44} One study found that the likelihood of leaving medicine is two to three times greater for dissatisfied physicians.⁴⁰

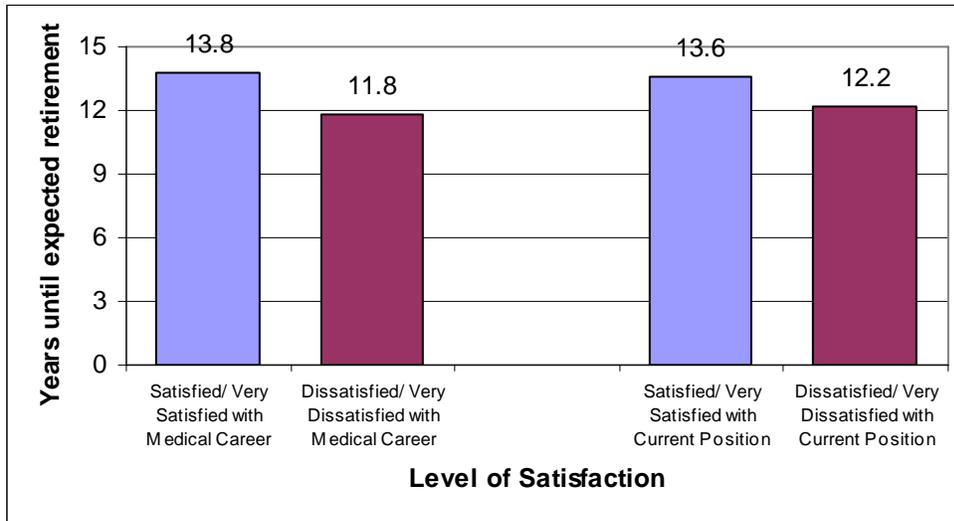
Active oncologists aged 65 and older are much more likely to be very satisfied with their career in medicine (see Figure 39). Similarly, oncologists who are more satisfied report more years until their expected retirement (Figure 40). Figure 41 shows the same relationship between level of satisfaction and average expected retirement age with more-satisfied oncologists reporting older ages of expected retirement.

Figure 39: Satisfaction with career in medicine by age category



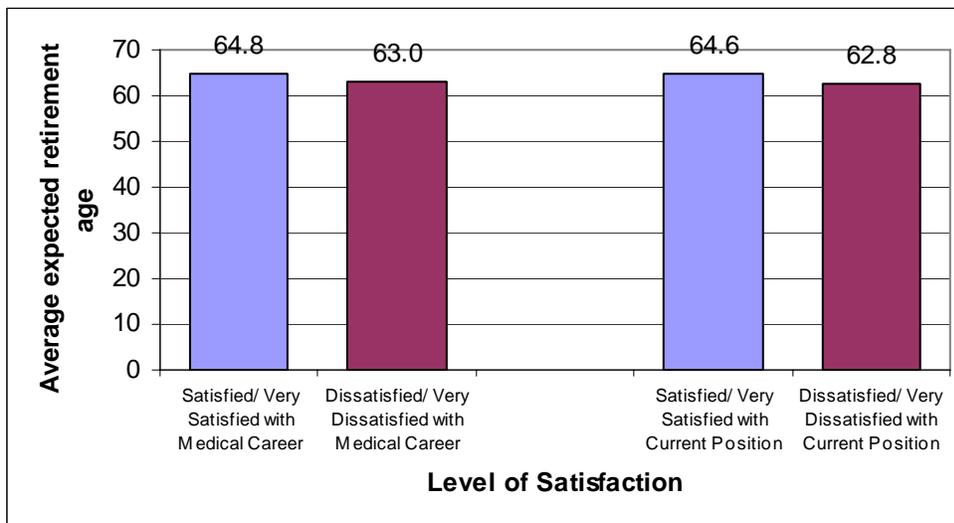
Source: 2006 Survey of Clinical Oncologists

Figure 40: Average years until expected retirement by level of satisfaction



Source: 2006 Survey of Clinical Oncologists

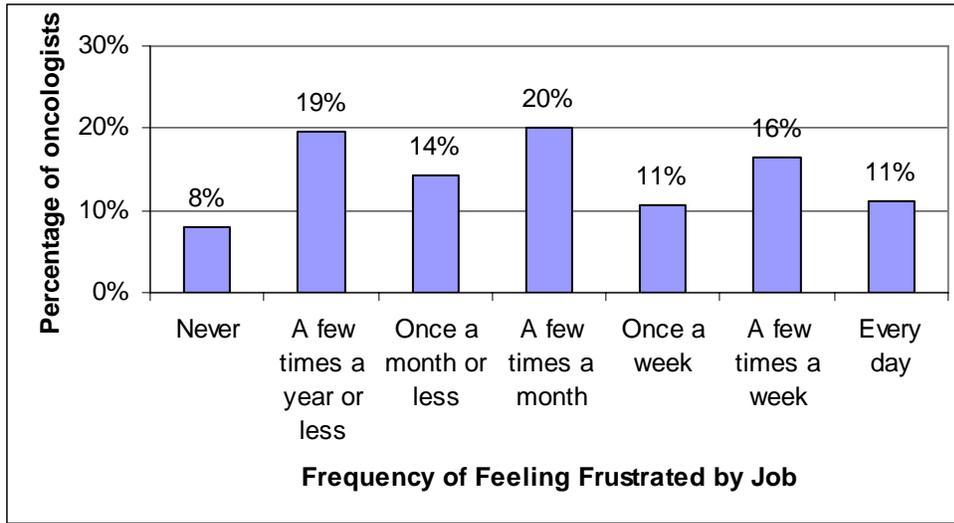
Figure 41: Average expected retirement age by level of satisfaction



Source: 2006 Survey of Clinical Oncologists

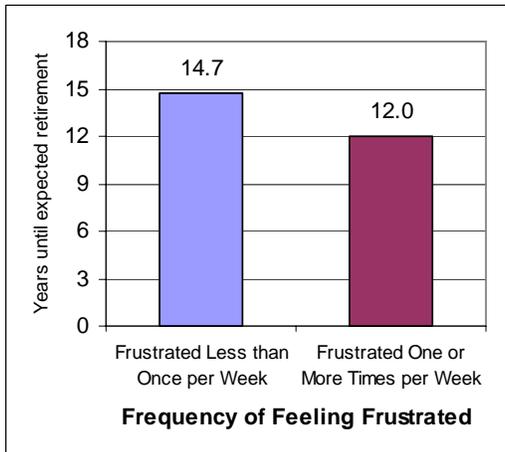
Burnout and stress are important factors in the oncology setting.⁴⁷ Figure 42 shows the frequency of feeling frustration reported by practicing oncologists. More than one-third of practicing oncologists report feeling frustrated by their jobs one or more times per week, with 11% reporting daily frustration. Among practicing oncologists, those who report being frustrated by their job once or more per week have lower years until expected retirement and younger expected retirement ages than those who report being frustrated less often (Figures 43 and 44).

Figure 42: Frequency of feeling frustrated by job



Source: 2006 Survey of Clinical Oncologists

Figure 43: Average years until expected retirement by frequency of frustration



Source: 2006 Survey of Clinical Oncologists

Figure 44: Average expected retirement age by frequency of frustration

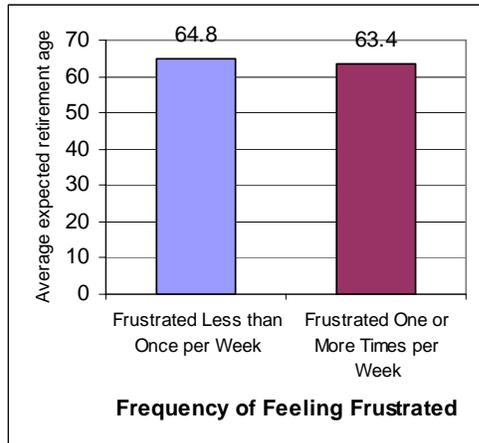
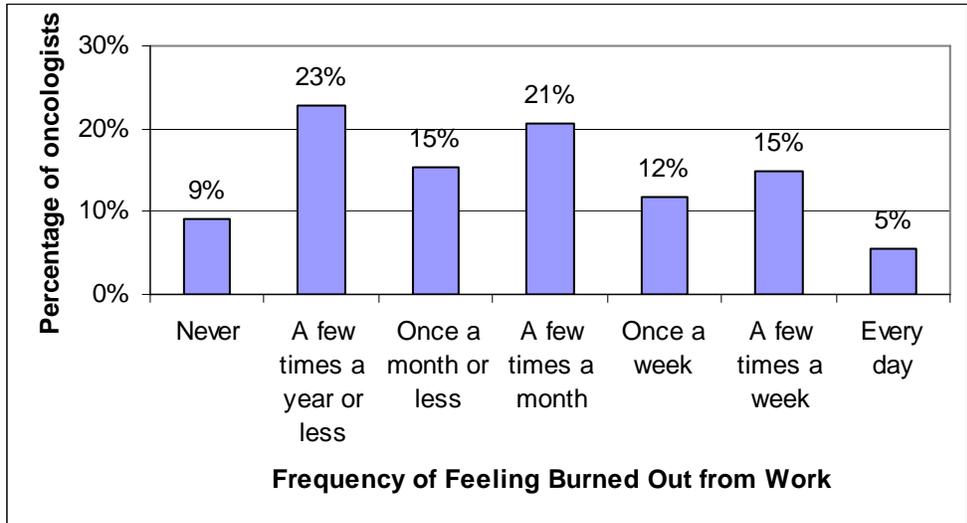


Figure 45 shows the frequency of feeling burned out reported by practicing oncologists. Almost one-third of practicing oncologists report feeling burned out from work one or more times per week. Among practicing oncologists, those who report feeling burned out by their work once or more per week have lower years until expected retirement and younger expected retirement ages than those who report feeling burned out less frequently (Figures 46 and 47). Interestingly,

comments related to burnout centered more on administrative requirements, reimbursement and lack of free time than on emotional issues related to treating patients with cancer

Figure 45: Frequency of feeling burned out from work



Source: 2006 Survey of Clinical Oncologists

Figure 46: Average years until expected retirement by frequency of frustration

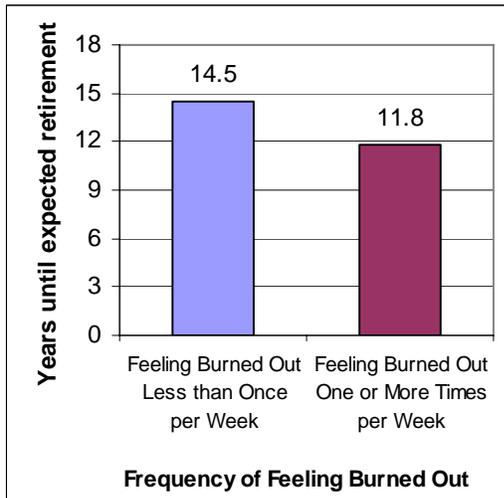
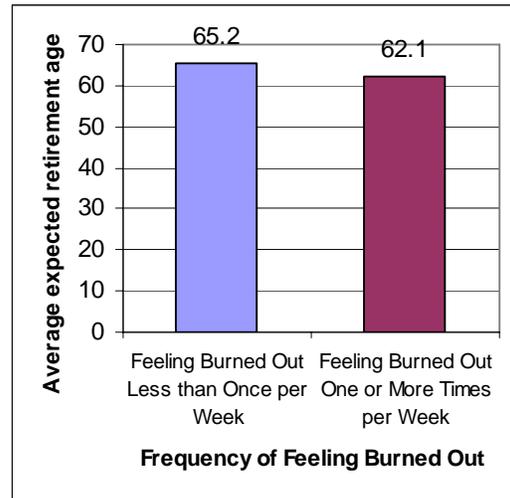


Figure 47: Average expected retirement age by frequency of frustration



Source: 2006 Survey of Clinical Oncologists

Chapter 3: Modeling Supply and Demand Through 2020

This chapter presents details of the baseline oncology physician supply and demand forecasts through 2020. The forecasts presented here include hematologist/oncologists, medical oncologists, and gynecologic oncologists. The units of comparison for both supply and demand are total annual visits to oncologists. The baseline projections assume a continuation of current cancer incidence and prevalence rates and of current practice patterns.

Basic Forecasting Methodology: Supply

$$\text{Supply of Oncologists } Y_1 = \text{Current Supply} + \text{New Entrants} - \text{Retirements/Deaths}$$

The model developed for these forecasts was an age-cohort-flow model. The data informing the model were compiled from a number of sources, including the AMA Physician Masterfile, the ABIM and ABOG board certification data, *JAMA* medical education theme issues; the 2006 Survey of Clinical Oncologists, the 2005 Survey of Physicians Completing Oncology Training in the U.S., and the 2005 Survey of Oncology Training Program Directors.

The model begins by distributing the current active practicing physician supply (2005) across nine age categories, dividing each age category into males and females, informed by the AMA Physician Masterfile and the 2006 Survey of Oncologists. Then, as the number of oncologists is trended forward in time, 503 new entrants are added based on ABIM medical oncology board certification and ABOG gynecologic oncology first-time test-taker rates. The new entrants are assigned to age and gender categories as informed by the 2005 Survey of Oncologists Completing Oncology Training (see Table 12). Oncologists were separated from active practice due to deaths, retirements and other departures from practice.

Table 12: Gender-specific annual entry rates into oncologist workforce

Age Category	Female	Male
30-34	56% (131)	45% (121)
35-39	36% (84)	44% (118)
40-44	5% (12)	7% (19)
45-49	3% (7)	4% (11)
Total	100% (234)	100% (269)

Source: 2005 Survey of Fellows Exiting Oncology Fellowship Training

Mortality rates were based on national age-specific death rates derived from the National Center for Health Statistics.⁴⁸ Practicing oncologists are removed from each gender and age category based on retirement data from the 2006 Survey of Clinical Oncologists (see Table 13). Specifically, the retirement rates are derived from the survey question on expected age at retirement among currently practicing oncologists. Oncologists who remain in the current supply are moved into the next age category when appropriate.

Table 13: Gender-specific 5-year cohort retirement rates

Age Category	Female	Male
30-34	0%	0%
35-39	0%	0%
40-44	0%	0%
45-49	0%	0%
50-54	0%	0.5%
55-59	3.2%	4.7%
60-64	27.7%	14.9%
65-69	32.3%	31.3%
70 and older	62.5%	62.5%

Source: 2006 Survey of Clinical Oncologists

The forecasts produced by the model indicate that the number of oncologists will increase from 10,422 in 2005 to 12,547 in 2020 (see Table 14). Considering the growth in the US population during that period, the oncologist to population ratio will increase from 3.53 per 100,000

population to 3.75 per 100,000 population. While this ratio seems like an increasing supply of oncologists relative to demand between 2005 and 2020, it does not account for the increased percentage of the population that will be aged 65 or older – which is a key factor in a specialty like oncology that primarily treats the elderly. The ratio of oncologists to the 65 and older population will decline 19% between 2005 and 2020.

Table 14: Oncology physician forecasts, 2005-2020

	2005	2010	2015	2020
Total	10,422	11,125	11,904	12,547
U.S. Pop	295,507,134	308,935,581	322,365,787	335,804,546
# oncologists / 100K Pop	3.53	3.63	3.69	3.74
# oncologists / 100K Pop age 65+	28.4	27.64	25.44	22.97
New Entrants	503	503	503	503
Average Age	50.4	49.3	48.4	47.8
Percent Female	22.9%	29.8%	35.1%	39.1%

Conversion of Counts of Oncologists into Total Annual Visits

$\text{Supply of Total Annual Visits}_{Y1} = \text{Supply of Oncologists} \times \text{Mean Visits Provided per Year}$
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To take into account the differences in patient care activity for oncologists based on practice setting, age, and gender, the next step in the forecasts involved converting the number of oncologists into cohort-specific annual number of patient visits. Informed by the 2006 Survey of Clinical Oncologists, the mean number of weekly visits was calculated for each setting, age, and gender cohort (see Chapter 2, Table 7). To compensate for extreme values indicated on the survey, a second mean calculation was performed that excluded cases with more than 200 patient visits per week (approximately 2% of the cases). These mean weekly visit values were then used to generate high and low weekly visit totals for the entire physician population. A 48-week work year was used to generate the total annual visits for the entire population for each year of the forecast. Under these assumptions, the total potential annual visits provided by oncologists

would increase from between 40.2 to 42.5 million to 45.6 to 47.9 million between 2005 and 2020 (see Table 15).

Table 15: Visit capacity of oncologists, 2005-2020

	2005	2010	2015	2020
Total Physicians	10,422	11,225	11,904	12,547
Avg. Weekly Visits (High)	84.89	82.37	80.44	79.48
Avg. Weekly Visits (Low)	80.29	78.19	76.59	75.75
Total Weekly Visits (High)	884,784	924,613	957,596	997,155
Total Weekly Visits (Low)	836,777	877,706	911,758	950,440
Total Annual Visits (High)	42,469,623	44,381,406	45,964,629	47,863,418
Total Annual Visits (Low)	40,165,290	42,129,867	43,764,375	45,621,124

Basic Forecasting Methodology: Demand

$\text{Demand for Total Annual Visits } Y_1 = \# \text{ Cancer Patients} \times \% \text{ See an Oncologist} \times \# \text{ Visits/Patient}$
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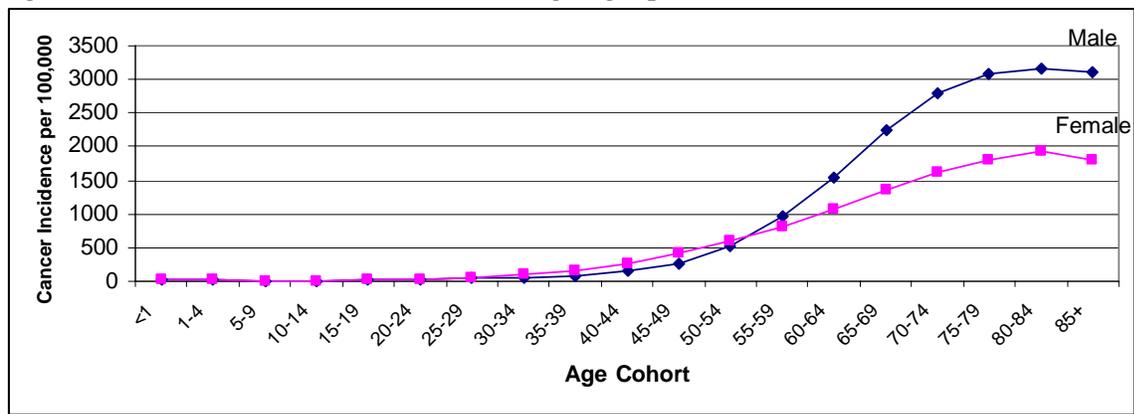
The demand forecasts are based on the forecasts of incident and prevalent cancer cases, as well as the estimated age- and gender-specific oncologist visit-rates for cancer patients developed by the National Cancer Institute (NCI) in July 2006. The NCI's visit-rates were based on analysis of 1998 and 2002 Surveillance, Epidemiology and End Results (SEER) data.

To calculate the estimated number of visits to oncologists that would be demanded by the cancer patient population each year between 2005 and 2020, the incidence and prevalence projections were then applied to the current visit-rate data, also provided by the NCI. To be specific, the projected cancer cases were distributed across 14 age groups by gender and time from diagnosis (i.e., initial 12 months post diagnosis, continuing interval between the initial year and the last year, and the last year of life). The population projections were then multiplied times the visit-rate data, which was also calculated for each age, gender, and time from diagnosis cohort.

Cancer Incidence Rates

The 2005 update to the NCI Cancer Trends Report concludes that the age-adjusted rate of cancer incidence has remained relatively stable since the mid-1990s.⁴⁹ There have been some positive trends (such as the recent reports of decreases in breast cancer incidence) and other less encouraging trends (such as increases in female lung cancers), but the overall cancer incidence rates have remained close to 500 cases per 100,000 people. However, the number of people with cancer is likely to rise dramatically over the next 15 years due to the growth and aging of the population. Prior to age 50, fewer than 500 per 100,000 will develop cancer, but by age 75, the rate for females approaches 2,000 per 100,000, and for males exceeds 3,000 per 100,000 (see Figure 48). This translates into lifetime odds of one out of two males developing cancer and one out of three females developing cancer.⁵⁰

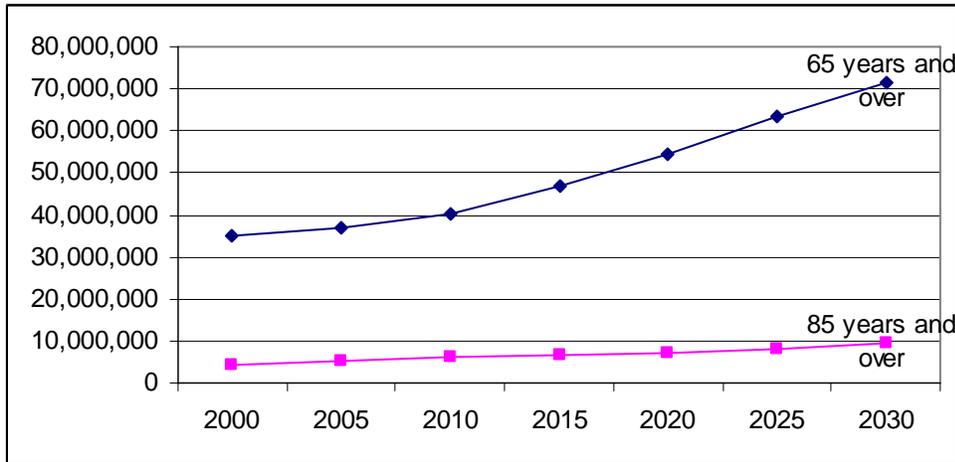
Figure 48: Cancer incident rate increases with age (age-specific cancer incidence rates/100,000)



Source: CDC, Age-Specific Invasive Cancer Incidence Rates by Primary Site and Race, United States (U.S. Cancer Statistics, 2000).

While the U.S. population is projected to increase by only 29% between 2000 and 2030, the number of people aged 65 and older is projected to double from 35 million to 71 million during that same time frame (see Figure 49). This will have a dramatic impact on the number of new cancer cases in the coming years, as cancer is primarily a disease of the elderly.

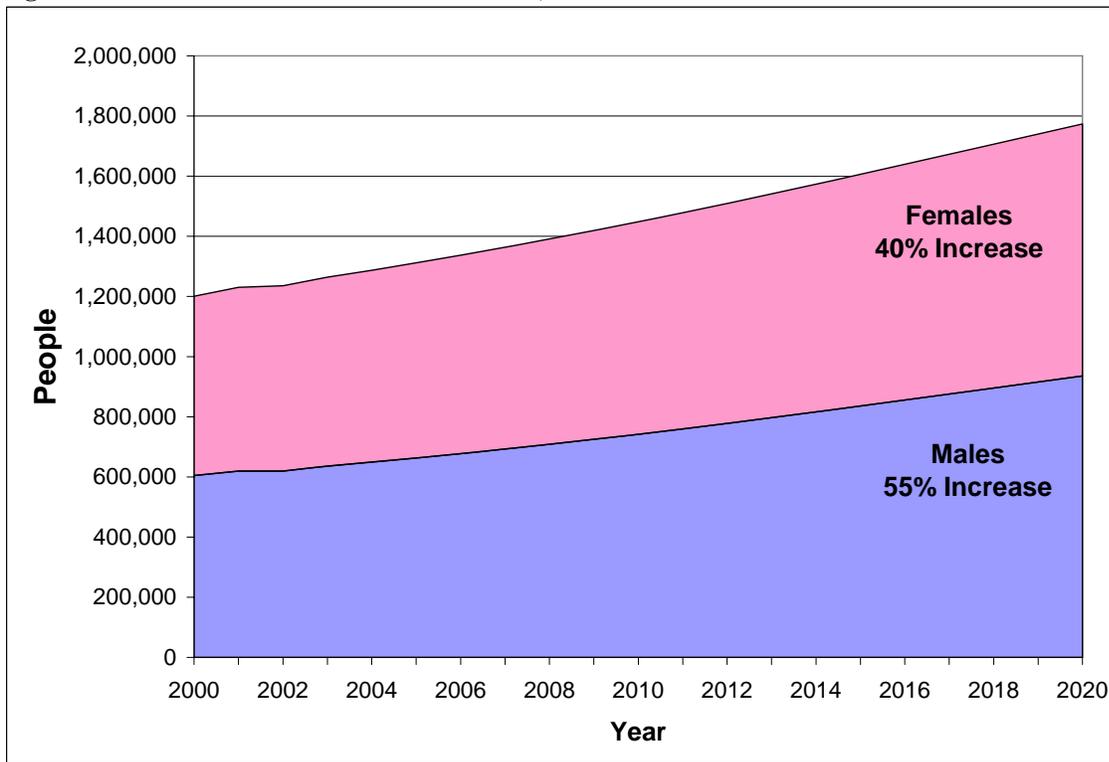
Figure 49: Projected growth of the U.S. population aged 65+ and aged 85+, 2000-2030



Source: U.S. Census Bureau, Population Division, Interim State Population Projections, 2005.

The NCI estimates of cancer incidence rates through the year 2020 (see Figure 50) show that the annual number of new cancer cases will increase by 48% between 2000 and 2020. The incidence and prevalence projections were calculated by applying a three-year average (2000-2002) of age/gender-specific cancer rates to the U.S. Bureau of Census Projections, released March 2004. The incidence and prevalence estimates were based on assumptions of stable rates of cancer incidence and survival from 2002 to 2020.

Figure 50: Annual number of new cancer cases, 2000-2020

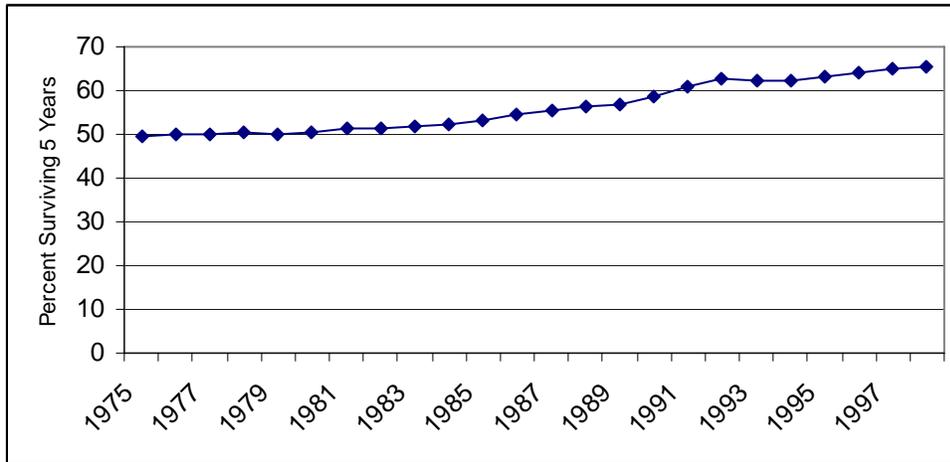


Source: NCI Incidence Projections, July 2006

Cancer Prevalence

Projecting cancer incidence is only part of the equation in calculating demand for oncologist services. The growing population of cancer survivors will need continued monitoring and surveillance to ensure that the cancer is in remission and additional treatment if there is a recurrence. The number of cancer survivors has more than tripled since 1971 when approximately 3 million people were living with cancer.¹ This is largely due to an increase in the five-year survival rate, which has grown from 50% in 1975 to 65% in 1998 (see Figure 51).

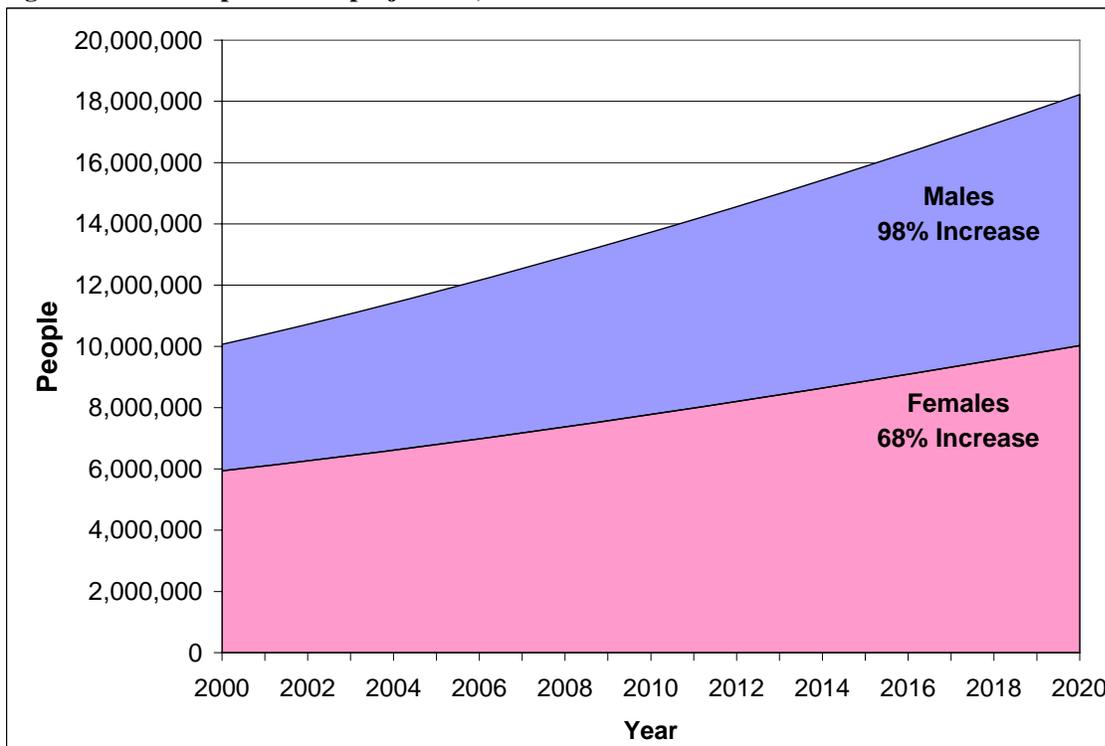
Figure 51: Five-year relative survival rates: 1975-1998



Source: SEER Program, National Cancer Institute. (<http://seer.cancer.gov/registries/terms.html>)

The NCI’s prevalence projections show that overall prevalence will increase by 81% between 2000 and 2020 (see Figure 52). These patients will require continued care and monitoring from oncology specialists as well as primary care providers.

Figure 52: Cancer prevalence projections, 2000-2020



Source: NCI Prevalence Projections, July 2006

Visit-rates to Oncologists

Projecting demand for oncologist services is not just a factor of the number of patients with cancer, but also requires the probability of seeing an oncologist over the course of the disease and number of visits each patient seeing an oncologist makes to an oncologist. These rates vary by type of cancer, patient age and gender, and time from diagnosis. The model used here only projects demand by patient age, gender, and time from diagnosis and not by individual cancer type. This reflects the data limitations and the great uncertainty of interventions and practice patterns at the individual cancer level.

Analysis of the NCI visit-rate data reveals that fewer than half (46.6%) of all cancer patients see an oncologist during the first 12 months post diagnosis (see Table 16). The probability of seeing an oncologist decreases to 36.4% for patients in the continuing stage between the initial-year post diagnosis and the last year of life and is slightly lower (34.9%) for patients in the last 12 months of life. However, those who do see an oncologist in the last year of life generally have the highest mean number of visits to an oncologist. Patients in the continuing stage have the lowest mean number of visits per year.

Table 16: Probability of seeing an oncologist and mean number of visits to oncologists by age and time from diagnosis

		Initial 12 Months Post Diagnosis		Continuing Stage (between Initial Year and Last Year of Life)		Last 12 Months of Life	
		Percent with at least one visit to oncologist	Mean number of visits to oncologist	Percent with at least one visit to oncologist	Annualized mean number of visits	Percent with at least one visit to oncologist	Mean number of visits to oncologist
Male	65-69	31.0	16.9	25.5	8.1	41.9	20.9
	70-84	31.4	15.4	27.3	8.0	37.7	16.7
	85+	27.8	10.3	19.4	6.2	19.1	8.0
Female	65-69	70.8	15.5	55.8	6.6	45.3	23.9
	70-84	66.4	13.0	47.9	6.8	35.7	16.6
	85+	47.6	8.0	26.9	5.0	16.6	9.0
Total	All	46.6	14.0	36.4	7.1	34.9	17.3

Source: National Cancer Institute, July 2006 – based on analysis of 1998-2002 SEER data

While on average, fewer than half of all patients in the initial year post diagnosis see an oncologist, analysis by type of cancer and stage shows that prostate cancer drives down the

mean. Relatively few prostate cancer cases are seen by an oncologist (see Table 17), and prostate cancer is the most common form of cancer in males. Stage of cancer plays a similar role in determining the probability of seeing an oncologist when the treatment at that stage is less likely to involve chemotherapy. Since the cancer incidence and prevalence projections are not cancer type- or stage-specific, the visit-rate calculations were calculated on age and gender variation only.

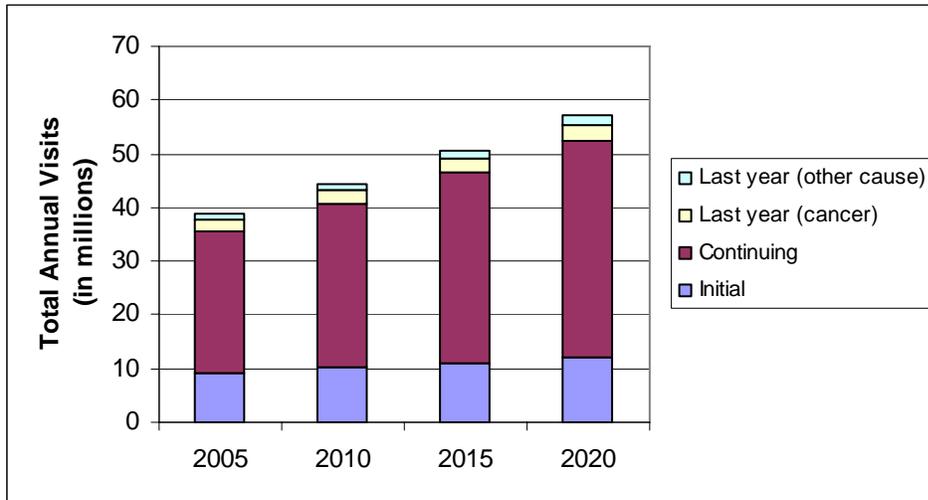
Table 17: Probability of seeing an oncologist in the first 12 months post diagnosis, by cancer type and stage

	Percent With at Least One Oncology Visit within First 12 Months Post Diagnosis			
	Prostate	Breast	Colorectal	Lung
N=	18,258	11,698	9,528	5,002
In Situ	0%	56%	12%	57%
Stage I	12%	76%	35%	48%
Stage II	12%	83%	62%	70%
Stage III	14%	85%	83%	76%
Stage IV	31%	92%	80%	79%
Unstaged	11%	64%	41%	51%

Source: National Cancer Institute, May 2006 – based on analysis of 1998-2002 SEER data

Since the NCI used only SEER-Medicare data, persons under age 65 were not included in their visit-rate calculations. Therefore, the youngest age group in the NCI visit analysis (65-69 years) was used as the visit-rate for all cancer cases under age 70. As was the case on the supply side, for each group, two distinct visit-rates were calculated – one with all values included and one with extreme values excluded (in this case, cases with more than 100 annual visits were excluded). With these assumptions, visits to oncologists for cancer are forecast to increase from 38.8 - 41.2 million to 57.3 - 60.7 million between 2005 and 2020. As Figure 53 illustrates, most visits are for patients in the continuing stage between first-year post diagnosis and the last year of life.

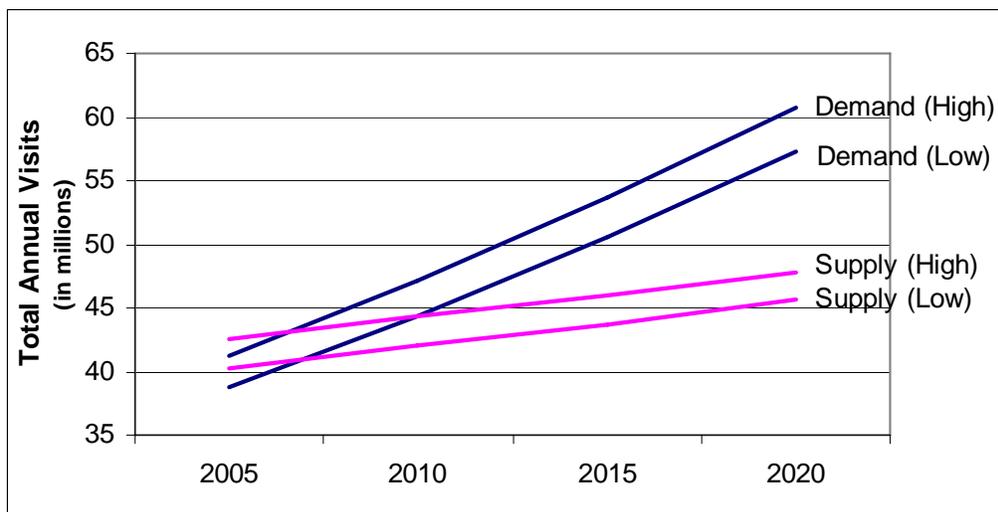
Figure 53: Distribution of low estimate of total annual visits by time from diagnosis, 2005-2020



Comparing Baseline Supply and Demand Trends

As is evident in these baseline projections, the supply of oncologists will move from a relatively comfortable state of balance with demand for oncologists in 2005 to a state of acute shortage in 2020, with visit demand growing at a much quicker pace than the available supply. Under the best-case scenario of high supply and low demand, there will be a shortage of 9.4 million visits, and in the worst-case scenario of high demand and low supply, the shortage could be as great as 15.1 million visits (see Figure 54). This translates to a shortage of 2,550 to 4,080 oncologists – roughly 25% to 40% of the 2005 supply. Under either scenario, there will not be enough oncologists to provide the services demanded by a growing cancer patient population.

Figure 54: Baseline supply and demand projections, 2005-2020



Chapter 4: Alternate Supply Scenarios

The baseline supply and demand models presented in Chapter 3 assume that practice and utilization patterns will remain the same in 2020 as they are today. This chapter explores a series of scenarios and demonstrates how visit capacity might change based on different supply assumptions.

It is hard to predict the future and, therefore, the scenarios presented focus primarily on actionable and plausible assumptions developed under the guidance of the ASCO Workforce in Oncology Task Force and are based largely on results of the 2006 Survey of Clinical Oncologists. Oncologists were asked to indicate if any of the listed solutions had potential for addressing future workforce shortages without compromising the quality of care provided. The options are grouped into three main themes: 1) increased efficiency, 2) increasing/extending the oncology workforce, and 3) increasing the use of related care providers, such as hospice and palliative care providers (see Table 18).

Table 18: Oncologists' rating of potential options for addressing future shortages

Theme	Scenario	% Significant Potential
Increase Efficiency	Reduction of paperwork and regulations	61%
	Improved IT such as electronic medical records	43%
Increase / extend oncology workforce	Increased use of NPs/PAs	36%
	Train more oncologists	34%
	Increased use of oncology nurses and CNS	32%
	Create incentives to delay retirement	28%
Increase use of related care providers	Hospice and palliative care providers	26%
	Social workers, counselors, and patient educators	24%
	Hospitalists	20%
	Pain and symptom management specialists	17%
	Primary care providers to care for patients in remission	15%

Source: 2006 Survey of Clinical Oncologists

The two most highly rated supply scenarios revolved around the theme of improved efficiency. Nearly two out of three (61%) respondents rated reduction of paperwork and regulations as having significant potential for addressing shortages. The next highest-rated option was improved efficiency through information technology such as electronic medical records (EMRs), with 43% of respondents rating the option as having significant potential.

Increasing/extending the workforce was the next highest-rated theme, with one out of three saying increased use of NPs/PAs and training more oncologists would have significant potential for addressing future shortages. Oncologists were least likely to rate increased use of primary care providers to care for patients in remission as a potential remedy (this scenario will be explored in Chapter 5 as an alternate demand scenario.)

Several of the scenarios include minimum and maximum options, ultimately yielding a total of 9 different supply forecasts – labeled on Figure 55 and Table 19 as A through I, with A having the greatest impact and I actually showing a decrease in visit capacity below baseline projections.

Figure 55: Alternate supply scenario projections, 2005-2020

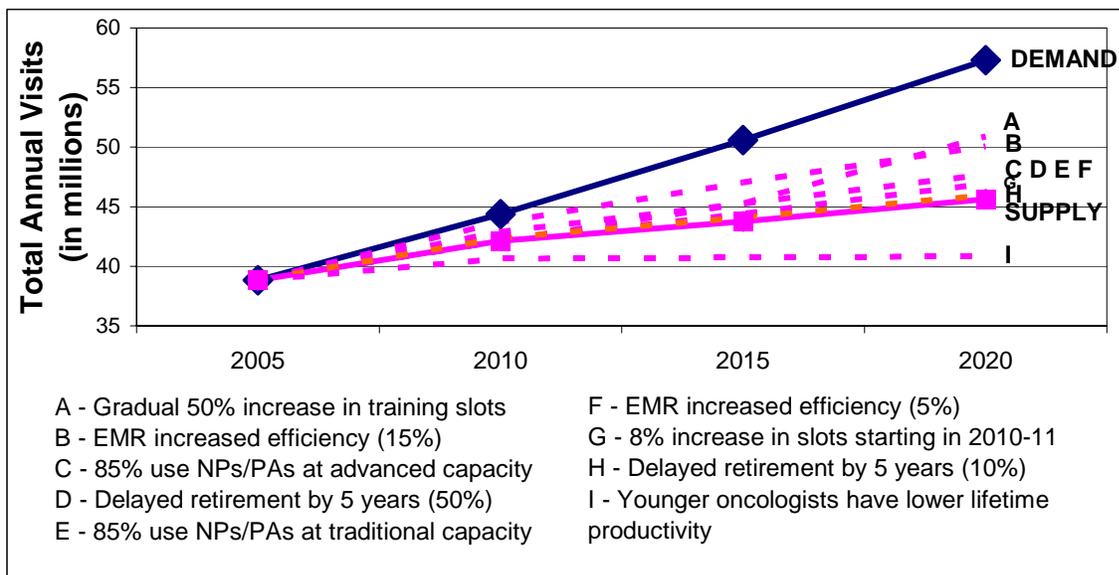


Table 19: Description of alternate supply scenario assumptions

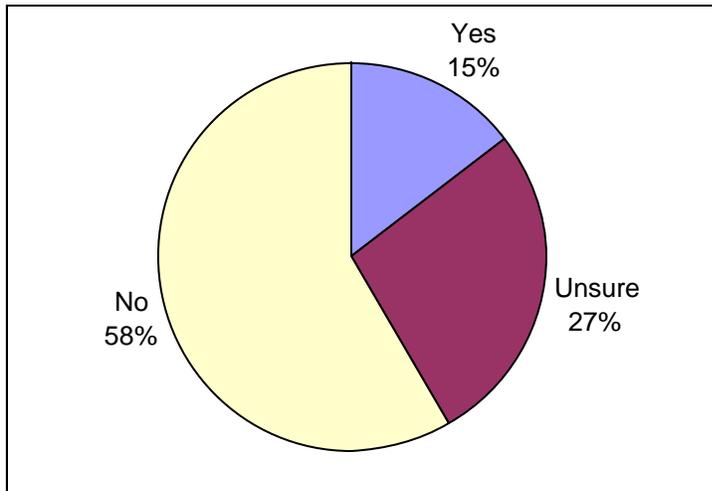
Scenario	Assumptions	Potential Yield in 2020 Compared to the Baseline Supply
Increase in the number of fellowship slots	Scenario A: <ul style="list-style-type: none"> ▪ 50% increase in new slots Scenario G: <ul style="list-style-type: none"> ▪ 8% increase in new slots 	1.3 million – 5.2 million visits
Increased use of electronic medical records (5% per year adopt EMRs)	Scenario B: <ul style="list-style-type: none"> ▪ 15% increase in visit capacity Scenario E: <ul style="list-style-type: none"> ▪ 5% increase in visit capacity 	1.5 million – 4.5 million visits
Increased usage of NPs/PAs	Scenario C: <ul style="list-style-type: none"> ▪ 85% work with NPs/PAs in advanced capacity Scenario F: <ul style="list-style-type: none"> ▪ 85% work with NPs/PAs in traditional capacity 	1.9 million to 2.1 million visits
Delayed retirements	Scenario D: <ul style="list-style-type: none"> ▪ 50% delay retirement by 5 years Scenario H: <ul style="list-style-type: none"> ▪ 10% delay retirement by 5 years 	.4 million – 2.1 million visits
Younger oncologists have lower lifetime productivity	Scenario I: <ul style="list-style-type: none"> ▪ Visit capacity not increased as physicians age into 45-64 age cohort 	- 4.8 million visits

Increase in the Number of Oncology Fellowship Training Positions

When facing the prospect of physician shortages, the first solution that comes to mind is to train more. However, this seemingly obvious answer is not easy to accomplish. Although the number of fellows entering oncology fellowships has increased 27% over the past decade, there are few signs that this growth trend is continuing at the same rate.

In the 2005 survey of oncology fellowship program directors, only 15% of respondents indicated they have ‘definite’ or ‘probable’ plans to increase training slots by the 2010-11 academic year (see Figure 56). However, this would not translate to a 15% increase in the number of training slots, as the mean number of potential new slots was only 1.5 per program. If 15% of all medical oncology and hematology/oncology programs increased by 1.5 new slots, it would only yield an 8% increase in the number of fellowship opportunities – the level modeled in Scenario G.

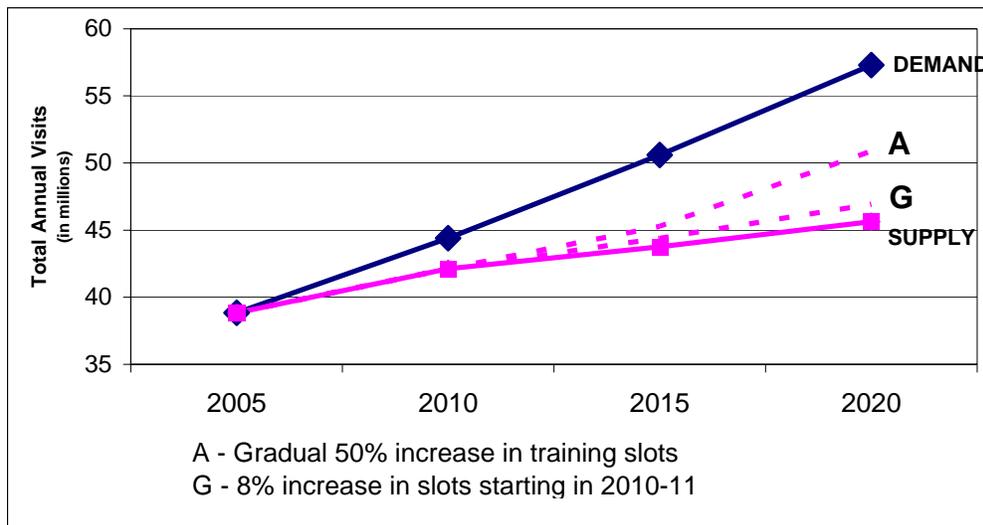
Figure 56: Plans for increasing enrollment between 2005 and 2010-11 academic year



Source: 2005 Survey of Oncology Fellowship Program Directors

Scenario A, with a 50% increase in new training slots by 2010, would go a long way toward addressing future projected shortages (see Figure 57). However, it would be very challenging to implement a 50% increase in such a short time frame given current known expansion plans and program directors' concerns about fellowship funding and the quality of the applicant pool to support that level of growth. It is mainly included for illustrative purposes and is not presented as a likely scenario. There is also the constraint of being dependent on the number of internal medicine and obstetric/gynecologic residents completing training, which has been flat for the past 10 years.

Figure 57: Potential yield from an increase in fellowship slots



Scenario G, with an 8% increase in slots by 2010, is likely a conservative estimate of future expansion if program directors who said they were ‘unsure’ or even some of those with no plans to offer more slots decide to aggressively pursue increasing the number of training slots after seeing evidence (such as this report) that points to a significant future shortage of oncologists.

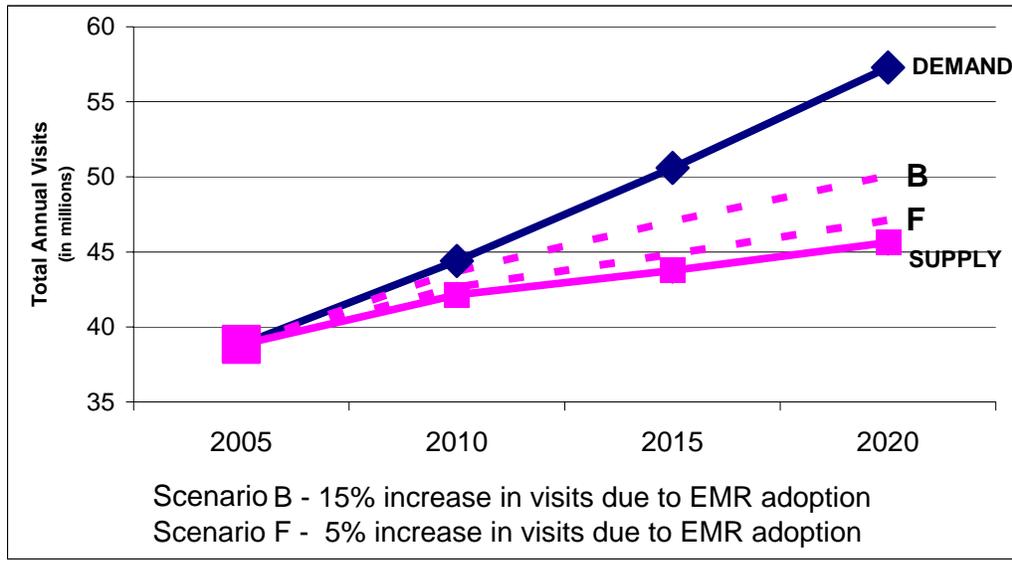
Increased Efficiency

On the Survey of Clinical Oncologists, respondents rated improved efficiency through reduction in paperwork or increased adoption of electronic medical records (EMRs) as having significant potential to address future shortages. While there is no published evidence that use of EMRs increases physician productivity⁵¹, this scenario can serve as a proxy for any form of productivity gains including reduced paperwork, a scenario that would be conceptually difficult to model.

Since literature shows that 25% of practitioners use some form of electronic medical records,⁵² this was used as the starting base incorporating a gradual increase in adoption of EMRs (5% per year up to 90% penetration). Two different hypothetical associated productivity gains were applied to show the potential range of impact – 5% productivity increase (Scenario F) and 15% productivity increase (Scenario B).

Figure 58 shows that, assuming there is a link between use of EMRs and higher physician productivity, a gradual adoption of EMRs between now and 2020 could yield an increase of 1.5 to 4.5 million annual visits. However, it is unclear whether efficiency gains are likely to occur or what the likely percentage increase would be. It is also not possible to know if improved efficiency would lead to an increase in visits per oncologist or whether oncologists would use the improvements to spend more time with patients and/or work fewer hours.

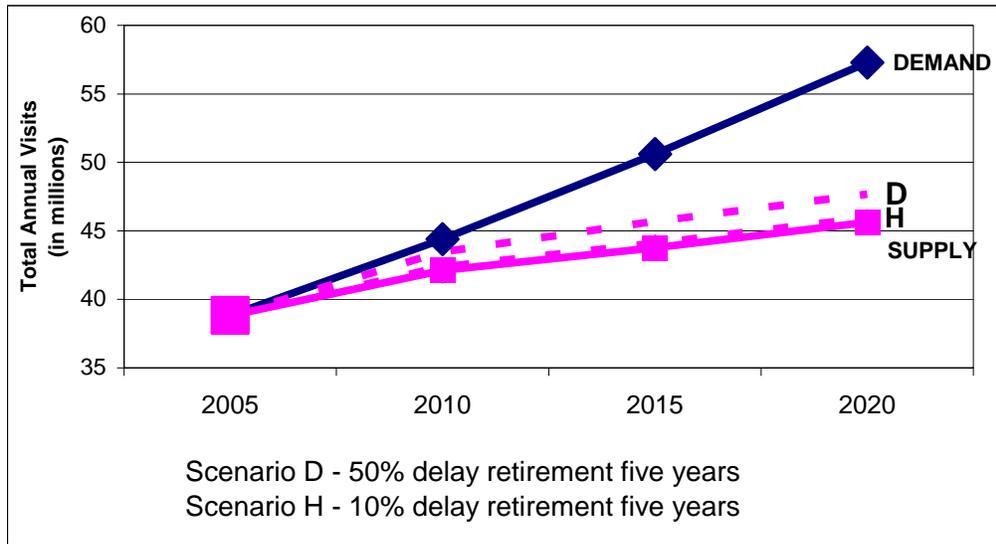
Figure 58: Potential yield from increased efficiency



Delayed Retirement

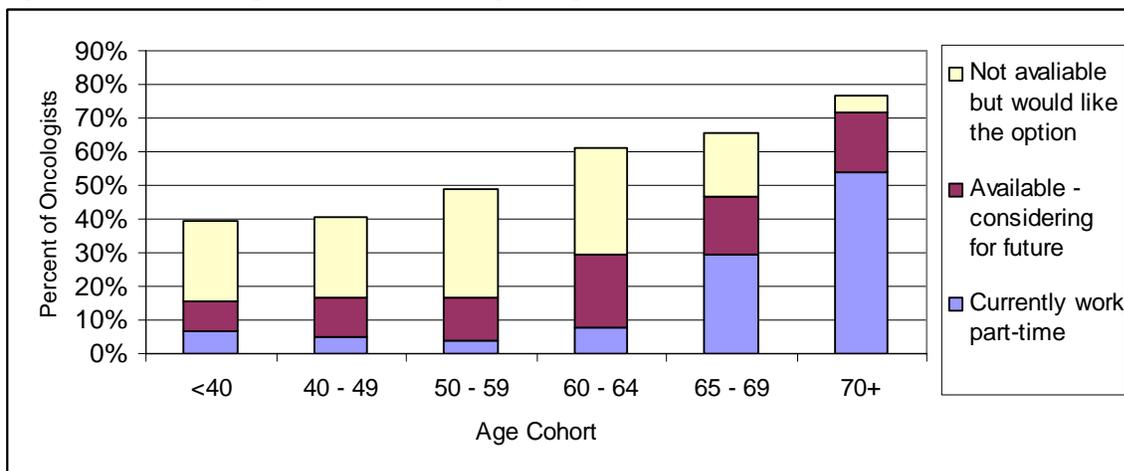
Over half of currently practicing oncologists are over 50, and most are likely to retire by 2020.⁵³ This scenario explores how visit capacity will change if a subset of oncologists delays retirement by five years. On the Survey of Clinical Oncologists, one out of four respondents indicated that creating incentives to delay retirement could have significant potential for addressing future shortages. Two different scenarios were modeled: 10% of practicing physicians delay retirement by five years (Scenario H) and 50% delay retirement by five years (Scenario D). Annual visit capacity was not adjusted although a likely incentive for remaining in practice would be the option to work part time or to have reduced on-call responsibilities, which could mean that the resulting scenarios overestimate the potential productivity gains that would result. Figure 59 shows that Scenario H (10% delay retirement) has an extremely modest effect on overall visit capacity, whereas Scenario D (50% delay retirement) is comparable to several of the other scenarios presented.

Figure 59: Potential yield from delays in retirement



However, it is unclear how likely physicians are to delay retirement or how willing employers would be to offer incentives such as part-time hours in order to retain their workforce. The majority of active physicians in their seventies do work part time and many oncologists want to work part time but do not have the option in their current work setting (see Figure 60). Nearly one-third (32%) of physicians in both the 50-59 and 60-64 age cohorts were interested in part-time hours but the option is not available in their practice setting. However, it is unknown based on this data whether the option to work part time would lead them to delay retirement or merely reduce hours sooner.

Figure 60: Interest in part-time hours, by age category

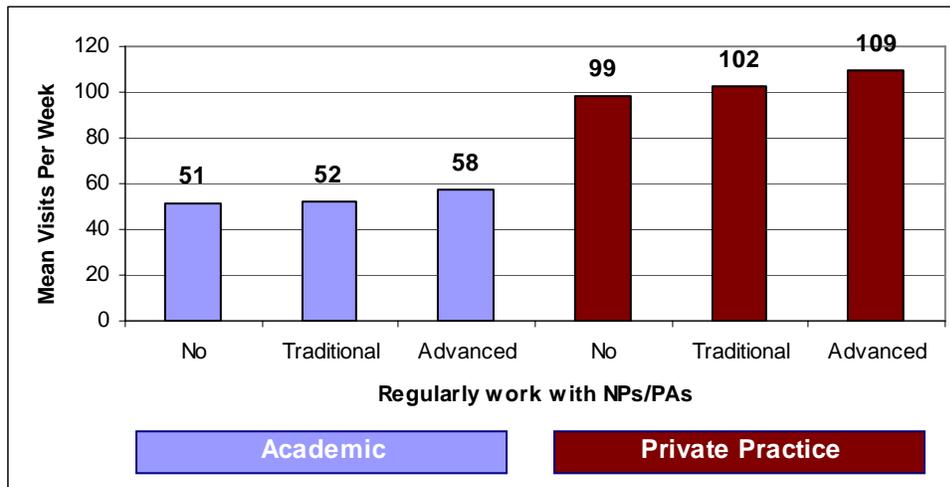


Source: 2006 Survey of Practicing Physicians

Increased Use of NPs/PAs

According to the 2006 Survey of Clinical Oncologists, over half (56%) of practicing oncologists currently work with nurse practitioners and/or physician assistants. Analysis of the visit-rate data reveals that, on average, physicians who work with nurse practitioners have a higher number of patient visits per week than those who do not. The weekly visit-rate is highest for private practice physicians who work with NPs/PAs who regularly perform *advanced patient care activities* such as assisting with new patient consults, ordering routine chemotherapy, or performing invasive procedures. Conversely, the visit-rate is lowest for academics who do not work with NPs/PAs (see Figure 61).

Figure 61: Variation in visit-rates by setting and use of NPs/PAs



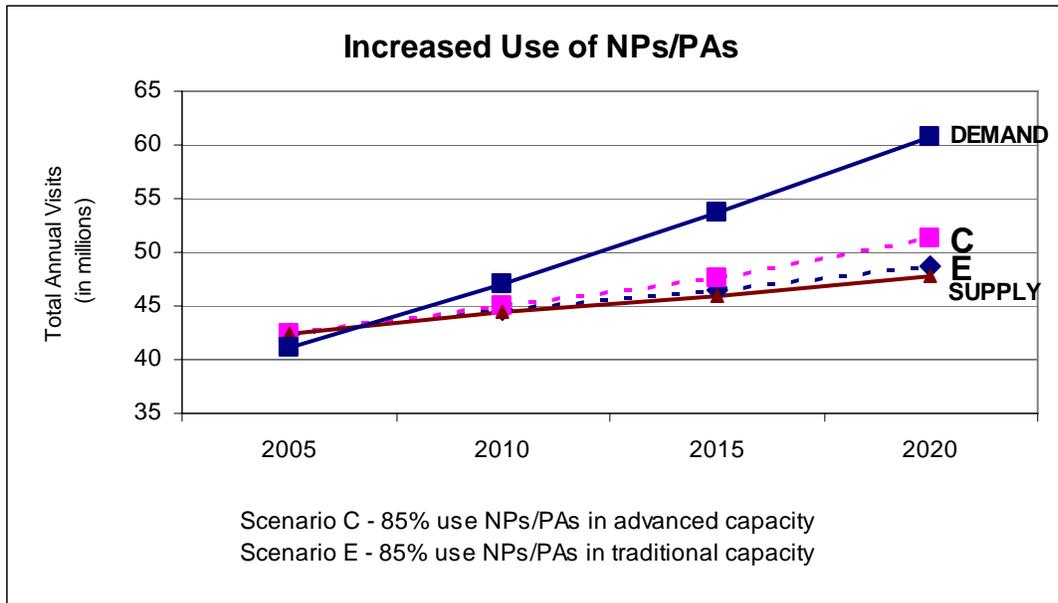
Source: 2006 Survey of Practicing Physicians

It is important to note that the increased visit-rate associated with working with NPs/PAs is not uniform across all setting, age, and gender cohorts. For example, there is no evidence that visit-rates are higher for academics who work with NPs/PAs who only regularly perform traditional activities such as patient education. Therefore, the scenario did not include any increase in visit capacity for this group.

While the increase is not uniform across all cohorts, clear trends can be modeled to show how total annual visit-rates might increase if more physicians begin to work with NPs/PAs. Figure 62 shows the potential increase in visit capacity that might be achieved if 85% of private practice

oncologists use NPs/PAs in a traditional role (Scenario E) and if 85% of academic and private practice oncologists use NPs/PAs in advanced capacity (Scenario C).

Figure 62: Potential yield from increased use of NPs/PAs



Other likely benefits could stem from increased usage of NPs/PAs in oncology care. Results of the 2006 Survey of Clinical Oncologists clearly demonstrate that oncologists who work with NPs/PAs believe that use of NPs/PAs not only improves efficiency, but also leads to improved patient care and higher professional satisfaction (see Chapter 2).

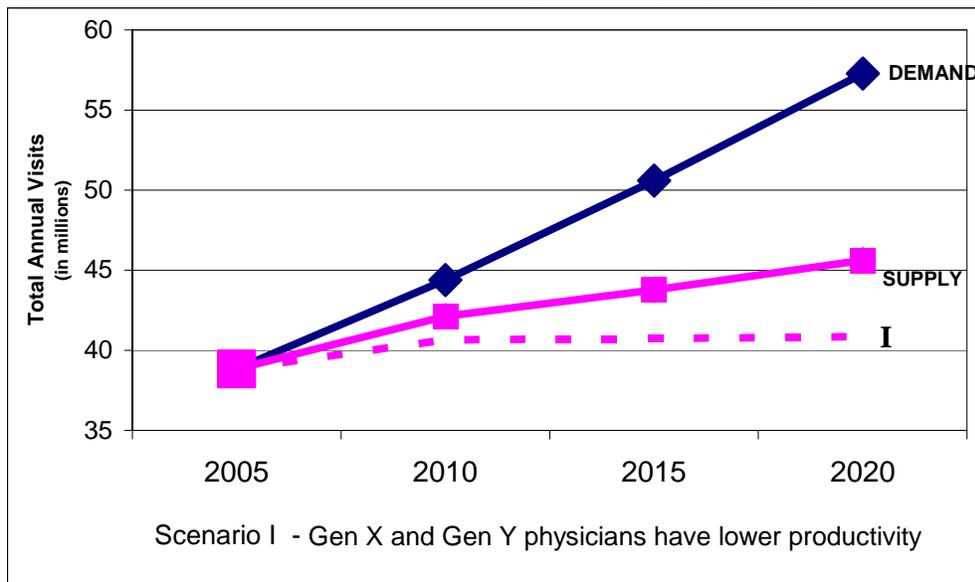
Scenario C is a somewhat optimistic scenario given that only 25% currently use NPs/PAs in advanced capacities. There also could be limits on the possibility of achieving Scenario E beyond physician resistance to the concept or concerns about being able to afford having an NP/PA in the practice. It is not entirely clear whether enough NPs or PAs will be available even if there is such an increase in demand for their services. Primary care and other specialties are facing physician shortages and will compete with oncologists and other specialists for nurse practitioners and physician assistants. Secondly, while the numbers of NPs has increased by over 50% since 1999, it is unclear whether they will be able to sustain this level of growth. For example, nursing schools are having a difficult time recruiting faculty, which could slow the

growth in the number of nurse practitioners.⁵⁴ The American Academy of Physician Assistants however, projects the PA workforce will grow another 49% between 2005 and 2014.⁵⁵

Younger Generations Have Lower Lifetime Productivity

Results of the Survey of Clinical Oncologists show that physicians under 45 have fewer visits per week on average compared to those aged 45-64 (see Chapter 2). However, it is unknown whether this is an age-specific variation and if these physicians will have increased visit capacity when they age into the 45-64 cohorts (which is how productivity is modeled for the baseline supply) or if it is a generational difference and therefore, these physicians are unlikely to increase productivity as they age into the 45-64 bracket. In order to model a generational difference in lifetime visit capacity, under Scenario I annual visit-rates were not increased as physicians aged into the “prime” productivity cohort. Therefore, Scenario I projects a significantly lower total visit capacity in 2020 compared to the baseline supply forecast (see Figure 63).

Figure 63: Potential decrease of lower lifetime productivity of younger generations of oncologists



Results from a Canadian study of primary care physicians show a similar bump in visit-rates for physicians in the 45-64 age cohort. More importantly, when comparing age-specific visit-rates from 1992 and 2001, there was no evidence that visit capacity for a particular generation of physicians changed as they aged. For example, productivity data from 1992 showed that

physicians in the 35-44 age cohort saw approximately 4,000 visits per year. In 2001, physicians in the 45-54 cohort (who would have been in the 35-44 cohort in 1992) saw approximately 4,000 visits as well – though in 1992, physicians in this age cohort saw over 4,500 visits.⁵⁶ Therefore, it is quite possible that the results presented in Scenario I could be a more accurate reflection of future visit capacity than the baseline supply projections.

Summary

All of the supply scenarios (with the exception of Scenario I) show potential to increase visit capacity between now and 2020, though none of the scenarios alone can fully eliminate the gap between projected supply and demand. Additionally, many scenarios are extremely ambitious in scope and difficult to fully achieve by 2020. However, the data does point to several possible action steps that ASCO and other policymakers could pursue to increase visit capacity and hopefully minimize, if not eliminate, future shortages.

Chapter 5: Alternate Demand Scenarios

The baseline supply and demand models presented in Chapter 3 assume that practice and utilization patterns will remain the same in 2020 as in the base year. This chapter explores how demand for oncologists (as measured in total annual visits) might increase or decrease under various scenarios related to the use of other specialists and changes in visit-rates.

It is hard to predict the future and, therefore, the scenarios presented focus primarily on plausible demand scenarios that were developed under the guidance of the ASCO Workforce in Oncology Task Force. Several of the scenarios include minimum and maximum options, ultimately yielding a total of seven different demand forecasts – labeled on Figure 64 and Table 20 as A through F, with A having the highest demand and F the lowest. Under these various scenarios, demand can range from a high of 68 million visits to a low of 48 million visits.

Figure 64: Alternate demand scenario projections, 2005-2020

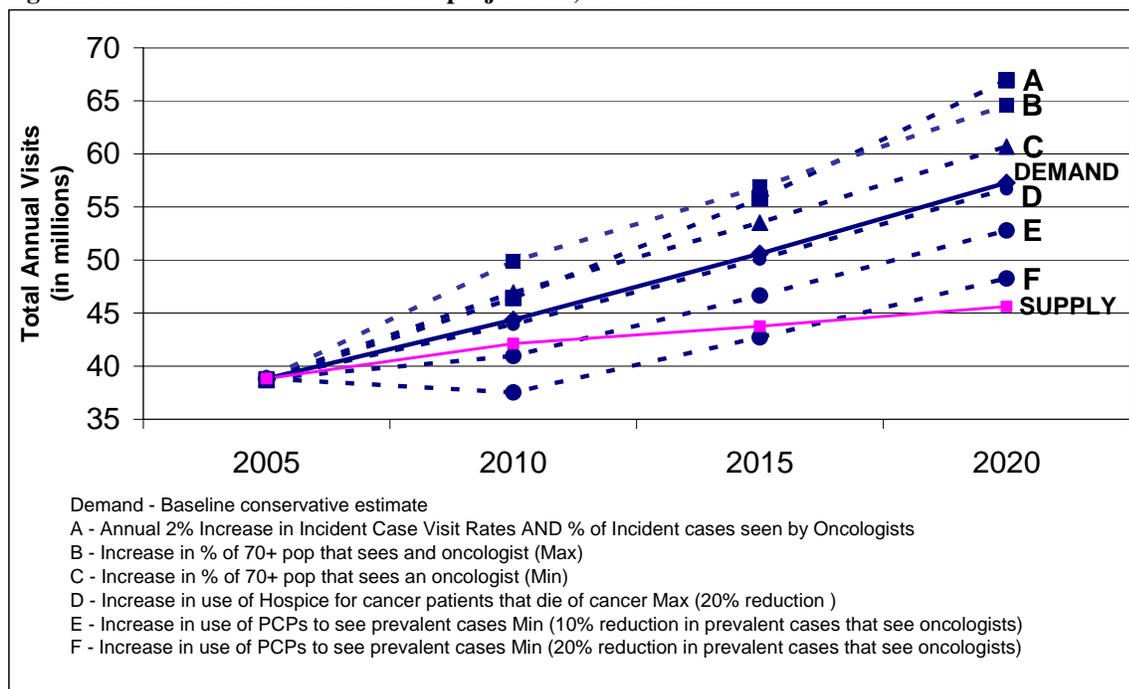


Table 20: Demand scenarios

Scenario	Assumptions	Potential Impact in 2020 Compared to the Baseline Demand
Increase in visits	Scenario A: <ul style="list-style-type: none"> ▪ 2% annual increase in percent of patients who see an oncologist and in mean visit-rates for patients in the first 12 months post diagnosis 	+ 9.7 million visits
Increase in the percent of the 70+ population that sees an oncologist	Scenario B: <ul style="list-style-type: none"> ▪ Visit-rates for 65-69 population applied to 70+ population Scenario C: <ul style="list-style-type: none"> ▪ Mid-range between the 70+ visit-rates and the 65-69 visit-rates applied to the 70+ population 	+ 3.4 million to 7.3 million visits
Increased use of hospice to treat end-of-life patients	Scenario D: <ul style="list-style-type: none"> ▪ 20% reduction in the proportion of patients in the last year of life who see an oncologist 	-.6 million visits
Increased use of primary care providers to treat patients in remission	Scenario E: <ul style="list-style-type: none"> ▪ 20% reduction in proportion of continuing cases who see an oncologist Scenario F: <ul style="list-style-type: none"> ▪ 10% reduction in proportion of continuing cases who see an oncologist 	-4.5 million to 9.0 million visits

Increase in Visits

The baseline forecast assumes that the percent of patients who see an oncologist and the mean visit-rates will not change in the future and applies a three-year average (2000-2002) of visit-rates from SEER to the U.S. Census population projections through 2020. However, analysis of the NCI visit data reveals that the percentage of patients who saw an oncologist during the first 12 months post diagnosis increased by 12% between 1998 and 2002, and the mean visit-rates for

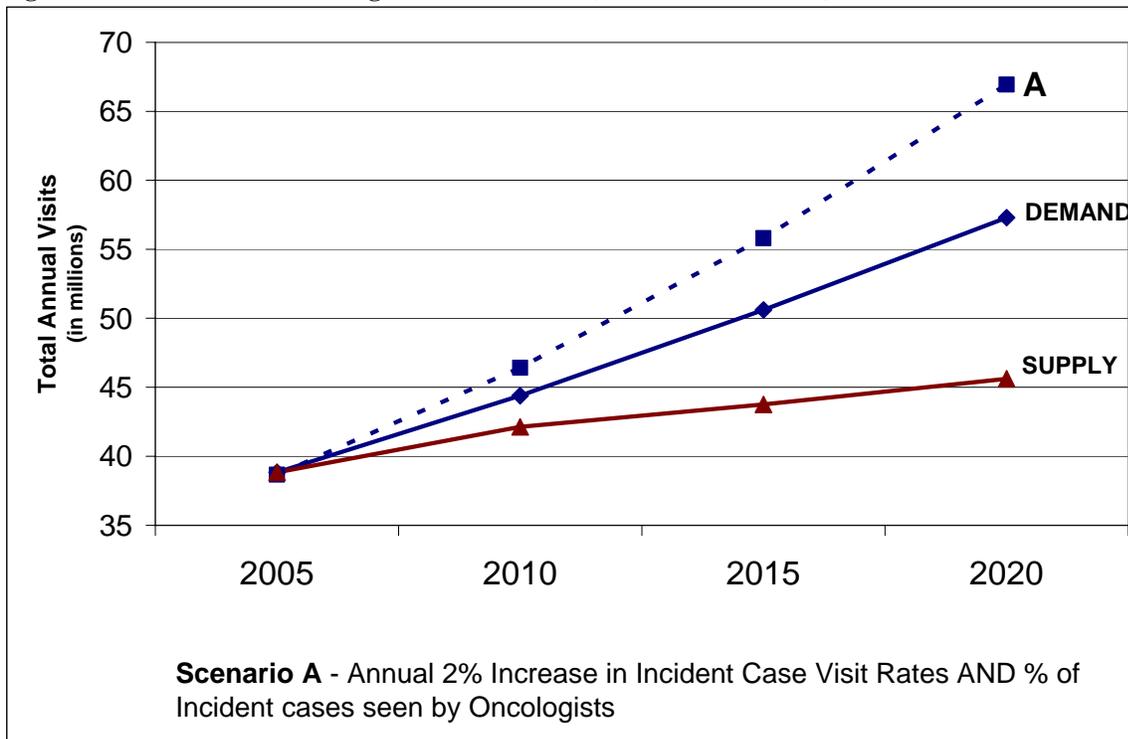
those patients increased by 25%.ⁱⁱⁱ This increase may reflect the increasing treatment options and complexity of cancer treatment protocols.

Scenario A illustrates how visit-rates would increase if patients in the first 12 months post diagnosis were more likely to see an oncologist and if they had higher visit-rates. To apply the rate of change exhibited in that 4-year period across a 15-year timeframe seems like an implausible rate of growth to sustain over 15 years. Therefore, a more conservative approach of a 2% annual increase in the percentage of patients who see an oncologist and a 2% annual increase in the mean visit-rates for patients in the first 12 months post diagnosis was modeled for this scenario.

The scenario does not include any change in visit-rates for patients more than 12 months post diagnosis. Nonetheless, of all of the demand scenarios, this yielded the largest increase in total annual visits in 2020 of any of the scenarios (see Table 23). To put this in further context, Figure 65 shows that if Scenario A is realized, the gap between supply and demand would nearly double.

ⁱⁱⁱ Between 1998 and 2002, the SEER registry expanded to include all of California, Kentucky, New Jersey, and Louisiana. The growth in visit-rates between 1998 and 2002 remained even when the expansion sites were excluded from the 2002 analysis.

Figure 65: Increase in the average number of visits (Demand Scenario A)



Given the recent development of adjuvant therapies and the potential for new adjuvant therapies to be introduced, mean visit-rates may continue to increase – although at what pace is unclear.

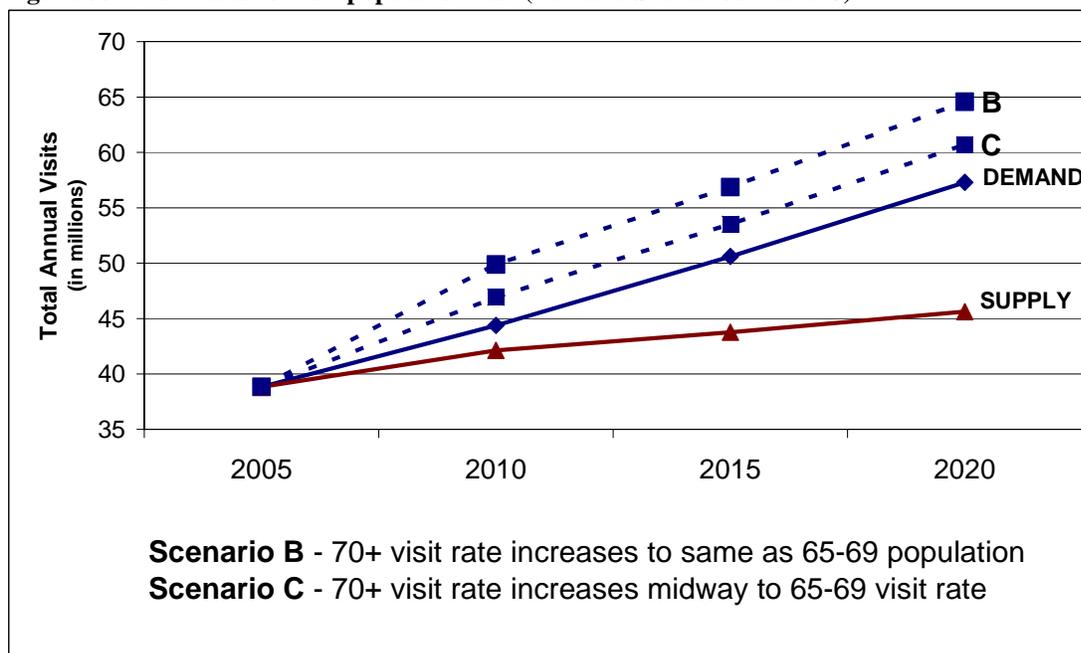
This scenario is a conservative approach to estimating future demand as it only factors in potential increases for those in the initial year post diagnosis. An Institute of Medicine (IOM) report on care for cancer survivorship points out that survivors generally receive follow-up care focusing on surveillance for recurrence and treatment of subsequent cancers, but other key elements of care are not provided, such as intervention for consequences of cancer and its treatment and coordination of care between specialists and primary care providers.⁵⁷ The IOM estimates that if National Comprehensive Cancer Network (NCCN) breast cancer guidelines are followed, a breast cancer survivor would make 10 to 15 visits over the course of 5 years. While these visits would not necessarily be to oncologists, this would represent a significant increase in demand for oncology follow-up services – regardless of who provides the care. Oncologist visit-rates for the large, growing population of cancer survivors could potentially increase significantly if recommended care guidelines discussed above are followed for all patients.

Increase in demand for oncologist services by 70+ population

Analysis of the NCI visit data shows that patients aged 70 or older are less likely to see an oncologist and, with the exception of those aged 70-84 in the continuing phase, have fewer visits to oncologists than those in the 65-69 cohort (see Chapter 3, Table 16). However, it is quite possible that when baby-boomers age into their seventies they will be more likely to pursue active cancer treatment and have visit-rates similar to younger patients.

In order to model how demand for oncologist services would change if patients over 70 had similar visit-rates as patients under 70, two scenarios were developed. Figure 66 shows that visit-rates could increase beyond baseline projections by 3.4 to 7.3 million annual visits in 2020 if patients aged 70 and older do approach the visit-rates of younger populations. Scenario B illustrates how demand would increase if patients aged 70 and older have the exact same visit-rates as patients aged 65-69. Scenario C is a more conservative estimate of what visit-rates would look like if patients 70 and older reached the midpoint between the two age-specific rates.

Figure 66: Visit-rates for 70+ population rise (Demand Scenarios B and C)



This is a fairly plausible scenario because visit-rates for the baby boomer generation are already higher than for previous generations. The CDC's National Ambulatory Medical Care Survey shows that visit-rates for patients aged 50-64 grew by 26% between 1994 and 2001, although

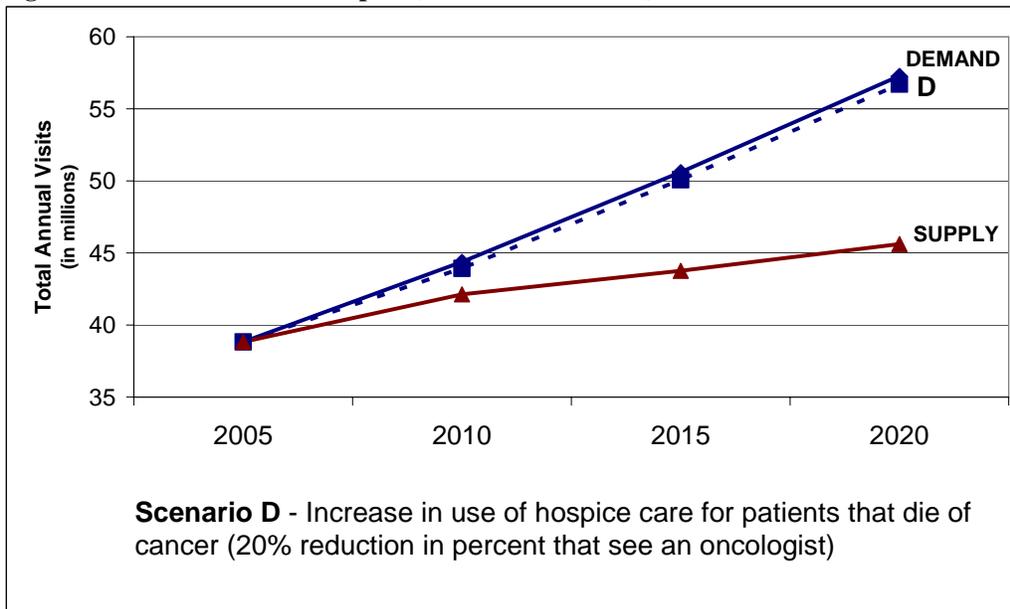
they have remained stable since then.⁵⁸ An April 2006 article in the *New York Times* provides further indication that baby boomers are likely to remain active and interested in finding solutions to health care setbacks.⁵⁹ While the article focuses on knee and hip replacement procedures and how boomers are frequently receiving orthopedic surgeries formerly rare in patients over 50, it is not a far stretch to think they might be more aggressive about treating cancer when they are also in their seventies.

Increased Use of Hospice Providers to Treat End-of-life Patients

While there is compelling evidence that baby boomers will be interested in pursuing aggressive treatment (see above), a growing number of people are choosing hospice at end-of-life. A recent Health Affairs article shows that hospice care grew dramatically in the 1990s with 25% of Americans under hospice care at the time of death in 2000.⁶⁰

This scenario shows how demand for oncologists would decrease if a 20% increase occurs in the number of patients in the last 12 months of life who choose hospice. This scenario is modeled by decreasing the percentage of patients who see an oncologist in the last 12 months and yields a fairly marginal impact on demand, reducing the projected total annual visits in 2020 by only a little over half a million visits (see Figure 67) – a relative drop in the bucket compared to overall demand, as patient visits in the last year of life are a relatively small percentage of overall oncologist visits.

Figure 67: Increased use of hospice (Demand Scenario D)



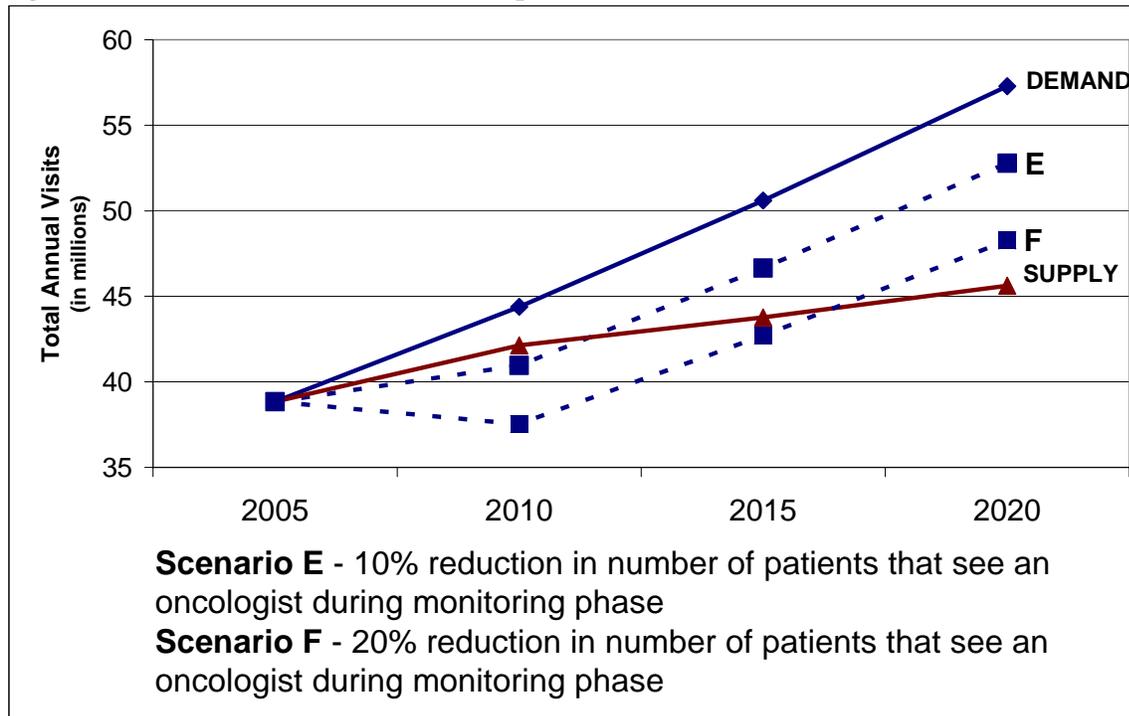
This scenario could be plausible; however, it is important to note that it likely overestimates the reduction in demand for oncologist visits since under current hospice utilization patterns most patients only seek hospice in the last few weeks of life. While the number of cancer patients using hospice increased from approximately 180,000 cancer patients in 1991-1992 to nearly 400,000 in 1999-2000, only 37% of hospice patients have stays of more than 30 days and nearly half have stays of less than 15 days.⁶⁰ Patients are likely to pursue curative treatment initially and only switch to palliative care at the very end-of-life.

Increased Use of Primary Care Providers for Patients not in Active Treatment

On the Survey of Clinical Oncologists, respondents reported that one out of three visits is for a patient two or more years in remission. This clearly could present a significant opportunity for addressing shortages if there is a way to reduce oncologist visits for this large and growing population. This scenario models the impact of having primary care providers (PCPs) play a larger role in managing patients who are not in active treatment.

Figure 68 shows that increased use of PCPs has the potential to decrease demand for visits by 4.5 to 9.0 million visits in 2020. This scenario was explored by decreasing the percentage of patients in the continuing stage who see an oncologist by 10% (Scenario E) and by 20% (Scenario F).

Figure 68: Increased use of PCPs to care for patients in remission (Demand Scenarios E and F)



However, when asked to rate the potential of increased use of primary care physicians to care for patients not in active treatment, only 12% of oncologists rated this as having significant potential to address shortages. Their skepticism could stem from the increasing discussion of future shortages of primary care physicians and by reports that PCPs are already stretched thin. (PC references).

Summary

Supply is not likely to meet demand in 2020 even under the most optimistic demand scenario, and several scenarios point to even more dire shortages than the baseline model forecasts. It is quite possible that demand could exceed the baseline projection if baby boomers have higher visit-rates than previous generations or if visit-rates continue to increase due to changing

treatment protocols. However, it is also possible that demand for oncologist visits could be significantly lower than the baseline projection due to increased use of PCPs, although this would be a challenging scenario to realize. The data does point to several possible action steps that ASCO and other policymakers could pursue that might decrease demand for oncologist visits and hopefully minimize, if not eliminate, future shortages. It will be important to continue monitoring visit data to determine how quickly demand for oncologists is changing and which of the scenarios seem to be occurring.

Chapter 6: Monitoring of Supply and Demand for Oncologist Services – Suggested Data Collection and Analysis

Given that many factors could change the balance between supply and demand over the coming years, it will be essential for ASCO to continually monitor the supply of oncologists and the demand for oncologist services. The following data elements can provide a basic data set that can be supplemented by additional data collection and research.

ASCO should consider tracking several key supply and demand indicators on an annual basis, including:

- The number of oncology fellowship programs and the number of oncology fellows entering and completing training;
- Basic demographic data on the oncologist workforce (age, gender, specialty, practice zip code and practice setting);
- Data on oncologists' current work hours, wait time to schedule an appointment, and plans for retirement;
- Cancer incidence and prevalence figures; and
- Oncologist visit-rate data.

Much of the data is available in annual publications but some would require ASCO to undertake new data collection efforts. Table 21 provides an outline of which data elements are regularly published and includes recommendations on how ASCO might expand its current data collection activities to enhance understanding of the oncologist supply. These data elements will need to be trended over time and regularly shared with ASCO leaders and other policymakers.

By investing resources into monitoring supply and demand indicators, ASCO will be able to answer key questions about the future of the specialty, such as:

- Has the number of oncology fellowship slots increased, and if so, at what pace?

- Is the specialty remaining competitive compared to other subspecialties in its ability to attract internal medicine, obstetric/gynecologic, and pediatric residents and in its ability to attract U.S. medical graduates?
- How is the current supply of oncologists changing? Have any changes occurred in the number of oncologists practicing in academic settings? Are more oncologists working part time?
- How many oncologists plan to retire in the next year?
- Are the number of incident and prevalent cancer cases continuing to rise as projected?
- Are wait times for new appointments increasing or decreasing?

Monitoring the Supply of Oncologists

The supply projections presented in this report incorporated data and trends on the new entrants into the oncologist workforce, the current supply of practicing oncologists, and the retirement patterns of those leaving the workforce. It will be important to continue to monitor these trends and evaluate if supply and demand patterns differ from those modeled in the report due to changing practice patterns or changes in cancer incidence and prevalence patterns.

Inflow of New Oncologists

Basic data on the number of fellows entering and completing training is published annually in the September Medical Education issue of the *Journal of the American Medical Association* and can provide valuable data on the demographic trends of fellows entering oncology, such as the percentage of females and the percentage of international medical graduates. The model assumed that approximately half of the entering fellows would be female and if that percentage rises, it could have important implications for overall visit capacity. Tracking the percentage of international medical graduates in the field will help to assess if the specialty is remaining competitive with other specialties in terms of attracting U.S. medical graduates. While most programs regularly submit data on their fellows to the AAMC/AMA as part of the graduate medical education (GME) census, participation is voluntary and the reported data may undercount the number of oncology fellows. Additionally, the JAMA medical education issue does not include data on the number of gynecologic oncologists.

Data on the number of first-time board test takers is another source of data on the number of oncologists who are entering the workforce as most oncologists eventually become board certified. These figures can be obtained from the American Board of Internal Medicine (ABIM), the American Board of Pediatrics (ABP), and the American Board of Obstetrics and Gynecology (ABOG).

Monitoring Electronic Residency Application Services (ERAS) data on the number of applicants to oncology fellowship programs and to other internal subspecialties will also be an important barometer of future interest in the specialty and can help determine whether the specialty experiences a dip in the number of applicants.

An annual survey of ASCO program directors could confirm the published data on the oncology fellowship trends, and more importantly, allow ASCO to stay attuned to planned enrollment increases. The AAMC conducts a similar survey of the 125 medical school deans each year, and this survey has helped the AAMC to assess planned enrollment increases for the coming five years and, hence, graduates for the next nine years. While the AAMC survey is approximately 10 questions, a brief 3-question annual survey administered electronically might be sufficient:

- How many fellows will complete training this year? ____
- How many fellows will enter training this July? ____
- Do you plan to increase enrollment in the next three years? If yes, by how many slots? ____

This survey could also ask questions regarding the number and adequacy of the applicant pool for oncology as well as barriers to program expansion.

Oncologist Workforce Supply and Demographics

As oncologists enter the workforce and older oncologists retire, it will be important to continually assess the changing demographics and visit capacity. Given that approximately 65% of practicing oncologists are members of ASCO, adding a few supplemental questions to the ASCO membership and renewal forms could provide a valuable data source on the oncologist

workforce at a very small cost. The ASCO membership database currently provides data on the age, gender, practice setting, and specialty mix of the oncologist workforce. Adding a handful of workforce questions to the ASCO membership and renewal form could provide an ongoing source of data on retirement plans of oncologists, work hours, and wait time for an appointment. This will allow ASCO to identify important trends in retirements or visit capacity without undertaking new surveys or research efforts. Minimum recommended data elements would include:

- Plans to retire or reduce patient care hours in the next 12 months;
- Number of hours worked per week;
- Percentage of time on patient care activities;
- Patient visits per week; and
- Number of business days to wait for a new patient appointment.

The AAMC is currently working with over 35 specialty societies to develop a set of core questions that will help track supply and demand. This will allow for comparison across specialties. It will be important to ensure that the demographic characteristics that ASCO is already capturing are formatted to be consistent with how the other specialties are defining such variables as practice setting. ASCO is one of the represented specialties and will receive continued updates as the data collection elements are developed and finalized.

Reviewing the AMA Physician Masterfile data and comparing it to the ASCO membership database on an annual basis will help ASCO determine if the membership database adequately reflects the physicians in the Physician Masterfile self-identifying as oncologists. Reviewing both databases on the demographic and practice characteristics and comparing this to visit data developed from the Survey of Clinical Oncologists would give ASCO an indicator of changes in visit capacity from the existing workforce.

Supplemental Questions to Membership Forms

It would also be helpful to periodically add questions to the ASCO membership form regarding use of nurse practitioners and physician assistants, availability of part-time hours in oncology practices, use of electronic medical records, or other practice models that could lead to improved

efficiency. This will provide insight into how oncology care is changing and what options remain for increasing visit capacity.

Demand for Oncologist Services

It will be important to monitor changes in cancer incidence and prevalence in order to compare actual data with the projections. While overall cancer incidence rates have remained fairly stable over the past 10 years, there are some encouraging trends (such as the recent finding regarding lower breast cancer incidence) and discouraging trends (such as the increase in lung cancer in women) that will need to be monitored to determine if the overall projected demand estimates are accurate or not.

Table 21: Recommended data elements and sources

Data Element	Available Published Data	Original Data Collection
New Entrants		
Number entering oncology fellowship programs	JAMA publishes this data annually in the September Med Ed issue. This allows for trends but there is a one-year lag in reporting and it likely undercounts the number of fellows. ABIM, ABP, and ABOG regularly publish data on the number of first-time oncology board test takers.	ASCO can conduct a brief (3-5 question) annual Survey of Clinical Oncology Fellowship Program Directors regarding their current enrollment, number completing training, and plans to increase positions. ASCO can also play a role in encouraging program directors to complete the GME Track survey (source for the JAMA Med Ed data).
Number of oncology programs and plans for expansion	JAMA publishes this data annually in the September Med Ed issue. This allows for trends but there is a one-year lag in reporting. ASCO can also seek data from ACGME on accredited programs.	
Number of applicants to oncology fellowship programs	Nearly all oncology programs participate in ERAS, which provides data on the number of applicants each year.	
Demographics of Current Supply		
Practicing Oncologists	Maintained in ASCO membership database. Published in the AMA's Physician Characteristics and Distribution in the U.S. – though the PCD undercounts the number of	Regular comparison with the AMA Physician Masterfile will ensure ASCO members represent the full oncologist workforce.

	oncologists as it only reports those with a primary specialty listing of oncology and MDs (no DOs).	
Physician age	Maintained in ASCO membership database.	
Physician gender	Maintained in ASCO membership database.	
Practice setting	Maintained in ASCO membership database and should be updated each year through membership renewal data.	
Work Hours and Plans for Retirement		
Work hours	N/A	Adding questions to the ASCO membership and renewal forms can track: <ul style="list-style-type: none"> • hours worked per week and percentage of time on patient care activities • average wait time for a new patient appointment • plans to retire or reduce patient care hours in the next 12 months
Wait time for a new patient appointment	N/A	
Plans for retirement	N/A	
Cancer Cases and Visit-rates		
Cancer incidence and prevalence trends	The National Cancer Institute publishes annual data on cancer incidence and prevalence.	N/A
Oncologist visit-rates	NCI provided visit-rate data to AAMC for the workforce study – this is currently not a regular NCI publication.	Continued analysis of the SEER data on visit-rates will help monitor important utilization trends.

Additional Options to Consider for Tracking Supply and Demand

Periodic Surveys

While the data elements described above will provide an ongoing source of information on oncologist supply and demand trends, ASCO should consider administering the Survey of Clinical Oncologists to a sample of practicing oncologists every five years.

ASCO should consider conducting the Survey of Fellows Completing Training periodically in order to continue to monitor aspects of supply and demand. Since this survey can be done electronically and ASCO has the e-mail addresses of oncology fellows, the survey should be low cost and relatively easy to conduct. A survey every other year would provide very informative

trend data on both supply (educational and practice characteristics and location) and demand (current job market, job offers, and starting compensation).

ASCO might also consider developing and administering a periodic survey of employers of oncologists, such as medical groups, medical schools, and hospitals to explore how employers are responding to recruitment and retention challenges as well as assessing their difficulty or ease in recruiting oncologists and their expected hiring plans.

Explore Regular Data Exchange with AMA

As not all practicing oncologists are members of ASCO, it would be helpful to explore a data exchange with the AMA that could inform ASCO regarding the number and practice location of nonmembers. In exchange, ASCO could provide the AMA with updated contact information on ASCO members.

Oncologist Workforce Data Set

It will be helpful to develop a continually updated workforce data file that captures the basic demographic information on initial membership and then is updated annually with the workforce data elements collected in the membership and renewal forms. If any supplemental questions are added to the membership and renewal forms on a particular year, those elements could be added to the Workforce Data Set. Data from previous years or from other periodic surveys could be linked through a member ID. ASCO could also consider updating the Workforce Data Set with the names and contact information of fellows in training, regardless of whether they become ASCO members or not.

Longitudinal Cohort Study

A more ambitious approach to tracking workforce trends would be periodic surveys of a small cohort of oncologists. This would provide ASCO with an informative picture of how oncology practice is changing over time as well as the life cycle of a practicing oncologist. This cohort could be surveyed every several years to better understand their attitudes and practice patterns.

Conclusion

Given the looming prospect of a severe shortage of oncologists and the numerous alternate supply and demand scenarios that could take shape over the coming years, it will be extremely important for ASCO to continually monitor oncologist supply and demand trends.

Many of the data elements can be obtained through regularly published sources such as:

- JAMA Medical Education Issues
- ERAS Data
- AMA Physician Masterfile
- *AMA's Physician Characteristics and Distribution in the U.S.*
- Board Certification data published by ABIM, ABP, and ABOG
- SEER data on cancer incidence and prevalence rates

ASCO could also consider additional data collection efforts, such as:

- Survey of program directors regarding current number of fellows and plans to increase slots
- Workforce questions added to ASCO membership and renewal forms

Finally, ASCO could consider periodic surveys to supplement ongoing data collection efforts, such as:

- Random sample of practicing oncologists
- Fellows completing training
- Employers of oncologists
- Longitudinal cohort study

Collecting, compiling, and sharing this data with ASCO members and the public will help guide national policy and provide valuable insight regarding the nation's ability to forestall the predicted shortage of oncologists.

Appendix A: Results of Survey of Fellows Completing Clinical Oncology Fellowship Training in 2005

In June 2005, ASCO and the AAMC Center for Workforce Studies conducted a survey of fellows who were completing training in one of four oncology program areas: 1) medical oncology, 2) hematology/oncology, 3) pediatric hematology/oncology or 4) gynecologic oncology. Participants were asked to describe their job search activities and future practice plans. A total of 214 out of the 429 fellows contacted completed the survey, yielding a 50% response rate. 22% of the respondents were completing training in medical oncology; 57% in hematology/oncology; 17% in pediatric hematology/oncology; and 4% in gynecologic oncology. 52% of the respondents were male; 48% female. 32% were international medical graduates.

Key Findings

- 80% of fellows rated the quality of their fellowship training as ‘very good’ or excellent’, but significantly fewer were as satisfied with the assistance with job placement (32% ‘very good’ or ‘excellent’).
- 89% percent of the respondents had started their job search at the time of the survey and on average applied for five or more positions. Nearly all (88%) of those who started their search had accepted a position and two-thirds of those had their choice of two or more job offers.
- Practice setting varies significantly by specialty. Approximately three out of four pediatric hematologist/oncologists and gynecologic oncologists (78% and 75%, respectively) found jobs in an academic setting whereas only 41% of hematologist/oncologists and 62% of medical oncologists went into academic settings. Two fellows accepted jobs in industry and one in government.
- While there is not a large difference in the number of hours worked per week by practice setting (57/week for academic and 56/week in private practice), there is significant variation in anticipated patient care hours. Those going into academics anticipate

spending half the amount of time in oncology-related patient care than those going into private practice (39% versus 80%).

- When asked about which factors were ‘extremely important’ in their decision to pursue oncology, the majority listed opportunities to provide direct patient care (63%), geographic location (62%), network of high quality peers (60%), opportunity to balance work and professional life (60%), and spousal/partner employment opportunities (50%). Only 20% rated salary/pay as very important.
- Fellows going into academic settings were more likely to rate the availability of research and teaching opportunities as ‘extremely important’ to their post-training plans compared to those entering private practice and were less likely to rate salary, benefits or direct patient care opportunities as ‘extremely important’.
- Fellows were more than twice as likely to agree there were ‘many’ private practice positions available (67%) than academic (30%) or research positions (27%).
- Starting salaries are significantly lower for academic positions than for private practice. 81% of those in academic settings earned less than \$150,000, whereas 62% of those in private practice will earn \$200,000 or more.
- Over two-thirds (69%) of those who received a job offer also reported receiving one or more of the following sign-on benefits: moving expenses (52%), cash incentive (24%), practice support (14%), or loan assistance (5%). Those going into private practice were more likely to receive sign-on benefits compared to those going into academics (77% versus 48%, respectively).
- There is no relationship between the number of job offers received and expected income, nor is there statistically significant variation in income by gender, race or region of the country.
- While 39% of fellows had no educational debt, 27% reported having \$100,000 or more in education-related debt at the time of the survey.

Appendix B: Results of the 2005 Survey of Oncology Fellowship Program Directors

In fall 2005, ASCO and the AAMC Center for Workforce Studies conducted a Survey of Clinical Oncology Fellowship Program Directors in four oncology program areas: 1) medical oncology, 2) hematology/oncology, 3) pediatric hematology/oncology and 4) gynecologic oncology. Program directors were asked to provide data on the number of fellowship positions available, an assessment of the oncology job market, and plans to expand fellowship positions. The survey was administered to 242 program directors and received a 67% response rate. 7% of the respondents were program directors of medical oncology programs, 53% of hematology/oncology programs, 25% of pediatric hematology/oncology programs, and 15% of gynecologic oncology programs.

Key Findings

- There is strong and growing interest in clinical oncology fellowships as evidenced by the large number of applications (108) each program received on average for the 2006-07 academic year and because half of the program directors (50%) said the number of applicants has increased over the past three years.
- 91% of the program directors rated the quality of applicants as ‘excellent’ or ‘good’ and nearly half (47%) of the program directors feel that applicants are better compared to those who applied three years ago.
- While 83% of program directors feel they have adequate faculty to carry out their mission, three out of four program directors (77%) feel that demands for patient care revenue make it difficult for faculty to devote time and effort to fellowship training.
- Over half rated the overall adequacy of funding for the 2005-06 fellows as ‘excellent’ (17%) or ‘good’ (37%). Program funding sources varied based on the size of the program. Those with fewer than 5 slots received 74% of their funding from their home institution, while the larger programs relied on government, industry or philanthropic funding to cover nearly half of their program budget.

- Program directors report that many positions are available for exiting fellows and that the overall job market is stronger than it was three years ago. 80% of program directors feel there are many positions in the national job market, but are less likely to state there are many in their state or local market (51% and 25%, respectively). 32% feel the job market was better for the 2004-05 fellows than it was for the previous three years.
- Nearly half (46%) of the program directors feel we are not producing enough oncologists in their specialty to meet clinical needs, two-thirds (66%) think we are not producing enough for academic needs and 71% think we are falling short in research. However, only five programs have 'definite' plans to increase their program size between now and the 2010-11 academic year.
- Program directors cite the cost of expansion and the availability of financial support for fellows as the two most significant obstacles to increasing program size, with few rating lab space, training sites, faculty, or number of patients as significant barriers. Also, program directors have concerns about the quality of the applicant pool beyond a 30% expansion.
- Few program directors receive salary or other support to compensate for the additional workload, and 30% plan to step down in the next three years.

Appendix C: Results of the 2006 Survey of Clinical Oncologists

In the spring of 2006, ASCO and the AAMC Center for Workforce Studies surveyed a random sample of 4,000 oncologists listed in the AMA Masterfile as having a primary or secondary specialty in 1) medical oncology, 2) hematology/oncology, 3) pediatric hematology/oncology, or 4) gynecologic oncology. Participants were asked to describe their current practice setting, work hours, use of NPs/PAs, practice concerns, feelings of burnout, and assessment of the oncology marketplace. The survey received a 42.5% response rate. 22% of the respondents were medical oncologists; 55% hematologist/oncologists; 11% pediatric hematologist/oncologists; and 4% gynecologic oncologists. 7% indicated they were not clinical oncologists. 74% of the respondents were male; 26% female. 24% were international medical graduates.

Key Findings

- Nearly all (92%) currently active oncologists indicated they work full time with only 8% indicating they work part time. Females are twice as likely to work part time as males (13% versus 6%) and probability of working part time increases with age.
- 57% of respondents described their principal work setting as private practice; 32% as academic; and the balance are in government (2.4%), industry (2.4%) or other settings (5.6%). Respondents could further describe their setting and could check all that apply. Group practices were the most likely to be selected with nearly half (46%) describing their practice as single- or multi-specialty group practice. Other frequently selected settings included teaching hospitals (33%), medical schools (15%), and faculty practice plans (10%).
- The average reported number of hours worked per week is 53.7. There is not significant variation in work hours by specialty, but there is by practice setting. Academics tend to work 56.3 hours per week on average compared to 53.1 for those in private practice. More importantly, the percentage of time spent on patient care activities varies significantly by setting, with academics spending much less time on patient care (54%

versus 90%) and more on teaching and research than those in private practice. Visit-rates are significantly higher for private practice oncologists across all age and gender categories.

- 59% of the respondents are salary-based and 39% are productivity-based (self-employed practice income or RVUs). 45% of oncologists are owner/partners of their organization, and 53% are employees. Females and academics are more likely to be salary-based and to be employees.
- Two-thirds of respondents indicated the typical wait time for a new patient appointment is five business days or less. 10% said the typical wait was greater than 10 business days. Pediatricians have lower mean wait times (2.3 days) compared to hematologist/oncologists (5.9 days) and gynecologic oncologists (7.1 days).
- There is strong interest in part-time hours. While only 8% currently work part time, another 40% are interested in this as an option. However, there is limited availability of part-time options as most respondents (58%) indicated part-time hours are not available at their practice.
- There seems to be a sense that the workload has increased over the past two years, with approximately half saying the number of hours worked and number of new patients and patients in remission has increased. 34% expect their oncology-related patient care hours to increase over the next three years.
- Over half (56%) work with a nurse practitioner or physician assistant. 30% use NPs/PAs mainly for the traditional scope of practice such as patient education and counseling, pain and symptom management, and to manage patients during visits. 26% regularly use NPs/PAs for more advanced activities such as assisting with new patient consults, ordering routine chemotherapy, or performing invasive procedures. Over two-thirds of those who work with NPs/PAs agree that the use of NPs/PAs leads to improved practice efficiency and quality of patient care, and contributes to their professional satisfaction. Those who regularly work with NPs/PAs in advanced roles are even more likely to agree with these statements.

- Nearly one-third (31%) of oncologists indicated their patients ‘never’ or ‘rarely’ see a primary care physician when they are undergoing active cancer care treatments and were twice as unlikely to see a pain and symptom management specialist or hospitalist during active treatment. However, 86% indicated patients at the end-of-life and no longer in active treatment for their cancer ‘usually’ or ‘always’ see hospice.
- When asked to rate their practice concerns, most expressed concern with time spent on documentation and paperwork (76%), insufficient reimbursement rates (70%) insurance coverage restrictions (56%), effort needed to keep up with clinical advances (54%), financial security for retirement (51%) and the emotional toll of caring for cancer patients (51%). Private practice oncologists were significantly more likely to be concerned with reimbursement rates, insurance coverage restrictions, medical liability and malpractice, the number of under-insured patients, and practice management responsibilities than those in academic settings.
- 70% of respondents indicated they are satisfied with their overall career in medicine; although decidedly fewer are satisfied with their practice income (37%) or the time they have available for family and personal life (26%). Not surprisingly, academics are more likely to be satisfied with time to teach and ability to participate in clinical trials than private practice oncologists and less likely to be satisfied with their practice income.
- Approximately one out of three oncologists reports feelings of burnout once a week or more. These results are consistent with a 2002 ASCO survey on burnout. Academics are less likely to report feeling burned out once a week or more compared to private practice oncologists (25% and 36%, respectively). However, two out of three oncologists (63%) are likely to report feeling exhilarated once a week or more after working closely with patients and results are similar across settings. Interestingly, comments related to burnout centered more on administrative requirements, reimbursement, and lack of free time than on emotional issues related to treating patients with cancer.
- The average age practicing oncologists expected to retire was 64.3 years. Those who reported feeling burned out once a week or more had lower average age of retirement than those who experienced feelings of burnout less than once a week (62.1 versus 65.2, respectively.)

- While only 28% feel there is a current shortage of oncologists in their community, 46% are concerned about a future oncology workforce shortage.
- When asked about how we might best address future shortages, respondents were most likely to cite reductions in paperwork and increased use of information technology as having significant potential. They also saw possibility in the prospect of increasing/extending the oncology workforce by training more oncologists, increased use of NPs/PAs and oncology nurses, and by creating incentives for physicians to delay retirement. Few saw any potential in the increased use of other specialists to address oncology shortages.

Appendix D: Results of the Survey of Oncology Fellows Entering Training in 2006

In May 2006, ASCO and the AAMC Center for Workforce Studies conducted a survey of fellows who would be entering training in July 2006 in one of four oncology program areas: 1) medical oncology, 2) hematology/oncology, 3) pediatric hematology/oncology or 4) gynecologic oncology. Participants were asked to describe what led them to select the field of oncology and their particular fellowship program. The survey was administered to 438 fellows and received a 62% response rate. 51% of the respondents were male; 49% female. 35% were international medical graduates. 11% of the respondents were entering medical oncology programs, 62% hematology/oncology, 19% pediatric hematology oncology, and 9% gynecologic oncology.

Key Findings

- The majority of respondents (57%) decided to pursue oncology training before entering their residency training, 38% decided on oncology during residency training, and 4.7% decided after practicing in a different area of medicine.
- Nearly all respondents participated in an oncology rotation during residency training (for 71%, it was required; for 27%, it was optional), but there were a handful (3%) who did not participate in an oncology rotation.
- Most respondents seriously considered pursuing a career in another area of medicine before deciding on oncology. 27% were considering general practice (internal medicine, pediatrics or gynecology) and 37% were considering other specialties. The top three other subspecialties were cardiology, gastroenterology, and infectious disease.
- When asked about which factors were ‘extremely important’ in their decision to pursue oncology, the majority listed the ability to affect outcomes for patients with life-threatening illnesses (69%), opportunity to build trusting relationships with patients (67%), intellectual challenges of the specialty (64%), recent therapeutic gains and scientific progress (57%), and the medical content of the specialty (53%). Only 8% rated income potential as extremely important to their decision to pursue oncology, although one-third expect to make \$200,000 or more during their first year of practice.

- One out of two respondents expressed ‘moderate’ to ‘significant’ concern regarding the stress of an oncology practice, dealing with death and dying, and making difficult ethical/end-of-life decisions.
- Most respondents (66%) applied to 10 or fewer oncology programs for the 2006-07 academic year. Respondents were most likely to rate program location (40%) and research opportunities (39%) as being ‘extremely important’ when selecting the program they will be attending. Only 12% rated opportunity to work with a particular faculty member as extremely important.
- When seeking out information on a career in oncology, most turned to oncology fellows (73%), practicing oncologists (65%), or mentors in their residency program (65%). Approximately half (48%) visited oncology fellowship program Web sites, and only 23% read articles on oncology practice.
- While 38% of fellows had no educational debt, 32% reported having \$100,000 or more in education-related debt at the time of the survey.

Ethical decision-making	<input type="radio"/>					
Pain management	<input type="radio"/>					
Talking about death and dying	<input type="radio"/>					
Palliative care	<input type="radio"/>					
Cultural competency	<input type="radio"/>					

5. When you think back as to why you selected the particular fellowship program you are now completing, did it meet your expectations?
 Very much Somewhat Not at all
 If not, why not? (insert comment field)

6. What type of research were you involved in during your fellowship? (*Check all that apply*)
 - Clinical trials (protocol development/management)
 - Clinical trials (participation)
 - Bench Research
 - Translational Research
 - Health services/outcomes research
 - Other, specify: _____
 - None

7. Did you take an additional year of research-intensive training (beyond requirements for board certification)? Yes No

8. Would you recommend your Oncology specialty to medical students or physicians in training?
 Yes No

B. PERSPECTIVE ON POST-TRAINING PRACTICE

1. Are you planning on pursuing a career in oncology immediately after completing your current fellowship?
 Yes No Undecided

[A branching question for those who selected 'No' or 'Undecided' in Question 1.]

What are the main reasons that you are not pursuing (or are undecided about) a career in oncology? (*Mark all that apply*)

- To further my medical training (please specify area)
- To pursue another specialty (please specify area)
- Unable to find a satisfying position
- Unable to find any position
- Temporary hiatus (to have a family, military/voluntary service, etc.)
- Decided against a career in oncology
- Felt the training from the current program was not sufficient
- Other, specify: _____

2. How important are each of the following factors in deciding your post training practice plans?

	Not Important		Somewhat Important		Extremely Important
<i>PRACTICE ENVIRONMENT</i>					
Opportunity to focus on a particular cancer type	<input type="radio"/>				
Opportunities to do research	<input type="radio"/>				
Opportunities to teach/work with medical students, residents and fellows	<input type="radio"/>				
Opportunities for a broad-based clinical practice	<input type="radio"/>				
Opportunity to provide direct patient care	<input type="radio"/>				
Prestige of employer	<input type="radio"/>				
Opportunity to work in a multispecialty practice	<input type="radio"/>				
Opportunity to work in a small practice	<input type="radio"/>				
Opportunity to treat underserved populations (eg, inner city, rural, etc.)	<input type="radio"/>				
<i>RESOURCES</i>					
Network of high quality peers	<input type="radio"/>				
Quality of research facilities (lab space, equipment, etc.)	<input type="radio"/>				
Number of support staff available to you	<input type="radio"/>				
Access to the latest information technology (electronic medical record, PDAs, etc.)	<input type="radio"/>				
<i>EMPLOYMENT</i>					
Job security	<input type="radio"/>				
Opportunity to attain partnership / tenure	<input type="radio"/>				
Timeframe for attaining partnership / tenure	<input type="radio"/>				
Salary / pay	<input type="radio"/>				
Benefit package	<input type="radio"/>				
Guaranteed minimum salary	<input type="radio"/>				
Option of productivity/incentive income	<input type="radio"/>				
<i>LOCATION</i>					
Geographic area (west coast vs. east coast, etc.)	<input type="radio"/>				
Proximity to your fellowship training site	<input type="radio"/>				
Proximity to family	<input type="radio"/>				
Spousal/partner employment opportunities	<input type="radio"/>				
<i>WORK SCHEDULE</i>					
Minimal on-call requirements	<input type="radio"/>				
Flexible scheduling	<input type="radio"/>				
Opportunity to balance work and personal life	<input type="radio"/>				
Leisure/family time	<input type="radio"/>				

3. How extensively do you expect to be involved in **research** during your medical career?

Exclusively

- Significantly involved
- Somewhat involved
- Not involved

4. What type of research do you expect to be involved in after completion of your fellowship?

(Check all that apply)

- Clinical trials (protocol development/management)
- Clinical trials (participation)
- Bench Research
- Translational Research
- Health services/outcomes research
- Other, specify: _____
- None

5. Are you interested in pursuing a career in academic medicine?

- Yes, it is my preferred choice
- Would consider a career in academic medicine but it is not my first choice
- Not interested in a career in academic medicine but would consider training fellows on a part-time or volunteer basis
- Not interested

Comments: What are the pros and cons of a career in academic medicine?

C. JOB SEARCH EXPERIENCE

1. Have you actively searched for employment?

- No, not yet → skip to D1
- Yes, I am currently looking
- Yes, and I have accepted a position or will be self-employed

2. How many positions have you applied for, how many interviews have you had, and how many offers have you received to date for **all positions** that you applied for:

of Positions Applied for: _____

of Interviews Conducted: _____

of Offers Received: _____

3. If you have accepted a position, was it your first choice? Yes No

4. Did you have a difficult time finding a position you were satisfied with?

- No
- Yes → If **Yes**, what were the **main reasons**? *(Mark all that apply.)*
 - Overall lack of positions / practice opportunities
 - Lack of positions in desired locations
 - Lack of positions in desired practice setting
 - Inadequate salary/compensation offered
 - Limited opportunities due to visa status
 - Family considerations
 - Other, specify: _____

5. Did you have to expand/change your job search plans because of limited job opportunities?
 Yes No
 → If **Yes**, how did you change your plans?
 I accepted or decided to accept an employment that is or has (*Mark all that apply*):
 Applied for job(s) in a different area of the state
 Applied for job(s) in a different region of the country
 Applied for job(s) with professional activities/focus different from my preferred activities/focus
 Applied for job(s) with different work arrangement (e.g., part-time, work with more on-call hours, etc.)
 Applied for job(s) with less desirable salary/compensation package
 Applied for job(s) in a less desirable practice setting
 Other, specify: _____
 Decided to continue training
 Other, specify: _____

6. What is your assessment of the *opportunities for clinical practice* in your oncology specialty?

	No positions		Some positions		Many positions	Don't know
	1	2	3	4	5	
Within 50 miles of your training site(s)	<input type="radio"/>					
Nationally	<input type="radio"/>					

7. What is your assessment of the *opportunities in academic medicine* in your oncology specialty?

	No positions		Some positions		Many positions	Don't know
	1	2	3	4	5	
Within 50 miles of your training site(s)	<input type="radio"/>					
Nationally	<input type="radio"/>					

8. What is your assessment of the *opportunities in research* in your oncology specialty?

	No positions		Some positions		Many positions	Don't know
	1	2	3	4	5	
Within 50 miles of your training site(s)	<input type="radio"/>					
Nationally	<input type="radio"/>					

D. Employment Plans / Opportunities

- How many hours do you expect to be working in a typical week? ____ hours/week
- What percent of these hours do you expect to be devoted to the following activities?

Activities

Percent of work week

Oncology Patient Care

%

Non-oncology related primary care	%
Research	%
Teaching	%
Other, specify:	%
100%	

3. a. How would you generally characterize the setting of your expected principal practice after completion of your training? (*Mark only one.*)

	Principal (<i>mark one</i>)	Secondary (<i>mark one</i>)
Academic Setting	<input type="radio"/>	<input type="radio"/>
Private Practice	<input type="radio"/>	<input type="radio"/>
Government	<input type="radio"/>	<input type="radio"/>
Industry	<input type="radio"/>	<input type="radio"/>
Other, specify: _____	<input type="radio"/>	<input type="radio"/>

b. More specifically, what term best describes your anticipated employment setting after completing your fellowship (check one)?

- Solo Practice
- Partnership (2 physicians)
- Group Practice – Single-Specialty (hematology and/or oncology only)
- Group Practice – Multiple-Specialty (hem/onc plus other specialties)
- Staff Model HMO
- Hospital
- Medical School
- U.S. Government – Agency (e.g., NIH, etc.)
- U.S. Government – Military/VA
- State or Local Health Department
- Hospice
- Private Industry (Pharmaceuticals, biotech firms, etc.)
- Temp Agency
- Other, specify: _____

c. If you selected ‘**Group Practice**’ (‘Single- or Multiple-Specialty’) above, will you be the owner or partner of the practice?

- Owner Partner Option to become owner or partner in the future
- None of the above Don’t know

d. Will this position be part of a university/academic faculty practice plan? Yes No Don’t know

4. How will you be compensated at your principal practice?

- Salary without incentive
- Salary with incentive
- Self-employment practice income
- Other, specify: _____
- Don’t know

5. Will you receive any of the following sign-on benefits as part of your agreement for your upcoming position? (*check all that apply*)
- Cash incentive (sign on bonus)
 - Moving/relocation expenses
 - Mortgage loan reduction
 - Student loan reduction
 - Practice support (first six months or other set time period)
 - Other, specify:
 - None of the above

6. What is your **expected income** during your first year of practice (all sources)?
- | Annual Base Salary/Income | Anticipated Annual Productivity-Related Incentive Income |
|---|--|
| <input type="radio"/> Less than \$125,000 | <input type="radio"/> No incentive Income |
| <input type="radio"/> \$125,000 - \$149,999 | <input type="radio"/> Less than \$20,000 |
| <input type="radio"/> \$150,000 - \$174,999 | <input type="radio"/> \$20,000 - \$39,999 |
| <input type="radio"/> \$175,000 - \$199,999 | <input type="radio"/> \$40,000 - \$59,999 |
| <input type="radio"/> \$200,000 - \$224,999 | <input type="radio"/> \$60,000 - \$79,999 |
| <input type="radio"/> \$225,000 - \$249,999 | <input type="radio"/> \$80,000 - \$100,000 |
| <input type="radio"/> \$250,000 - \$274,999 | <input type="radio"/> Over \$100,000 |
| <input type="radio"/> \$275,000 - \$300,000 | |
| <input type="radio"/> Over \$300,000 | |

7. How satisfied are you with your anticipated salary/compensation?
- Very Satisfied
 - Somewhat Dissatisfied
 - Somewhat Satisfied
 - Very Dissatisfied

8. How would you view your new position?
- I view my new position as:
- Short-term/transitional
 - Semi-permanent/don't foresee a particular end date but might change at some point
 - Permanent and/or partner/tenure track

9. Where will your principal practice be located? *Please provide zip code, if it is unknown, please provide City/Town and State of your practice location.*

Zip Code: _____ City/Town: _____ State: _____

10. Will you be practicing in a federally designated Health Professional Shortage Area (HPSA)?
- Yes
 - No
 - I don't know
- B. Do you have an obligation such as the National Health Service Corp (NHSC) and the National Loan Payment Program (LPR), or visa requirement to work in a HPSA?
- Yes
 - No

E. DEMOGRAPHIC INFORMATION

1. Gender:
- Female
 - Male
2. Year of Birth: 19__
3. Current Citizenship Status:

- Native Born U.S. Citizen
- Naturalized U.S. Citizen
- Permanent Resident
- H-1, H-2, H-3 Temporary Worker
- J-1, J-2 Exchange Visitor
- Other, specify: _____

4. A) Race (optional):

- Asian or Pacific Islander
- Black/African American
- Indian Subcontinent
- Middle Easterner
- Native American/Alaskan
- White
- Other, specify: _____

5. Hispanic Origin:

- Non-Hispanic
- Cuban
- Mexican, Mexican American
- Puerto Rican
- Other, specify: _____

F. MEDICAL SCHOOL EDUCATION AND TRAINING

1. Where did you go to medical school:

- US Allopathic Medical School (MD)
- US Osteopathic Medical School (DO)
- Canadian Medical School
- International (please specify country)_____

2. Year of medical school graduation: _____
3. Where did you complete your last residency (prior to your current fellowship)? ____ (state or Canada)
4. Other graduate degree(s) that you hold (*Check all that apply*):
 - PhD DPH Other Doctorate
 - OMBA OMPH MSW JD Other Master's degree
5. What was your level of **education-related debt(s)** when you finished medical school?
 - I didn't have any debt
 - less than \$25,000
 - between \$25,000 and \$49,999
 - between \$50,000 and \$74,999
 - between \$75,000 and \$99,999
 - between \$100,000 and \$144,999
 - between \$150,000 and \$199,999
 - \$200,000 or more

a) If you have debt, did your level of debt affect your decision to seek an oncology specialty?

Yes No

G. COMMENTS

Please provide any additional comments or observations you may have about your training experiences in your Oncology specialty and/or the employment opportunities for Oncologists:

THANK YOU FOR TAKING THE TIME TO HELP IN THIS STUDY!

Please return your completed questionnaire to:

[Address & contact information]

Survey of Clinical Oncology Fellowship Program Directors
2005 Survey of Oncology Fellowship Program Directors

The American Society of Clinical Oncology (ASCO)

and

Center for Workforce Studies

Association of American Medical Colleges (AAMC)

This survey is designed to gather information on clinical oncology fellowship programs, program directors, and fellows and their practice opportunities. Your response will be kept strictly **confidential**. Only the staff of the AAMC Center for Workforce Studies will have access to your individual responses. Study results will be reported only in aggregate.

Please mark only one answer for each question unless otherwise directed.

A. FELLOWSHIP PROGRAM BACKGROUND

Please enter Survey ID (or an ACGME or other program #): _____

1. Please indicate your program area:

- Medical Oncology Hematology/Oncology Pediatric Hematology/Oncology
 Gynecologic Oncology Other, specify: _____

2. Please provide the numbers of fellowship positions available, fellows who ***began/will begin training*** and fellows who ***completed training*** in your program during the following academic years. Please estimate figures in future years to the best of your ability.

Academic Year	# of Positions available	# of Fellows who <i>began/will begin training</i>	# of Fellows who <i>completed training</i>
2001-02	_____	_____	_____
2002-03	_____	_____	_____
2003-04	_____	_____	_____
2004-05	_____	_____	_____
2005-06	_____	_____	_____
2006-07	_____	_____	_____

3. For **2006-07** applicants, please provide the total number of applications you received, the number of applicants you interviewed, and the number you accepted into the program.

- _____ Total number of completed applications received for 2006-07 program
 _____ Number of applicants interviewed
 _____ Number of fellows accepted to the program

B. CHARACTERISTICS OF APPLICANTS AND FELLOWS

4. How would you rate the overall qualifications of *applicants* for the **2006-07** program?

- Excellent Good Acceptable Poor Very Poor

5. How do the **2006-07** applicants compare with those from three years ago?

Far better Better About the same A little less qualified Far less qualified

6. Has the number of applicants to your program increased or decreased over the past three years?

Increased Stayed the same Decreased

7. Do you have enough qualified candidates to fill the available slots? Yes No

8. How many fellows have dropped out of your fellowship program in the past three years?
 _____ (number of fellows that dropped out of your fellowship program)

9. Of those who dropped out of your program, how many have left your oncology specialty entirely?
 _____ (number of fellows that dropped out of oncology altogether)

C. FACULTY

10. Please indicate the number of faculty members by type engaged in your fellowship training.

Faculty Type	Total
Full-time	_____
Part-time	_____
Volunteer	_____
Adjunct	_____
Other, specify: _____	_____

11. Do you have adequate faculty to carry out your mission? Yes No

12. Do the demands for patient-care revenue make it difficult for faculty to devote time and efforts to fellowship training?

Yes No

If yes, is this a significant problem?

Very significant Somewhat significant Not significant

D. PROGRAM FUNDING

13. Please indicate funding sources to support current fellows:

Source	% of the Program Budget
Home Institution	_____ %
Federal/State Governments	_____ %
Industry	_____ %
Private Philanthropy/donations	_____ %
Other, specify: _____	_____ %

14. Have the funding contributions from the following sources changed compared to three years ago?

Source	Funding Increased	Funding Stayed the Same	Funding Decreased	N/A
_____	_____	_____	_____	_____

Home Institution	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Federal/State Governments	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Industry	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Private Philanthropy/donations	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Other, specify: _____	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

15. How would you rate the overall adequacy of funding for your **05-06** fellows?

- Excellent
- Good
- Acceptable
- Poor
- Very poor

E. ONCOLOGY SPECIALTY JOB MARKET

16. Indicate the approximate number of fellows who completed training in the past 3 years and the number of those who found employment in the following settings:

Total Number of fellows who completed training: _____

Number that went into each type of practice setting:

Academic Setting	_____
Private Practice	_____
Government/Military	_____
Industry (pharmaceutical, biotech)	_____
Other employment	_____
Unknown	_____

17. How would you rate the number of job offers that *the fellows who completed your training program during the 2004-05 academic year* received in the following areas?

Employment type	Many job offers	Some job offers	No job offers	Don't know/ N/A
Academic Setting	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Private Practice	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Government/Military	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Industry (pharmaceutical, biotech)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Other employment	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

18. How would you describe the career interests of fellows over the past three years?

	Increased significantly	Increased somewhat	Stayed the same	Decreased somewhat	Decreased significantly
Academic Setting	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Private Practice	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Government/Military	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Industry (pharmaceutical, biotech)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

19. How does the job market for *the fellows who completed training during the current (2004-05) academic year* compare to the job market for those who completed the fellowship during the previous 3 years?

The job market for *the 2004-05 fellows* who completed training is:

Far better	Better	About the same	Worse	Far Worse	Don't know
<input type="radio"/>					

20. What is your overall assessment of the practice opportunities in your **oncology specialty** (i.e. medical oncology, hematology/oncology, pediatric oncology or gynecological oncology) **within 50 miles of your training site(s), in your state, and nationally?**

	No positions		Some positions		Many positions		Don't know
	1	2	3	4	5		
Within 50 miles of your training site(s)	<input type="radio"/>						
In your state	<input type="radio"/>						
Nationally	<input type="radio"/>						

F. VIEWS ON EXPANDING ONCOLOGY FELLOWSHIP OPPORTUNITIES

21. Compared to the number of fellows accepted in the 2006-07 academic year, do you expect to increase the number of fellows that your program accepts between now and the 2010-11 academic year?

Yes No Not sure

↙

If **Yes**, please answer the following questions:

A) Is the increase definite, probable, or possible? definite probable possible

B) What is the expected number of new slots? ___ additional fellows/year

C) Why are you increasing? Check all that apply:

___ Perceived need or physician shortage in your oncology specialty (i.e. medical oncology, hematology/oncology, pediatric oncology or gynecological oncology) **in your state/region**

___ Perceived need or physician shortage in your oncology specialty (i.e. medical oncology, hematology/oncology, pediatric oncology or gynecological oncology) **in the nation**

___ Other(s) Please specify: _____

22. Please rate how much of a problem each of the following items **would be** to having additional fellows in **your program**.

	Not a problem		Moderate problem		Very significant problem	Don't know
Limited lab space	<input type="radio"/>	<input type="radio"/>				
Limited clinical training sites	<input type="radio"/>	<input type="radio"/>				
Limited research training capacity	<input type="radio"/>	<input type="radio"/>				
Limited clinical faculty	<input type="radio"/>	<input type="radio"/>				
Limited research faculty	<input type="radio"/>	<input type="radio"/>				
Limited ambulatory preceptors	<input type="radio"/>	<input type="radio"/>				
Limited mix or number of patients with appropriate diagnoses	<input type="radio"/>	<input type="radio"/>				
Costs of expansion	<input type="radio"/>	<input type="radio"/>				
Available financial supports for fellows	<input type="radio"/>	<input type="radio"/>				
Other, Specify: _____	<input type="radio"/>	<input type="radio"/>				

23. Do you think **the nation** is producing enough oncologists in your specialty (i.e. medical oncology, hematology/oncology, pediatric oncology or gynecological oncology):

	Yes	No	Unsure
To meet clinical needs	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
To meet academic needs	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
To meet research needs	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

24. How concerned would you be with the adequacy/quality of the applicant pool to support an expansion of fellowship slots **nationally** in your oncology specialty (i.e. medical oncology, hematology/oncology, pediatric oncology or gynecological oncology)?

	Not concerned at all	Somewhat concerned	Very concerned	Don't know
10% expansion	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
20% expansion	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
30% expansion	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
40 % expansion	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
50% or greater expansion	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

INFORMATON ON PROGRAM DIRECTORS

25. For how many years have you been the director of your program? ____ Years

26. Is your appointment time limited to a certain number of years? Yes, ____ year(s) No

27. Did your institution provide financial support to compensate for your assuming the position of fellowship program director?

Yes No

→ If **Yes**, please answer the following questions:

A) What percent of your salary does the institution provide for this service? _____%

B) Are you satisfied with the level of compensation? Yes No

28. Did your institution adjust your workload in order to accommodate your additional responsibility as a fellowship program director?

Yes

No

→ If **Yes**, please indicate kind of work arrangement that your institution provided. (*Check all that apply*)

Reduced patient care load

Reduced research requirements

Reduced administrative/committee work

Stopped tenure clock

Other, specify: _____

29. Have the recent requirements for resident work hours and supervision created difficulties for program administration? Yes No

30. Do you have an associate program director? Yes No

→ If **Yes**, What percent of his/her salary does the institution provide for this service? _____%

31. When do you plan to step down as director of your program?

Within the next 12 months

1 to 3 years

4 to 5 years

Over 5 years

I don't know

32. Gender:

Female

Male

34. Year of Birth: 19__ __

35. Current Citizenship Status:

Native Born U.S. Citizen

Naturalized U.S. Citizen

Permanent Resident

Non U.S. Citizen

36. Race (optional):

Asian or Pacific Islander

Black/African American

Indian Subcontinent

Middle Easterner

Native American/Alaskan

White

Other, specify: _____

37. Hispanic Origin:

Non-Hispanic

Cuban

Mexican, Mexican American

Puerto Rican

Other, specify: _____

38. A) Type of Medical Degree Received: MD DO

B) Location of Medical School:

United States → In which state? Please use the 2-letter abbreviation ('AL' for Alabama, etc.):

Canada

Other Country (specify: _____)

C) Other graduate degree(s) received (check all that apply):

PhD DPH Other Doctorate

MBA MPH MSW JD Other Master's degree

39. Appointment Information

A) Rank:

Full Professor

Associate Professor

Assistant Professor

Instructor

Other, specify: _____

40. **COMMENTS:** Please provide any additional comments or observations about the oncology workforce and fellowship training that cannot be captured from the questions above. If you also have comments regarding how ASCO might be able to help Oncology fellowship directors:

In the event the AAMC Center for Workforce Studies staff need to contact you for follow-up, please include the following contact information:

Name: _____

Email: _____ Phone: _____

Organization: _____

Please send in your responses using any of the three options listed below:

1. **MAIL** in your survey to:

Center for Workforce Studies

Association of American Medical Colleges

2450 N St. N.W., Washington, DC 20037

2. **FAX** in your survey to (202) 828-1125, AAMC, Center for Workforce Studies

3. **ONLINE** - Complete the survey online using customized link emailed to you by the Center for Workforce Studies, workforce@aamc.org

THANK YOU FOR TAKING THE TIME TO HELP IN THIS IMPORTANT STUDY!

2006 Survey of Clinical Oncologists

SURVEY OF CLINICAL ONCOLOGISTS

American Society of Clinical Oncology (ASCO)

and

Association of American Medical Colleges (AAMC)

Your response will be kept confidential and will be reported only in national and regional tabulations and summaries. Please return the completed questionnaire in the enclosed business reply envelope. Please mark only one answer for each question unless otherwise directed. You may complete this survey online at: <http://www.aamc.org/ascosurvey>

MARKING INSTRUCTIONS

- Use a No. 2 pencil or blue or black ink pen only.
 - Do not use pens with ink that soaks through the paper.
 - Make solid marks that fill the oval completely.
 - Make no stray marks on this form.
 - Do not fold, tear, or mutilate this form.
- CORRECT INCORRECT

A. CURRENT ACTIVITIES

1. How would you describe your current professional activities?

- Active **full time** in oncology (patient care, research and/or teaching)
- Active **part time** in oncology (patient care, research and/or teaching)
- Still in Residency/Fellowship Training as of 9-30-2005
- Active in medicine, but not oncology (describe _____)
- Inactive in medicine at the present time
- Retired from medicine

→ If you marked any of these responses, please stop here and return survey.

2a. Which of the following best characterizes your oncology practice?

- Medical oncology
- Hematology/oncology
- Pediatric hematology/oncology
- Gynecologic oncology
- None of the above

2b. If you do not provide the types of oncology services listed in question 2a, what is your primary specialty?

- Radiation oncology
- Surgical oncology
- Other (_____)

Please stop here and return survey.

3. During your most recent complete week of being active in medicine, how many hours did you spend working (not counting on-call)? _____ hrs

4. What is your on-call schedule?

5. During the past year, what percentage of your time was spent in the following activities?

- Oncology/malignant hematology patient care _____ %
- Non-oncology related patient care (including non-malignant hematology and primary care) _____ %
- Clinical research _____ %
- Laboratory/basic research _____ %
- Teaching/fellowship program activities _____ %
- Administration/leadership _____ %
- Other (specify: _____) _____ %

TOTAL: 100 %

B. WORK SETTING

6. What is the zip code of your principal work setting? If zip code is unknown, please provide the city and state.

Zip Code: _____

City/Town: _____ State: _____

7a. How would you generally characterize your principal work setting?

- Academic Setting
- Private Practice
- Government
- Industry – SKIP TO QUESTION 7d
- Other, specify: _____

7b. More specifically, how would you characterize your principal work setting? (Mark all that apply.)

- Teaching Hospital
- Medical School
- Faculty Practice Plan (single or multispecialty)
- Solo Practice
- Partnership (2 physicians)
- Single Specialty Group Practice
- Multispecialty Group Practice
- Community Hospital (non-teaching)
- Other, specify: _____

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PLEASE DO NOT WRITE IN THIS AREA

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7c. If you selected single- or multi-specialty group practice above, how many physicians work at your practice setting?
(Include both full-time and part-time physicians)

_____ physicians

7d. How many years have you been in your current principal position? _____ years

7e. How are you compensated at your principal work setting?

- Salary without incentive
- Salary with incentive
- Self-employment practice income
- Productivity model (% RVU or billing)
- Other, specify: _____

7f. How would you describe your position in the organization?

- Owner/Partner
- Employee
- Other

C. ONCOLOGY PRACTICE

8. Please describe your oncology practice.

- I have a general oncology practice
- I have a specialized oncology practice
- I do not see patients – SKIP TO SECTION F

9. How many patient visits did you have during your most recent complete week of practice?

a. Number of outpatient visits: _____ visits

Of those,

How many are new patient visits? _____ visits

How many are follow-up visits for patients 2+ years in remission? _____ visits

b. Number of inpatient visits: _____ visits

10. Currently, what is the typical waiting time for a new patient appointment in your practice?

Number of Business Days _____ Don't Know

11. In my work setting, part-time work hours are:

- Available and I currently work part-time
- Available and I am considering this for the future
- Available but I am not interested
- Not available but I would like the option
- Not available and I would not be interested if they were

12. Using a scale of 1-5 (1=Much Lower and 5=Much Higher) indicate how your practice has changed in the following areas compared to two years ago:

	Much Lower	No Change	Much Higher		
Average wait time for an appointment	1	2	3	4	5
Average amount of face-to-face time per patient	1	2	3	4	5
Number of new patients per week	1	2	3	4	5
Number of hours worked per week	1	2	3	4	5
Oncology related income	1	2	3	4	5
Number of patients 2+ years in remission	1	2	3	4	5

13. Are nurse practitioners/physician assistants likely to provide any of the following services for your patients? If you do not work with NPs/PAs skip to Question 15.

NPs/PAs are likely to...	Never	Rarely	Sometimes	Usually	Always
Assist with new patient consults	1	2	3	4	5
Manage patients during treatment visits	1	2	3	4	5
Order routine chemotherapy	1	2	3	4	5
Provide pain and symptom management	1	2	3	4	5
Perform invasive procedures (e.g., bone marrow, spinal tap)	1	2	3	4	5
Address emergent care	1	2	3	4	5
Provide follow-up care for patients in remission	1	2	3	4	5
Take night or weekend call	1	2	3	4	5
Conduct hospital rounds	1	2	3	4	5
Provide non-cancer related primary care for patients in active treatment	1	2	3	4	5
Provide patient education and counseling	1	2	3	4	5
Provide end of life/hospice care	1	2	3	4	5
Perform research related activities	1	2	3	4	5

14. Please rate your agreement with the following statements about NPs/PAs in your practice using a scale of 1-5 (1=Strongly Disagree and 5=Strongly Agree):

Use of NPs/PAs...	Strongly Disagree	Neutral	Strongly Agree		
Increases the efficiency of my practice	1	2	3	4	5
Allows me to spend more time on complex cases	1	2	3	4	5
Contributes to my professional satisfaction	1	2	3	4	5
Increases my workload due to supervisory requirements	1	2	3	4	5
Allows me to more easily participate in clinical research	1	2	3	4	5
Improves overall patient care	1	2	3	4	5

15. Thinking about the patients you have seen in the past month, what percentage could be classified as 'end-of-life' (less than six months to live)?

_____ %

16. While undergoing active cancer care treatments, how often do your patients also see any of the following providers?

	Never	Rarely	Sometimes	Usually	Always
Primary care physician	1	2	3	4	5
Pain and symptom management specialist	1	2	3	4	5
Hospitalist for inpatient care	1	2	3	4	5
Social worker/counselor	1	2	3	4	5

17. Are your patients who are at end-of-life and are no longer in active treatment of their cancer likely to also utilize any of the following providers?

	Never	Rarely	Sometimes	Usually	Always
Palliative care specialist	1	2	3	4	5
Hospice	1	2	3	4	5

D. PRACTICE CONCERNS AND SATISFACTION

18. On a scale of 1 to 5 (1=No Concern and 5=Great Concern), how would you rate your concern with each of the following?

	No Concern	Some Concern	Great Concern		
Increased pressure to see more patients	1	2	3	4	5
Effort needed to keep up with clinical advances and changes in oncology	1	2	3	4	5
Medical liability and malpractice issues	1	2	3	4	5
Insurance coverage restrictions	1	2	3	4	5
Insufficient reimbursement rates	1	2	3	4	5
On-call responsibilities	1	2	3	4	5
Number of uninsured and/or underinsured patients in my practice	1	2	3	4	5
Time spent on documentation and other paper work	1	2	3	4	5
Practice management responsibilities	1	2	3	4	5
Financial security for retirement	1	2	3	4	5
Emotional toll of caring for cancer patients	1	2	3	4	5
Personal health issues	1	2	3	4	5

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19. On a scale of 1 to 5 (1=No Concern and 5=Great Concern), how would you rate each of the following workforce concerns:

	No Concern	Some Concern	Great Concern		
Ability to recruit and retain oncologists	1	2	3	4	5
Ability to recruit and retain NPs/PAs	1	2	3	4	5
Ability to recruit and retain chemotherapy nurses	1	2	3	4	5

20. Please rate your satisfaction with the following items using a scale of 1-5 (1=Very Dissatisfied and 5=Very Satisfied):

	Very Dissatisfied	Neither	Very Satisfied		
Time you have available for your family and personal life	1	2	3	4	5
Opportunities to build trusting relationships with patients and their families	1	2	3	4	5
Opportunities to teach residents and fellows	1	2	3	4	5
Your practice income	1	2	3	4	5
Staffing resources available	1	2	3	4	5
Volume of your patient load/panel size	1	2	3	4	5
Amount of time you spend with each patient	1	2	3	4	5
Ability to participate in clinical trials	1	2	3	4	5
Overall satisfaction with your career in medicine	1	2	3	4	5
Overall satisfaction with your current position	1	2	3	4	5

21. How often do you feel any of the following:

	Every Day	A Few Times a Week	Once a Week	A Few Times a Month	Once a Month or Less	A Few Times a Year or Less	Never
I feel burned out from my work	1	2	3	4	5	6	7
I feel exhilarated after working closely with my patients	1	2	3	4	5	6	7
I feel frustrated by my job	1	2	3	4	5	6	7

COMMENTS: Are there any other factors contributing to your job satisfaction and/or feelings of burnout?

continue . . . Page 3

E. PLANS FOR THE FUTURE

22. In the next three years, how do you expect the number of hours per week you will devote to oncology-related patient care to change?

- Increase Decrease N/A
 No change Stop altogether

23. At what age do you expect to stop providing oncology-related patient care altogether? _____ age

F. ONCOLOGY MARKETPLACE

24. The supply of physicians providing clinical oncology services in your community is currently:

- Greater than demand (surplus)
 Balanced with demand
 Less than demand (shortage)

25. Please rate your agreement with the following using a scale of 1-5 (1=Strongly Disagree and 5=Strongly Agree):

	Strongly Disagree	Neutral	Strongly Agree
It is difficult to recruit clinical oncologists in my community	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I am concerned about a future oncology workforce shortage	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

26. What is the potential of each of the following for meeting a future increase in demand for cancer care services without compromising the quality of care provided?

	No Potential	Some Potential	Significant Potential
Train more clinical oncologists	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Increased use of NPs/PAs	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Increased use of oncology nurses and clinical nurse specialists	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Increased use of social workers, counselors, and patient educators	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Increased use of pain and symptom management specialists	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Increased use of hospice and palliative care providers	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Increased use of primary care providers to care for patients in remission	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Increased use of hospitalists	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Reduction of paperwork and regulations	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Improved information technology such as electronic medical records	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Create incentives for currently practicing oncologists to delay retirement	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Other(1) _____	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Other(2) _____	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

G. DEMOGRAPHIC CHARACTERISTICS

27. Year of birth: **19** _____

28. Hispanic Origin:

- Non-Hispanic Puerto Rican
 Cuban Other, specify: _____
 Mexican/Mexican American

29. Race/Ethnic Background: *(Mark all that apply.)*

- Native American/Alaskan Asian
 Native Hawaiian or Other Pacific Islander Black/African American
 Indian Subcontinent White

30. Gender: Female Male

H. EDUCATION AND TRAINING

31a. Medical Degree: M.D. D.O.

31b. Location of Medical School:

- United States Canada
 Other Country, specify: _____

32. Do you have any other graduate degrees?

- PhD MPH MBA JD Other

33. What year did you complete your oncology fellowship training: _____ N/A

34. Board Certifications: *(Please mark all that apply.)*

- Medical Oncology Internal Medicine
 Hematology Pediatrics
 Pediatric Hematology/Oncology Ob/Gyn
 Gynecologic Oncology Palliative Care

COMMENTS: Please provide any additional comments or observations you may have about the ONCOLOGY workforce, the job market for physicians providing clinical oncology services and/or your professional satisfaction:

THANK YOU FOR TAKING THE TIME TO HELP IN THIS STUDY!

Please return the completed questionnaire in the enclosed business reply envelope to:
 Center for Health Workforce Studies
 School of Public Health, University at Albany
 One University Place, Room B-334
 Rensselaer, NY 12144-3456

If you have questions about the questionnaire or the study, please call the AAMC Center for Workforce Studies at 202-828-0587 or email workforce@aamc.org



SERIAL #

Survey of Oncology Fellows Entering Training in 2006

SURVEY OF ONCOLOGY FELLOWS ENTERING TRAINING IN 2006

The American Society of Clinical Oncology
and

Center for Workforce Studies

Association of American Medical Colleges

This survey is designed to obtain information from physicians entering training in medical oncology, hematology/ oncology, pediatric hematology/oncology, or gynecologic oncology in 2006 regarding why they selected oncology and their future practice plans. Participation in this survey is completely **voluntary**. Individual responses will be kept strictly **confidential**; survey results will be reported only in aggregate.

A. SELECTING YOUR FELLOWSHIP

1. Please indicate the type of fellowship training you will be entering. (*Check one*)
 - Medical Oncology
 - Hematology/Oncology
 - Pediatric Hematology/Oncology
 - Gynecologic Oncology
 - Geriatric Oncology
 - Other (end here)
2. When did you decide you wanted to pursue oncology as a specialty?
 - Before medical school
 - During medical school
 - During residency
 - After practicing in a different area of medicine
3. Did you participate in an oncology rotation during your residency?
 - Yes, it was a program requirement
 - Yes, it was an optional rotation
 - No, I did not participate in an oncology rotation
4. Did you seriously consider pursuing a career in another area of medicine before you decided on oncology?
 - No, I did not seriously consider any other specialties
 - Yes, was also considering other specialty(ies) (specify _____)
 - Yes, was also considering staying in general practice (internal medicine, pediatrics, or OB/GYN)
5. Please indicate how important each of the following factors has been in selecting oncology as a specialty.

	Not Important At All	Slightly Important	Very Important	Extremely Important	N/A
Interest in Specialty					
Medical content of specialty	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Intellectual challenges of specialty	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Recent therapeutic gains and scientific progress	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Rapid translation of scientific discovery into therapies	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Ability to impact outcomes for patients with life-threatening illnesses	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Prestige of specialty	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Influence of Mentors and Friends					
Influence of physician family member/friend	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Influence of mentor/teacher/role model	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Rotation experience	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Personal/family member/friend's experience with cancer	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Career Opportunities					
Academic employment opportunities	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Private practice opportunities	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Opportunity to do both patient care and research	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Opportunity to conduct clinical trials	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Teaching opportunities	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Income potential	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Worklife					
Flexible work schedule opportunities	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Ability to balance personal/professional life	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Opportunity to build trusting relationships with patients	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Other: _____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

6. Were any of the following of concern when you were making your decision to pursue a career in oncology?

	Not a Concern	Slight Concern	Moderate Concern	Significant Concern
Dealing with death and dying	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Communicating with patients and family members	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Difficult ethical/end-of-life decisions	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Limited treatment options	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Stress of an oncology practice	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Work schedule and/or on call duties	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Helping patients decide about participating in clinical trials	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Amount of education-related debt	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

7. How would you rate your current skill level in the following areas?

	Poor	Fair	Good	Very Good	Excellent
Communicating with patients and family members	<input type="radio"/>				
Ethical decision-making	<input type="radio"/>				
Pain management	<input type="radio"/>				
Talking about death and dying	<input type="radio"/>				
Palliative care	<input type="radio"/>				
Ability to effectively communicate with patients from other cultures	<input type="radio"/>				

8. Are you able to communicate effectively in any other languages besides English? (Please list:)

9. How many fellowship programs did you apply to for the 2006-07 academic year?

_____ oncology fellowship programs

_____ other fellowship programs

10. Please rate the importance of the following factors when selecting your oncology fellowship program.

Factors	Level of Importance			
	Not Important At All	Slightly Important	Very Important	Extremely Important
Program location	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Program status/prestige	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Research opportunities	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Diversity of patient population	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Opportunity to work with a particular faculty member

Presence of a Cancer Care Center

B. PERSPECTIVE ON POST-TRAINING PRACTICE

11. What is your assessment of the *job opportunities* in your oncology specialty?

	No positions		Some positions		Many positions	Don't know
	1	2	3	4	5	
Within 50 miles of your training site(s)	<input type="radio"/>					
Nationally	<input type="radio"/>					

12. How many hours per week would you **like** to work in professional medical related activities (patient care, research, and/or teaching) after you complete your fellowship training? ____ hours/week

13. What do you consider to be the ideal mix in terms of the percent of time you would spend in the following medical activities during your first few years of practice?

Direct Patient Care _____

Research _____

Teaching _____

Other (specify _____) _____

Total 100%

14. After completing your fellowship, which primary professional setting are you most likely to choose:

- Academic Medicine
- Private Practice
- Industry
- Government
- Other (specify) _____
- Don't know

15. What type of research would you like to be involved in after completion of your fellowship? (*Check all that apply*)

- Clinical trials (protocol development/management)
- Clinical trials (participation)
- Bench Research
- Translational Research
- Health services/outcomes research
- Other, specify: _____
- None

16. How much do you **expect to earn** during your first year of practice after completing your fellowship training (all sources)?

- Less than \$100,000
- \$100,000 - \$149,999
- \$150,000 - \$199,999
- \$200,000 - \$249,999
- \$250,000 – \$299,000
- Over \$300,000
- Don't know

17. Where did you seek out information when deciding about pursuing an oncology career? (check all that apply)

- Mentor in my residency program
- Spoke with oncology fellowship program director
- Spoke with practicing oncologist(s)
- Spoke with oncology fellow(s)
- Read articles on oncology practice
- Read information on oncology fellowship program websites
- Other _____

17a. Which source(s) provided the most valuable information/insight about a career in oncology?

C. MEDICAL SCHOOL EDUCATION AND TRAINING

18. Please indicate the type of medical school attended:

- US Allopathic Medical School (MD)
- US Osteopathic Medical School (DO)
- Canadian Medical School
- Other International (please specify country)

19. Year of medical school graduation: _____
20. What is the zipcode of your current residency program? _____(if zip not available, please provide state or Province)
21. Total years of residency/fellowship training completed as of July 2006: _____ years
22. Other graduate degree(s) that you hold (*Check all that apply*):
- PhD DPH Other Doctorate JD
 - OMBA OMPH MSW Other Master's degree
23. What is your current level of education related debt?
- I don't have any debt
 - Less than \$25,000
 - Between \$25,000 and \$49,999
 - Between \$50,000 and \$74,999
 - Between \$75,000 and \$99,999
 - Between \$110,000 and \$144,999
 - Between \$150,000 and \$199,999
 - \$200,000 or more

C. DEMOGRAPHIC INFORMATION

24. Gender:
- Female
 - Male
25. Year of Birth: 19__
26. Current Citizenship Status:
- Native Born U.S. Citizen
 - Naturalized U.S. Citizen
 - Permanent Resident
 - H-1, H-2, H-3 Temporary Worker
 - J-1, J-2 Exchange Visitor
 - Other, specify: _____
27. Hispanic Origin:
- Non-Hispanic
 - Cuban
 - Mexican, Mexican American
 - Puerto Rican
 - Other, specify: _____
28. Race (check all that apply):
- Native American/Alaskan
 - Native Hawaiian or Other Pacific Islander

- Indian Subcontinent
- Asian
- Black/African American
- White

E. COMMENTS

What are the Pros/Cons of a career in oncology?

THANK YOU FOR TAKING THE TIME TO HELP IN THIS STUDY!

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