

An Analysis of Recent Growth of Ambulatory Surgical Centers

Final Report

Prepared By:

Lane Koenig, PhD
Julia Doherty, MHSA
Jennifer Dreyfus, MBA
Judy Xanthopoulos, PhD

Prepared For:

ASC Coalition

June 5, 2009



answering today's health policy questions

Table of Contents

About the Authors	i
Executive Summary	ii
I. Purpose of Study	1
II. Growth of the Number of Ambulatory Surgical Centers: An Introduction to the Issues.....	1
a. Characteristics of the ASC Industry	1
b. Policy Issues around Ambulatory Surgical Centers	7
III. Conceptual Model and Methods	8
a. Literature Review.....	9
b. Expert Interviews.....	9
c. Quantitative Analyses	10
IV. ASC Growth Factors: Findings from a Literature Review & Expert Interviews.....	11
a. Factors Affecting Overall Use of Healthcare Procedures	11
b. Factors Affecting the Migration of Services from Inpatient to Outpatient Settings	17
c. Factors Affecting the Ambulatory Surgery Site of Service.....	18
V. Medicare ASC Services: Which Types of Services Have Driven Growth?	21
a. Colonoscopy and Upper GI Endoscopy	25
b. Cataract and Other Eye Surgeries.....	28
c. Pain Management.....	30
VI. Impact of Changes in Service Volume, Comparative Value, Price, and Shift in Site of Care on ASC Growth	32
VII. The Role of Demographics, Provider Supply, and Technological Change.....	35
VIII. Discussion	42
References	44
Detailed Methods Appendix	49
Appendix Charts: Results by Specialty	55

List of Tables

Table 1. ASC Medicare Market Share by Specialty (Based on Allowed Services)	6
Table 2. Contribution to Growth in Medicare Allowed ASC Charges by Service Category	25
Table 3. Prevalence of Cataracts among Adults 40 Years and Older in the United States	29
Table 4. Percent of Growth in ASC Services due to Shift in Site of Service for Select Service Groups and Time Periods.....	34
Table 5. Trends in Growth of ASCs and State-level Characteristics.....	37
Table 6. Estimated Effects of ASCs, Provider Supply, and State Characteristics on Total Medicare Services per 1,000 Beneficiaries by BETOS	38
Table 7. Estimated Effects of ASCs, Provider Supply, and State Characteristics on Total Medicare Services per 1,000 Beneficiaries by Specialty	39
Table 8. Estimated Effects of ASCs, Provider Supply, and State Characteristics on ASC Market Share by BETOS	40
Table 9. Estimated Effects of ASCs, Provider Supply, and State Characteristics on ASC Market Share by Specialty	41

List of Figures

Figure 1. Percent of Outpatient Surgeries by Facility Type	2
Figure 2. Percent of ASCs by Specialty	3
Figure 3. Annual Net Growth Rate in Medicare-Certified ASC Facilities	4
Figure 4. Percent Growth in Medicare Allowed Charges and Allowed Services for ASCs.....	5
Figure 5. Share of Medicare ASC Allowed Charges by Specialty	5
Figure 6. Conceptual Model: the Growing use of ASCs and Place of Service Determination.....	9
Figure 7. General Population Estimates as a Percent of Total Population, Distributed by Gender and Selected Age Groups, July 1, 2007	12
Figure 8. Self-Reported Health Status, 1998 and 2008	14
Figure 9 Percent of US Population with Selected Health Conditions, Selected Years	14
Figure 10. Percent of Persons in the United States Overweight or Obese, Selected Years	15
Figure 11. ASC Share of Medicare Allowed Charges by Type of Service, 2007	22
Figure 12. Average Annual Growth per Capita in Medicare Allowed ASC Services.....	23
Figure 13. Contribution to Growth in Medicare Allowed Charges by Type of Service, 2000 to 2007	24
Figure 14. Average Annual Change in Total ASC Medicare Charges, Population, Number of Allowed Services, Average Relative Weights and Price for Select Years	33
Figure 15. Percent of Growth in ASC Services due to Shift in Site of Service by Selected Category .	34

About the Authors

Lane Koenig, Ph.D., President of KNG Health Consulting, LLC, is a healthcare economist with experience in the public and private sectors. He specializes in conducting data-driven analyses to study a broad range of healthcare issues, including Medicare reimbursement policy, provider efficiency, healthcare spending growth, and the costs and benefits of medical interventions. Prior to starting KNG Health, Dr. Koenig was a chief economist in the Office of Policy at the Centers for Medicare and Medicaid Services (CMS) and a Senior Scientist at The Lewin Group. He graduated with Honors from the University of Florida, Gainesville and earned his Ph.D. in Economics from the University of Maryland, College Park.

Julia Doherty, MHSA, is the Senior Research Director at L&M Policy Research, a woman/minority owned small business dedicated to research on the health issues of underserved populations. Ms. Doherty has 24 years experience in healthcare management, policy and research. With 19 years in the American healthcare system, she has held executive posts in a health maintenance organization, major academic hospital, community health center and management consulting firm. She has published in multiple American and European journals.

Jennifer Dreyfus, MBA, is the principal and founder of Competitive Health Strategies, LLC. For the past 10 years, Ms. Dreyfus has worked with ambulatory surgical centers, professional associations, large physician groups and other providers as she reviews Medicare regulations and assesses the impact of regulatory changes on providers. She also negotiates managed care agreements on behalf of her clients, given her strong financial background and her understanding of the payer and provider communities. Her 25 years of experience in healthcare has led to a strong foundation in payer, physician, hospital and ancillary provider issues. Prior to establishing Competitive Health Strategies, LLC, Ms. Dreyfus held management positions in two managed care organizations, a hospital, and a multi-hospital system. Ms. Dreyfus was a Kaiser fellow and earned her MBA from The Wharton School.

Judy Xanthopoulos, Ph.D., is a principal in Quantria Strategies, LLC where she works developing micro simulation models for tax and pension policy analysis. Prior to founding her own businesses, she spent nearly 10 years with the Joint Committee on Taxation of the U.S. Congress as an economist analyzing tax policy and legislative proposals, with particular emphasis on healthcare and employer pension plan issues. In addition, she has approximately 5 years combined experience working for the National Center for Health Services Research and MedPAC. She earned a PhD in economics from the University of Maryland, College Park.

KNG Health Consulting, LLC (KNG Health) is a health economics and policy firm specializing in objective and data-driven analyses that address real-world challenges. KNG Health contributes to improving the efficiency and effectiveness of healthcare by applying economic concepts and rigorous analytic techniques to understand healthcare markets. The company provides a broad array of consulting services to health provider and insurer associations, health plans, and Federal and State governments.

Executive Summary

This study assesses the factors that have contributed to growth in the number of ambulatory surgical centers (ASCs). ASCs are facilities that provide surgical procedures exclusively on an outpatient basis. ASCs and other ambulatory settings, which include hospital outpatient departments (HOPDs) and physician offices, offer alternative sites of service for certain surgical procedures that do not require an overnight stay.

Conceptual Model and Approach

The potential causes of growth in ASCs are numerous and may include changes in population demographics, disease prevalence, new surgical techniques, Medicare and other payer coverage and reimbursement decisions, and differences in reimbursement levels for ambulatory surgery across care settings. Because of the complexity of the issue, we developed a conceptual model to guide our analysis.

Our conceptual model recognizes three levels of factors that determine the volume of surgical procedures provided by ASCs.

- Level 1: Relates to the overall need for healthcare procedures, including both inpatient and outpatient care, and includes factors that are largely related to characteristics of the population or changes in diagnostic screening recommendations. However, technological change, including new surgical and diagnostic techniques, is also a significant contributor to overall use of surgical procedures.
- Level 2: Relates to whether a procedure is performed on an inpatient basis or done in an outpatient setting. This level is concerned primarily with technologically-driven substitution as a result of improvement in surgical techniques and anesthesia.
- Level 3: Relates to site-of-service decisions. This level addresses how providers and patients select one site of service over another.

Guided by this conceptual model, our technical approach includes both qualitative and quantitative methods. We first conducted a literature search of PubMed for studies published in the last 10 years for each of the three levels of ASC-use determination. In addition, the project team conducted interviews with five experts and stakeholders in the ambulatory surgery community. The purpose of these interviews was to enhance our understanding of the growth factors associated with ambulatory surgery, the changing healthcare and ambulatory environment, and private payment trends.

We conducted a number of quantitative analyses to assess the factors responsible for the growth in services provided in ASCs. These analyses relied on Medicare data and primarily included: a decomposition of Medicare spending, an analysis of shift in site of ambulatory surgery, and regression modeling.

Our decomposition analysis determines the share of growth in total Medicare ASC spending attributable to changes in:

1. Medicare fee-for-service (FFS) population;
2. Average number of services (NOS) per beneficiary;
3. Average relative weights (or comparative value); and
4. Medicare reimbursement levels.

To complete the analysis of a shift in ambulatory surgical setting, we determined what ASC service volume would have been had it grown at the same rate across all ambulatory surgical settings. We then compared the actual growth to this “expected” growth rate. We attributed any ASC volume growth above the “expected” growth to a shift in setting (from HOPDs and physician offices).

Finally, we used regression modeling to test the induced-demand hypothesis and quantify the contribution of specific demand and supply factors to ASC growth. The regression models assessed the impact of ASCs on the total provision of services across ambulatory settings and identified the factors that drive ASC market share.

These three quantitative approaches complement each other. The decomposition of growth and site-of-service analyses allow for statements about the contributions several broad factors make to ASC growth, including population growth, changes in the number of services per beneficiary, and shifts in site of service. The regression models allow us to test whether we can rule out induced demand as a significant growth factor.

Growth of Ambulatory Surgical Centers: An Introduction to the Issues

The number of Medicare-certified ASCs grew at an average annual rate of 7.3 percent from 2000 through 2007, with Medicare payments to ASCs increasing by an average of 11.4 percent per year over this period (MedPAC, 2008). By contrast, Medicare spending for hospital outpatient services grew, on average, by 6.9 percent annually over the same time period (MedPAC, 2008). As a result of the relatively rapid growth of ASCs, some policymakers have raised concerns about the potential overuse of ASCs. Because the factors influencing ASC growth are not well understood, the extent to which the increase in ASC use reflects an appropriate response to patient needs and an efficient allocation of healthcare resources is unclear.

The increased use of ASCs could benefit patients and providers. According to MedPAC, ASCs may offer more convenient locations, shorter waiting times, and easier scheduling for patients (MedPAC 2009). Beneficiary coinsurance amounts are lower for services provided in ASCs as compared to HOPDs as are Medicare program payments for services. A review of the literature by Chukmaitov et al. suggests that the specialized, “focused factory” characteristics of many ASCs could improve patient outcomes (Chukmaitov, et. al., 2004); additional studies in this review of other settings confirm a relationship between procedural volume and quality. Finally, the ASC setting gives patients access to the most recent technological advances (ibid).

Moving volume to ASCs from HOPDs could result in savings to the Medicare program. Medicare’s payments to ASCs were at 86.5 of HOPD in 2003. Several subsequent policy changes lowered ASCs payments even further relative to the HOPD. The Deficit Reduction Act of 2005 (DRA) limited Medicare ASC reimbursement rates to the lesser of the standard ASC rate or the rate under the hospital outpatient prospective payment system. Less than 11 percent of ASC-eligible services were affected by this policy. These affected services represented 7 percent of the ASC surgical volume in

2007, indicating that most ASC services were already being paid at or below the HOPD Medicare rate (MedPAC 2009).

In 2008, the Centers for Medicare and Medicaid Services revised its Medicare payment system for ASCs. The new system reduced payments for many high volume ASC services while increasing payments for other ASC services. CMS also changed the criteria for determining which procedures Medicare would cover in the ASC setting, based upon a MedPAC recommendation. This change resulted in about 800 more procedures being covered in ASCs.¹ According to MedPAC, the new payment system and other changes are expected to result in ASCs receiving an average 59 percent of HOPD payment rates in 2009, a significant reduction from the 86.5 percent in 2003.

Because ASCs offer a lower-cost alternative to HOPDs for surgical services, it is possible that growth in ASC use has slowed the growth in Medicare spending. MedPAC and others point to two factors, however, that may offset the cost-reducing effects of ASCs. First, 91 percent of ASCs have at least one physician owner (ASC Association 2008). Some policymakers are concerned that physician ownership of ASCs could provide a financial incentive for physicians to perform more surgical services than they would if they could provide outpatient surgical services only in an HOPD (i.e., “induced demand”). Second, growth in ASCs expands the overall capacity for outpatient surgery, which could lead to a higher overall volume of surgery.

Evidence points to a number of possible reasons why surgical volume may increase with access to ASCs, unrelated to physician ownership. Evidence indicates that physicians prefer ASCs to HOPDs, because ASCs offer physicians better control over their work environment: surgeries are not “bumped” due to demands from the hospital while short turnaround times and specialized focus by nurses and other support staff at ASCs increase the efficiency of the surgeon (Haugh, 2006; AHA, 2006). In addition, ASCs may offer patients more convenient locations, ease in scheduling surgeries, shorter waiting times, and overall higher patient satisfaction with their experience (MedPAC 2009). Consequently, more access to ASCs may increase the demand for surgical services and cancer screening. These factors could contribute to an observation that the number of ASCs is associated with higher surgical volumes. Regression modeling is used to test the hypothesis that ASCs increase overall surgical volumes.

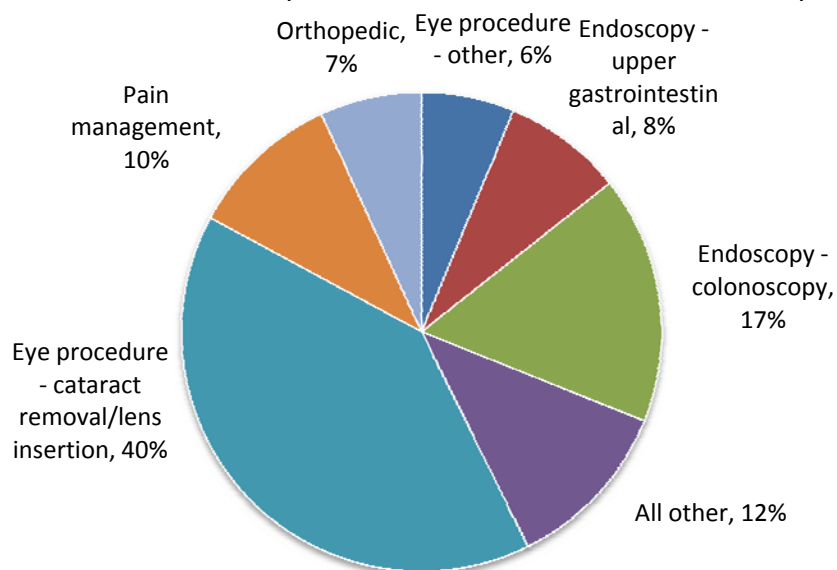
Findings

In 2007, Medicare payments to ASCs totaled approximately \$2.8 billion or \$88 per Medicare beneficiary. The distribution of Medicare ASC payments by service category in 2007 is presented in Figure ES1 below. Forty-six percent of Medicare payments to ASCs were for eye procedures, with most of that for cataract removal/lens insertion procedures (40 percent). Colonoscopy and upper GI procedures accounted for 25 percent of Medicare ASC payments in 2007. Cataract removal and colonoscopies, two services essential to the Medicare population, accounted for 57 percent of total Medicare payments to ASCs. In 2007, Medicare ASC spending for pain management and orthopedic services were 10 and 7 percent, respectively.

¹ It should be noted that this report does not reflect changes in use of ASCs as a result of the 2008 changes as the most recent ASC data are from 2007 and this system did not begin until 2008 and will not be fully phased in until 2011.

Figure ES1. ASC Share of Medicare Allowed Charges by Service Category, 2007

Source: KNG Health analysis of PSPS files. Includes FFS Medicare claims only.



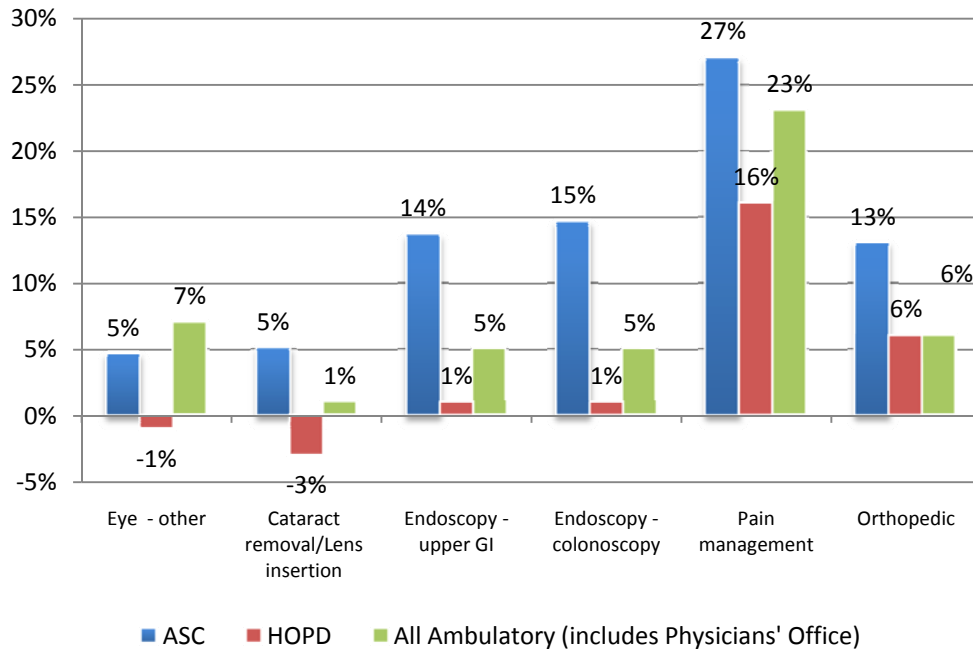
On a per Medicare beneficiary basis, Medicare ASC spending grew at an average annual rate of 9.7 percent between 2000 and 2007, with allowed services² growing by 13.3 percent annually. The growth in Medicare spending for ASCs slowed between 2002 and 2007, from a high of 14 percent to a low of 5 percent in 2007. The moderating growth of Medicare payments to ASCs reflects, in large part, low-reimbursed services, such as colonoscopies, becoming a greater share of total ASC services.

Accounting for the growth in Medicare ASC spending

In Figure ES2, we show the average annual growth per capita in Medicare allowed services for select types of service from 2000 to 2007. Although eye procedures represent the largest share of Medicare spending for ASCs, these services experienced the slowest growth since 2000, with eye procedures growing by 5 percent a year in ASCs. Colonoscopy and endoscopic upper GI procedures increased by an average annual rate of 15 and 14 percent, well above the growth rate for these groups of services across all ambulatory settings. Orthopedic services increased by 13 percent per year in ASCs. Pain management services grew the fastest for ASCs and across all ambulatory settings at 27 and 23 percent, respectively.

² In this paper, allowed services refer to services that are allowed for payment purposes under Medicare.

Figure ES2. Average Annual Growth in Medicare Allowed Service per Beneficiary by Place of Service, 2000 to 2007



Source: KNG Health analysis of Medicare PSPS files. Includes FFS Medicare claims only.

Notes: Chart includes mix of BETOS categories (eye procedure - cataract removal/lens insertion (P4B), Endoscopy - colonoscopy (P8D), Endoscopy - upper GI (P8B), Eye procedure - other (P4E)) and specialty (Pain Management Orthopedics). Mapping of procedure codes to specialty provided by the ASC Association.

The rapid growth of pain management services in ASCs and other ambulatory settings may reflect the recent development of techniques (some pain management capabilities are only ten years old) and a growing recognition by providers and Medicare beneficiaries that pain is a treatable condition. In these respects, pain management could be characterized as a relatively new medical service. In contrast, cataract surgeries have been accepted and provided in an inpatient setting since the 1970s and began moving in significant numbers to the outpatient setting in the 1980s. As the base rate of use for a medical service grows, growth rates tend to stabilize. Pain management also differs from procedures such as cataract surgery or colonoscopy because therapeutic protocols often require multiple injection procedures over the course of treatment; thus the number of pain management procedures can be expected to grow more rapidly than procedures involving a single intervention.

We determined the contribution of each service category to overall ASC service volume growth. Two factors determine a service category's contribution to growth: (1) its growth rate; and (2) the share of ASC spending accounted for by the service group. A service's contribution to overall growth increases with its share of total spending and its growth rate. Based on our data analysis, the following observations can be made:

1. Despite its relatively modest growth rate, the category Eye Procedure - Cataract Removal/Lens Insertion accounted for the largest share of Medicare spending growth for ASCs between 2000 and 2007. This finding is a function of the large share of Medicare

ASC spending for these services. Eye procedures (i.e. cataract removal/lens insertion and Eye – Other) accounted for a combined 29 percent of the growth since 2000.

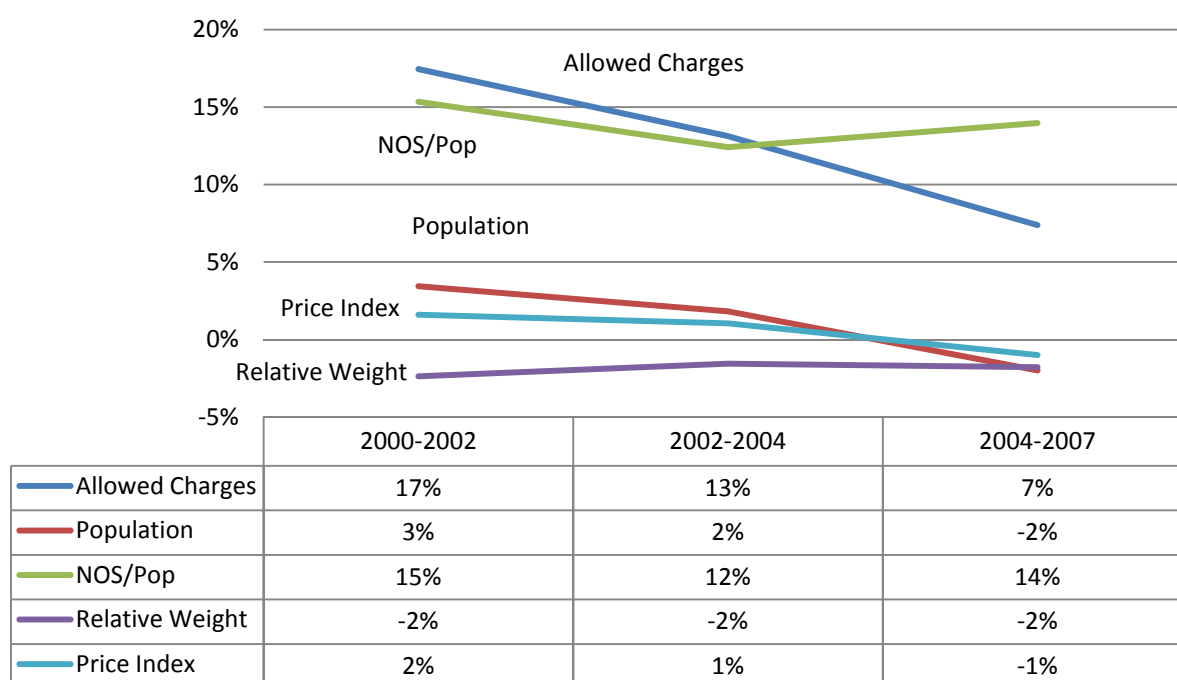
2. Endoscopic procedures represented the next largest contributor to growth. Together, colonoscopy and upper GI endoscopic procedures were the largest drivers of ASC growth, accounting for 32 percent of the total change in Medicare payments.
3. Although they accounted for 10 percent of total Medicare spending for ASCs, pain management services explained 17 percent of the growth in Medicare allowed charges, as a result of their rapid growth over the time period studied.

Changes in Service Volume, Comparative Value, Price, and Site of Service

In Figure ES3, we report findings from our decomposition analysis. This analysis examined the extent to which growth in Medicare population, number of services (NOS) per beneficiary, comparative value, or price changes explain the overall growth in Medicare spending for ASC services. Our measure of comparative value is based on the relative average Medicare payment for a service after holding constant any year-to-year price fluctuations. Changes in price over time are captured in the price index.

Our findings indicate that almost all of the growth in total Medicare spending (allowed charges) for ASC services was due to growth in the number of services per beneficiary. This can be observed by the high growth rates for number of services (NOS) per beneficiary and low rates of growth for all other explanatory factors. Medicare population growth and price changes account for a small but positive amount of the growth. Reductions in average comparative values for ASC services offset some of the growth due to service, population, and price increases. The average Medicare payment for a service fell by around 11 percent between 2000 and 2007, reflecting the growing share of screening services provided by ASCs, which receive relatively low reimbursements as compared to cataract surgery.

Figure ES3. Average Annual Change in Total ASC Medicare Charges, Medicare Population, Number of Allowed Services, Average Relative Weights and Price for Select Years



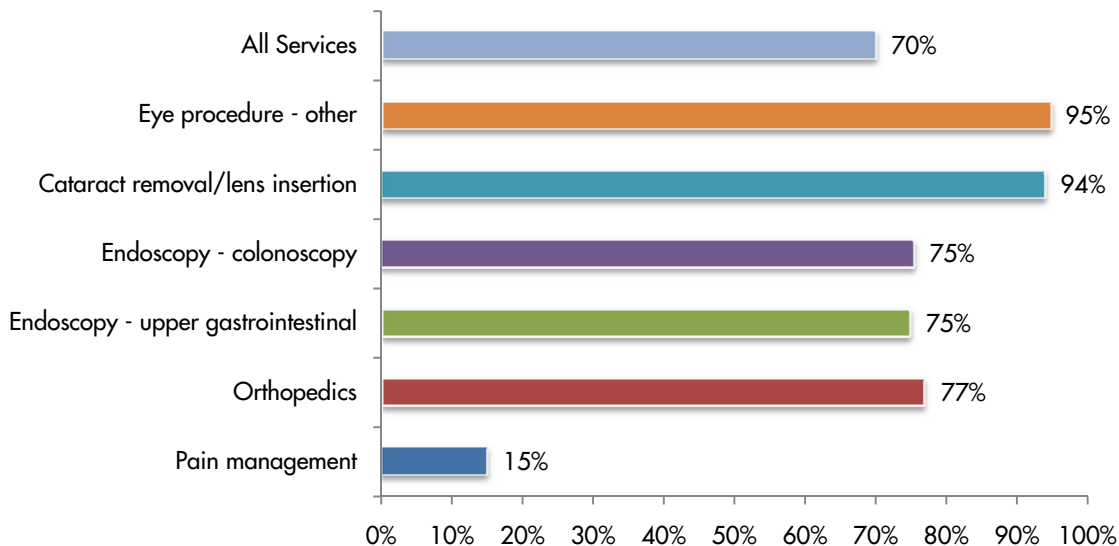
Source: KNG Health analysis of Medicare data. Includes FFS Medicare claims only.

Notes: NOS = Number of services. Population = Medicare FFS beneficiaries. Average relative weight reflects service mix. Decreasing average relative weights indicates that lower reimbursed services are increasing as a share of all services performed in an ASC. The price index reflects year-to-year changes in average Medicare reimbursement rates for ASC payment groups holding constant the mix of services.

Given the role the number of services per beneficiary played in driving growth in Medicare ASC spending, we determined the portion of growth in NOS per beneficiary that was due to care shifting either from (or to) HOPDs or physicians' offices. We estimated that 70 percent of the growth in the total volume of ASC services per beneficiary between 2000 and 2007 can be attributed to increased ASC market share (i.e., services shifting toward ASCs and away from other settings). The remaining 30 percent is due to general growth in ambulatory services. Most of the growth in ASC market share came from HOPDs. For colonoscopy and upper GI services, for example, HOPD share fell from 75 to less than 60 percent between 2000 and 2007, while physicians' offices share remained at 5 percent.

The growth due to shift in site of service showed some variation across types of services. On average, 75 percent of the volume growth in colonoscopy and endoscopic GI procedures was due to a shift in site of service. Ninety-four percent of the growth in cataract and other eye procedures was accounted for by the same shift in site of service from HOPDs to ASCs. By contrast, we estimated that 15 percent of the growth in pain management services was due to site of service changes. This result is consistent with the general pattern of growth observed for pain management procedures across all ambulatory surgical settings, including ASCs.

Figure ES4. Percent of ASC Growth in Allowed Services due to Shift in Site of Service for Select Service Categories, 2000-2007



Source: KNG Health analysis of Medicare PPS files. Includes FFS Medicare claims only.

Notes: Table includes a mix of BETOS categories (eye procedure - cataract removal/lens insertion (P4B), Endoscopy - colonoscopy (P8D), Endoscopy - upper GI (P8B), Eye procedure - other (P4E)) and specialty (Pain Management Orthopedics). Mapping of procedure codes to specialty provided by the ASC Association.

The Role of Demographics, Provider Supply, and Technological Change in ASC Growth

To assess how much issues like provider supply, demographics, and technological advancements may have fueled ASC growth, we estimated state-level regression models using cross-sectional, time-series data. Separate models were developed for each of the top volume service categories. Two specifications were used. First, we examined the effects of state-level provider supply and Medicare population demographics on the total number of services per 1,000 beneficiaries. The dependent variable, total volume of procedures per 1,000 beneficiaries, includes volume for all ambulatory settings. This model tests the induced demand hypothesis by examining whether the number of ASCs is associated with total ambulatory service volume. Second, we estimated a state-level regression model in which the dependent variable was the share of Medicare procedures done in the ASC. This two-step strategy to the regression modeling is consistent with our conceptual model. Each model was estimated using state and year fixed effects and included the following explanatory variables:

- ASCs per 100,000 population
- Short-term general hospitals per 100,000 population
- Office-Based Physicians per 10,000 population
- Number of surgical physicians as a share of total number of physicians
- % Population Age 75 to 84
- % Population Age 85+
- % Population Male
- % Population Hispanic

- % Population African American
- % Population 65+ Reporting Fair or Poor Health
- Medicare Disabled Share
- Median Household Income

After controlling for population demographic factors and provider supply, we generally found no statistically significant relationship between the number of ASCs and total Medicare service volume per beneficiary, with the exception of pain management. Thus, we conclude that induced demand is not an important driver of ASC volume. For pain management, we found that each additional ASC per 100,000 people would increase the number of Medicare pain management services by 26 percent. While we cannot rule out that induced demand may have contributed to the growth in pain management services for ASCs, there are likely other factors involved in the observed growth. These services have grown rapidly across all ambulatory settings and are the subject of public efforts to improve the treatment of pain. We are unable to separately identify any effects associated with physician and patient preference for ASCs. Also, pain management differs from procedures such as cataract surgery or colonoscopy because a patient may require multiple injection procedures over the course of a standard treatment protocol.

In addition, we found that each additional ASC per 100,000 people would increase ASC market share for colonoscopies and upper GI endoscopies by roughly 22 and 30 percent, respectively. Much smaller market share effects from an additional ASC were found for pain management (6%).

Discussion

We conducted a comprehensive study of the growth factors for ASCs. Although our qualitative analyses, including literature review and expert interviews, covered Medicare and non-Medicare populations, we were primarily limited to Medicare data in conducting our quantitative analyses. We highlight the major study findings below.

- Growth in surgeries performed in ASCs parallels the historic shift away from hospital inpatient surgeries toward outpatient settings.
- A number of factors account for the growth in ASCs including population health guidelines for disease screening (e.g., colorectal cancer screening), shift in site of services away from the hospital outpatient setting to ASCs, payer incentives to pay for care in the most cost-effective setting, demographic changes, and consumer and physician preferences.
- Much of the growth in outpatient surgeries was made possible by technological improvements that have allowed for faster patient recovery times. These advances include improved surgical techniques, anesthesia, and pharmaceuticals to better manage post-operative pain.
- Patients may prefer ASCs because they offer lower copayments, more convenient locations, shorter waiting times, and easier scheduling for patients.
- Physicians report preferring to treat patients in an ASC because it provides an opportunity to better control staffing decisions, equipment selection decisions, and process and scheduling

decisions (FASA, 2007). The ability to manage their work environment, along with short turnaround times and specialized focus by nurses and other support staff at ASCs (Haugh, 2006; AHA, 2006) creates the potential for higher professional revenue through increased productivity. Physicians with an ownership interest in the facility may derive a portion of their income through ownership equity.

- Eye procedures represent the largest share of Medicare spending for ASCs, but these services have experienced the slowest growth since 2000. Colonoscopy procedures increased by 15 percent per year, on average.
- Colonoscopy and upper gastrointestinal endoscopic (GI) procedures accounted for almost a third of Medicare ASC spending growth between 2000 and 2007. This finding is consistent with growing demand for essential cancer and other screening services among Medicare beneficiaries.
- Almost all of the growth in Medicare spending for ASC services was due to growth in the number of services per beneficiary. Medicare population growth and price changes account for a small but positive amount of the growth. The average price of procedures performed in the ASC fell by around 11 percent between 2000 and 2007, reflecting the growing share of screening services provided by ASCs.
- We estimate that 70 percent of the growth in ASC service volume per Medicare beneficiary between 2000 and 2007 can be attributed to ASCs capturing market share from HOPDs (also referred to as a shift in site of service). The remaining 30 percent is attributed to overall growth in outpatient surgical services across all settings.
- We find little evidence that induced demand is a driver of ASC service volume. After controlling for population demographic factors and provider supply, we generally find no statistically significant relationship between the number of ASCs and the total Medicare service volume per beneficiary. For pain management, we are not able to reject the hypothesis of induced demand, although physician and consumer preferences along with treatment protocols that require multiple injection procedures for ASCs may contribute to the finding that the number of ASCs is positively correlated with the total volume of pain management services.

The number of ASCs has grown significantly since 2000, along with the number of Medicare services provided in these facilities. We found that most of the growth in Medicare services since 2000 resulted from a movement of services from the HOPD to the ASC. Almost 60 percent of the growth in Medicare spending for ASCs since 2000 was due to growth in cataract surgeries, colonoscopies, and upper gastrointestinal procedures. These procedures are strongly associated with age and represent essential services to Medicare beneficiaries. These findings along with the observation that ASCs have been paid less than HOPDs, on average, suggest that the Medicare program may have spent less as a result of the movement of services to ASCs.

Despite the strong growth over the last several years, increases in the number of Medicare-certified ASCs have slowed recently. Whether this trend will continue is uncertain, but a number of factors point to this possibility. In the short term, the economic environment is likely to discourage the establishment of new ASCs. The transition to a new Medicare payment system is reducing payment

for some high-volume services, while rates are increasing for many low volume services. Although the net effect of these reimbursement changes on ASC growth may be mixed, the large differential between Medicare payments to ASCs and HOPDs may have altered the incentives for development of ASCs. Even more fundamentally, physician supply constraints may limit the growth rates in future years.

I. Purpose of Study

This study assesses the factors that have contributed to growth in ambulatory surgical centers (ASCs). ASCs are facilities that provide surgical procedures exclusively on an outpatient basis. ASCs and other ambulatory settings, which include hospital outpatient departments (HOPDs) and physician offices, offer alternative sites of service for certain surgical procedures that are not expected to require an overnight stay.

The number of Medicare-certified ASCs grew at an average annual rate of 7.3 percent from 2000 through 2007, with Medicare payments to ASCs increasing by an average of 11.4 percent per year over this period (MedPAC, 2008). By comparison, Medicare spending for hospital outpatient services grew, on average, by 6.9 percent annually over the same time period (MedPAC, 2008). As a result of the relatively rapid growth of ASCs, some policymakers have raised concerns about the potential overuse of ASCs. The factors influencing ASC growth, however, are not well understood. Consequently, the extent to which the increase in ASC use reflects an appropriate response to patient needs is unclear.

The ASC Coalition, consisting of ASC associations and companies, engaged KNG Health Consulting, LLC to conduct a comprehensive review of the factors that have led to the growth of ASCs. A better understanding of the factors that have contributed to ASC growth is essential to inform policy discussions. Our empirical analyses focuses primarily on Medicare spending, although we consider factors that encourage the use of ASCs by all patients.

II. Growth of the Number of Ambulatory Surgical Centers: An Introduction to the Issues

To provide context for the rest of the paper, we present background on the growth of ASCs and review some of the policy issues.

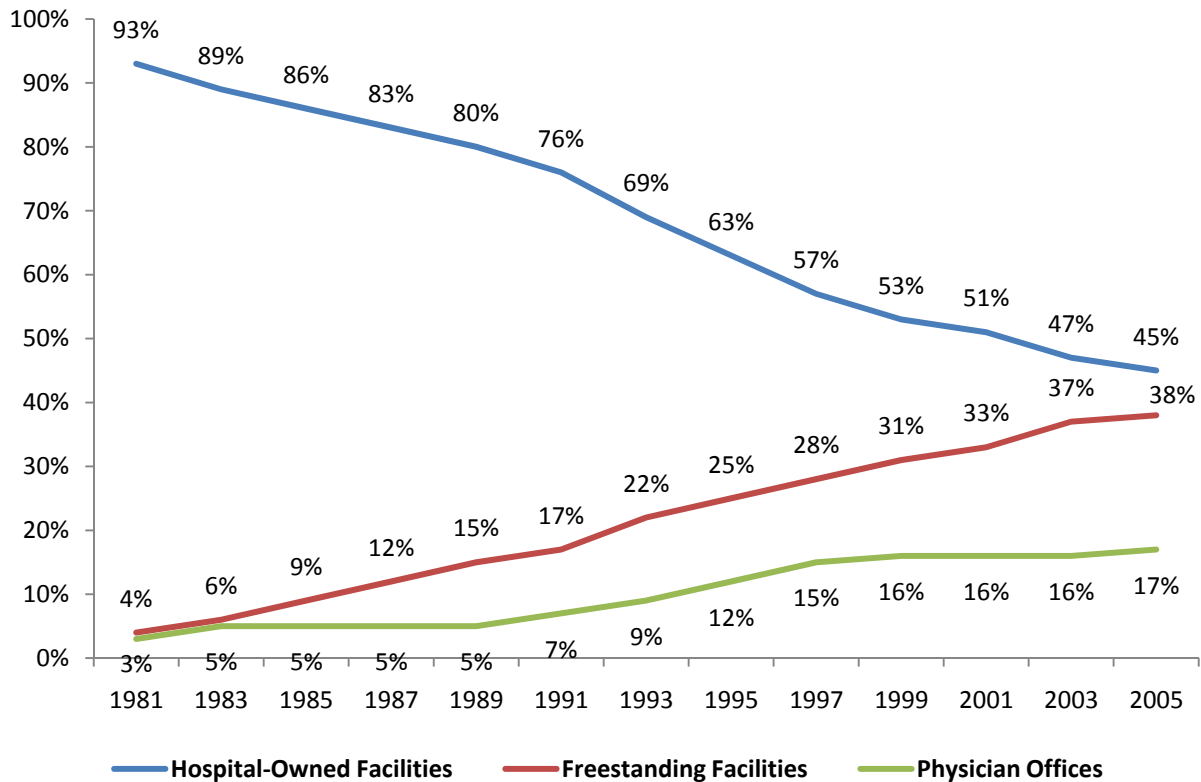
a. Characteristics of the ASC Industry

The first ASCs were established in the early 1970s, with Medicare first offering coverage for ASC services under Part B in 1982. At that time there were only 30 surgical procedures that met government guidelines for coverage. Since the 1980s, the share of surgeries performed in outpatient settings has grown significantly. In 1981, approximately 81 percent of surgeries were performed in hospitals on an inpatient basis. By 1999, inpatient surgeries represented only 37 percent of all surgeries, compared to 63 percent for outpatient surgeries. These shares have remained stable for the past several years.

At the same time, there has been a steady movement of surgery away from hospital outpatient settings toward ASC and physician offices (Figure 1; the labels for this figure come from the data source). Freestanding facilities are primarily ASCs). In 1981, the vast majority (93 percent) of outpatient surgeries were performed in hospital outpatient departments. The share of surgeries performed in HOPDs (or hospital-owned facilities) fell to 45 percent by 2005, with the share of surgeries performed in freestanding facilities increasing almost four-fold.

Figure 1. Percent of Outpatient Surgeries by Facility Type

Source: AHA, Trendwatch Chartbook, 2008, Supplementary Data Tables, Organizational Trends

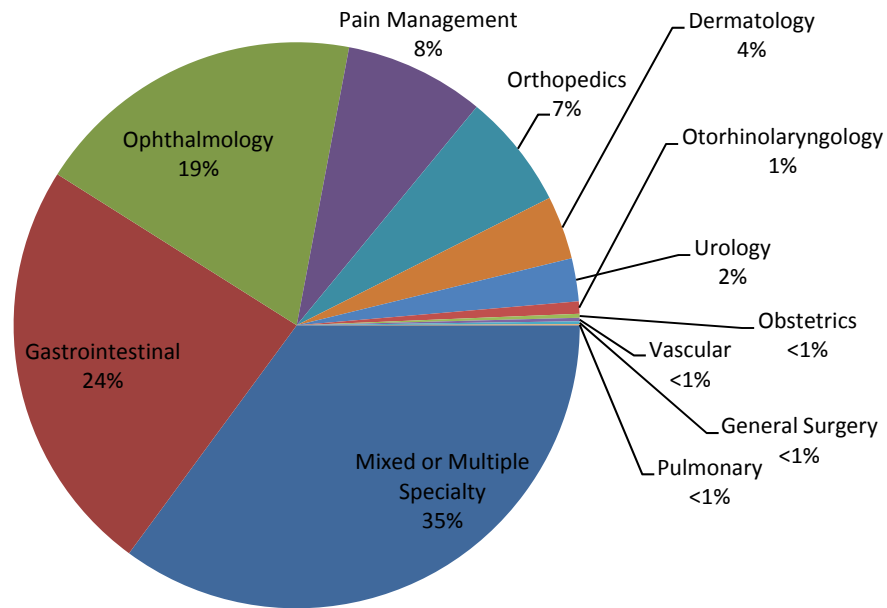


In 2008, there were approximately 5,149 Medicare-certified ASCs in the United States.³ This number has increased steadily over the past ten years. The vast majority of ASCs remain under private ownership. The number of HOPDs, on the other hand, has remained fairly stable over the years, despite an overall increasing trend in the number of outpatient surgeries. There were slightly more than 4,800 HOPDs in 2008. ASCs are concentrated heavily in California, Florida, and Texas, with 694, 387, and 347 facilities in each state in 2008, respectively (See Maps 1 and 2 at the end of the document).

ASCs offer a variety of surgical services (Figure 2). Thirty-five percent of ASCs are multi-specialty providers in that they provide a mix of surgical services. A number of facilities were identified as specializing in either gastrointestinal procedures or ophthalmology.

³ Excluding 23 ASCs located in Puerto Rico and 2 in Guam.

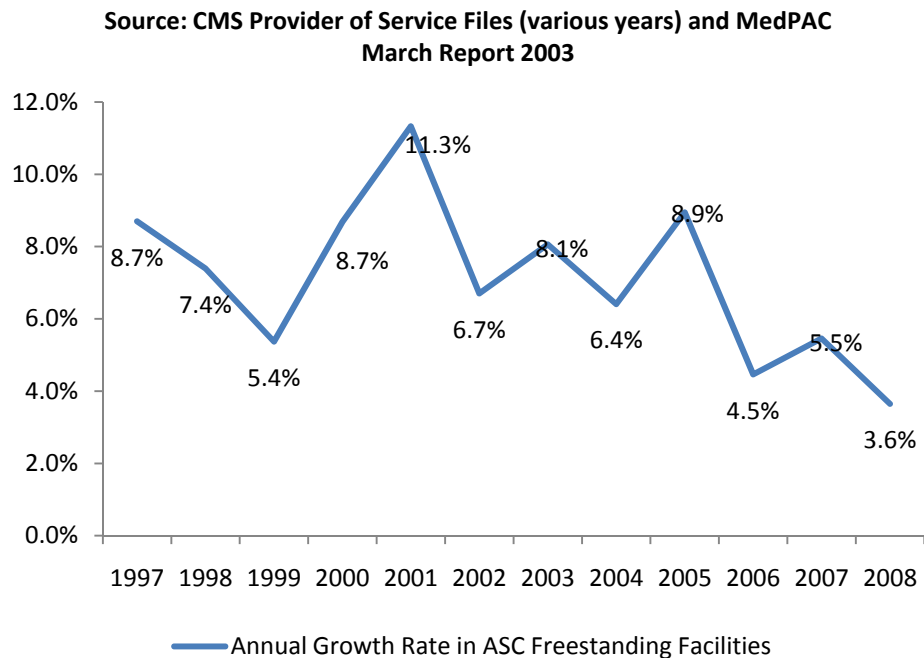
Figure 2. Percent of ASCs by Specialty



Source: 2007 PSPS file.

The number of Medicare-certified ASCs grew at an average annual rate of 7.1 percent from 1997 to 2008 (Figure 3). Since 2000, an average of 341 new Medicare-certified ASCs entered each year, with a net gain of 273 ASCs after accounting for closures and mergers (MedPAC, 2008). Although the growth rate has varied from year to year, the trend since 2001 is downward. In 2001, the ASC growth rate reached its highest point of 11.3 percent (since 2000). In 2008, the number of ASCs grew by 3.6 percent, its lowest rate since 2000.

Figure 3. Annual Net Growth Rate in Medicare-Certified ASC Facilities



Medicare ASC spending per beneficiary grew at an average annual rate of 9.7 percent between 2000 and 2007, with allowed services⁴ growing by 13.3 percent annually (Figure 4). This rate is higher than the growth in Medicare spending for hospital outpatient services, which grew by an average annual rate of 6.9 percent over the same period (Chart 8-6 and 8-13, MedPAC, 2008). Nevertheless, with the exception of 2006, the rate of growth in Medicare spending for ASC services has fallen each year since 2002.

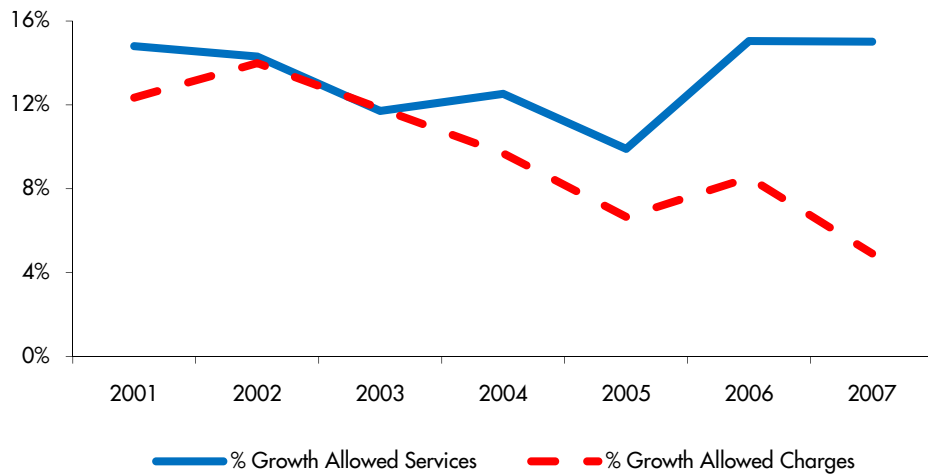
The rate of growth in Medicare spending varied significantly across states, with 16 states having annual growth rates of more than 14 percent (See Map 7 at end of document).

The moderating growth of ASC Medicare payments reflects two factors. First, ASC payment rates under Medicare were frozen from 2003 through 2009. With the transition to the new ASC payment system, rates for individual procedures changed, but these changes were implemented in a budget neutral manner so no overall increase occurred. In addition, payment rates for 11 percent of services (7 percent of service volume) decreased in 2007 as a result of provisions in the Deficit Reduction Act of 2005 (DRA), which limited Medicare payments for ASC services to no more than Medicare payments under the OPPS for the same service. Although not observed in the data analyzed for this report, payments for nearly all of the most common ASC procedures were reduced in 2008 and are scheduled for further reductions through 2011 as the revised payment system is phased in.

⁴ In this paper, allowed services refer to services that are allowed for payment purposes under Medicare.

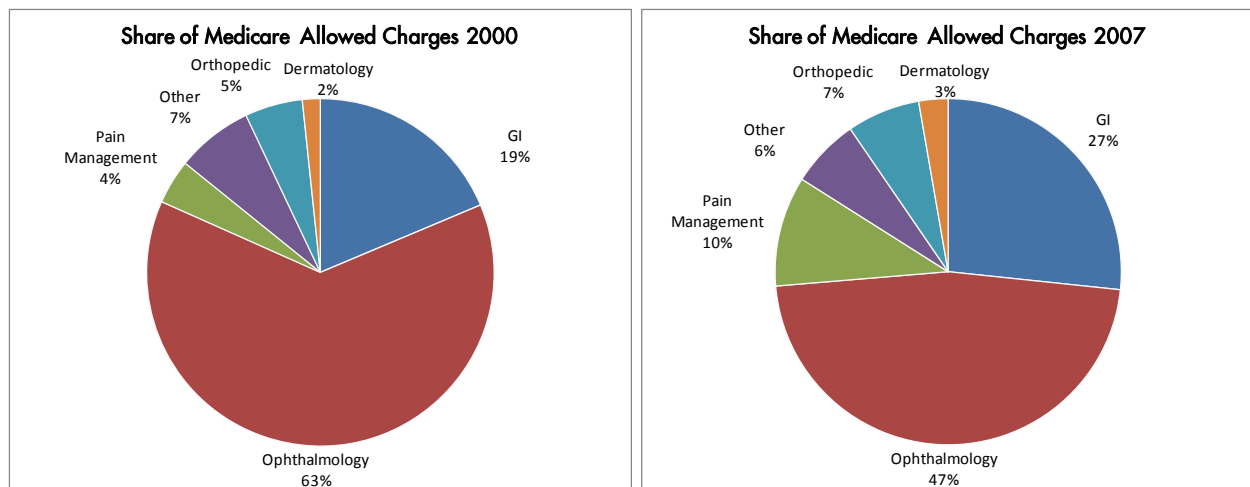
Figure 4. Percent Growth in Medicare Allowed Charges and Allowed Services for ASCs

Source: KNG Health analysis of the PSPS file



Second, and more importantly for the moderating growth in Medicare payments, ASCs are providing more low-reimbursed services to Medicare beneficiaries. For example, ophthalmology services such as cataract surgery, for which ASCs receive a relatively high payment, fell from 63 to 47 percent as a share of total ASC Medicare spending between 2000 and 2007. At the same time, gastrointestinal (GI) services, such as colonoscopy which are paid at a lower rate, increased from 19 to 27 percent (Figure 5).

Figure 5. Share of Medicare ASC Allowed Charges by Specialty



Source: KNG Health analysis of Medicare PSPS file.

Pain management services as a share of total Medicare ASC spending increased by 6 percentage points, growing from 4 to 10 percent of Medicare spending between 2000 and 2007. Medicare spending for orthopedic and dermatological services as a share of total ASC spending increased

only a small amount in absolute percentage terms over this time period, although their relative growth rates were robust.

With respect to Medicare, ASCs have increased their market share for most service types (Table 1). We defined a market as the total number of services provided in either physician's offices, HOPDs, or ASCs. The growth in GI services since 2000 has been the most notable: ASCs provided almost 37 percent of all GI services performed on Medicare beneficiaries in 2007, an increase of 19.4 percentage points from 2000. 2007, ASCs provided roughly 30 percent of ophthalmology and pain management Medicare services.

Most of the growth in ASC market share came from HOPDs. For colonoscopy, for example, HOPD share fell from 73 percent to 54 between 2000 and 2007, while physicians' offices share remained at 5 percent. For pain management, the share of services done in physicians' offices grew from 47 to 52 percent, while the HOPD share fell from 29 to 19 percent. Similar patterns were observed for other service types whereby HOPD shares fell while the share of services done in physicians' offices remained stable or increased.

Based on our review of the characteristics of the ASC industry, we conclude:

1. Growth in the number of Medicare-certified ASCs averaged around 7 to 8 percent since 2000, but the growth has slowed in recent years.
2. Medicare growth in spending for ASCs has also slowed, primarily as a result of a changing mix of services performed at ASCs, tending toward lower reimbursed services.
3. ASCs are capturing greater market share for a number of services, particularly for GI procedures (e.g., colonoscopy).

Table 1. ASC Medicare Market Share by Specialty (Based on Allowed Services)

Specialty	2000 ASC Share	2007 ASC Share	Share Change
Gastrointestinal (GI)	17.3%	36.6%	19.4%
Ophthalmology (OP)	28.2%	30.6%	2.4%
Pain Management (PM)	23.7%	29.2%	5.5%
Orthopedics (OR)	2.6%	3.9%	1.4%
Dermatology (DR)	0.3%	0.6%	0.3%
Other	0.1%	0.4%	0.3%

Source: KNG Health analysis of Medicare PPS file. Mapping of procedure codes to specialty provided by the ASC Association.

b. Policy Issues around Ambulatory Surgical Centers

Although subsequent sections explore the potential reasons for ASC growth, it is worth considering issues and possible implications of the increasing use of ASCs for the Medicare program and its beneficiaries. The increased use of ASCs could benefit patients and the Medicare program. According to MedPAC, ASCs may offer more convenient locations, shorter waiting times, and easier scheduling for patients (MedPAC 2009). Beneficiary coinsurance amounts are lower for services provided in ASCs as compared to HOPDs as are Medicare program payments for services. A review of the literature by Chukmaitov et al. suggests that the specialized, “focused factory” characteristics of many ASCs could improve patient outcomes (Chukmaitov, et. al., 2004); additional studies in this review of other settings confirm a relationship between procedural volume and quality. Finally, the ASC setting gives patients access to the most recent technological advances (ibid).

Moving volume to ASCs from HOPDs could result in savings to the Medicare program. Medicare’s payments to ASCs were at 86.5 of HOPD in 2003. Several subsequent policy changes lowered ASCs payments even further relative to the HOPD. The Deficit Reduction Act of 2005 (DRA) limited Medicare ASC reimbursement rates to the lesser of the standard ASC rate or the rate under the hospital outpatient prospective payment system. Less than 11 percent of ASC-eligible services were affected by this policy. These affected services represented 7 percent of the ASC surgical volume in 2007, indicating that most ASC services were already being paid at or below the HOPD Medicare rate (MedPAC 2009).

In 2008, the Centers for Medicare and Medicaid Services revised its Medicare payment system for ASCs. The new system reduced payments for many high volume ASC services while increasing payments for other ASC services. CMS also changed the criteria for determining which procedures Medicare would cover in the ASC setting, based upon a MedPAC recommendation. This change resulted in about 800 more procedures being covered in ASCs.⁵ According to MedPAC, the new payment system and other changes are expected to result in ASCs receiving an average 59 percent of HOPD payment rates in 2009.

Because ASCs offer a lower-cost alternative to HOPDs for surgical services, it is possible that growth in ASC use has slowed the growth in Medicare spending. MedPAC and others point to two factors, however, that may offset the cost-reducing effects of ASCs. First, 91 percent of ASCs have at least one physician owner (ASC Association 2008). Some policymakers are concerned that physician ownership of ASCs could provide a financial incentive for physicians to perform more surgical services than they would if they could provide outpatient surgical services only in an HOPD (i.e., “induced demand”). Second, growth in ASCs expands the overall capacity for outpatient surgery, which could lead to a higher overall volume of surgery.

Evidence points to a number of possible reasons why surgical volume may increase with access to ASCs, unrelated to physician ownership. Evidence indicates that physicians prefer ASCs to HOPDs, because ASCs offer physicians better control over their work environment: surgeries are not “bumped” due to demands from the hospital while short turnaround times and specialized focus by nurses and other support staff at ASCs increase the efficiency of the surgeon (Haugh, 2006; AHA, 2006; RAND, 2008). In addition, ASCs may offer patients more convenient locations, ease in

⁵ It should be noted that this report does not reflect changes in use of ASCs as a result of the 2008 changes as the most recent ASC data are from 2007 and this system did not begin until 2008 and will not be fully phased in until 2011.

scheduling surgeries, shorter waiting times, and overall higher patient satisfaction with their experience (MedPAC 2009; RAND, 2008). Consequently, more access to ASCs may increase the demand for surgical services and cancer screening. These factors could contribute to an observation that the number of ASCs is associated with higher surgical volumes. Regression modeling is used to test the hypothesis that ASCs increase overall surgical volumes.

We focus on identifying factors behind the growth in services provided in ASCs and attempt to quantify their contribution to growth. The issue of the potential impact of ASCs on overall volume of surgical services is an important one. However, disentangling the effects of any potentially induced demand from other demand (patient preference) and supply (physician preference) factors is difficult. We used regression modeling to attempt to shed some light on the relationship between access to ASCs and surgical volumes.

While we examine the impact of ASCs on Medicare surgical volume and market share in the empirical sections of this paper, some of the issues raised in the literature regarding surgical centers are outside the scope of this study. Specifically, we do not address the issue of the adequacy of Medicare reimbursement for ASCs. In addition, research has examined how the types of patients treated in ASCs differ from those treated in HOPDs in terms of medical complexity (Winter, 2003) and insurance coverage (e.g., Medicaid versus private insurance) (MGMA 2006). These issues are outside the scope of the current study.

III. Conceptual Model and Methods

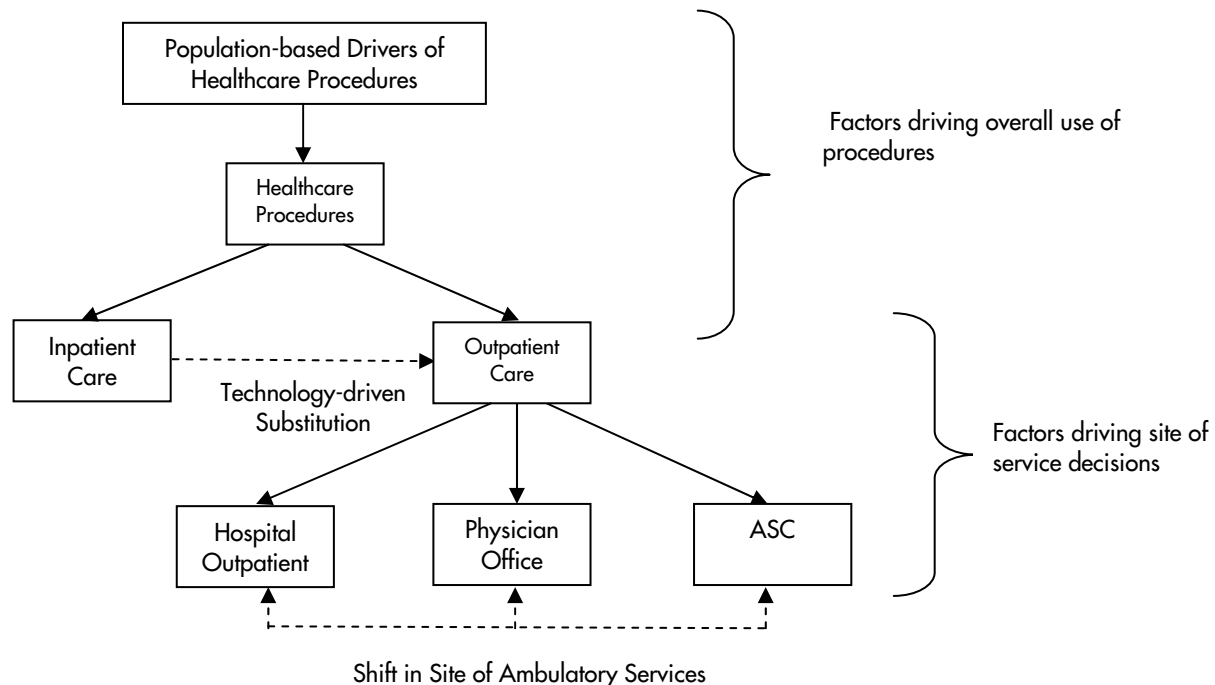
The potential causes of growth in ASCs are numerous and may include changes in population demographics, disease prevalence, new surgical techniques, Medicare and other payer coverage decisions, and differences in reimbursement levels for ambulatory surgery across care settings. Because of the complexity of the issue, a conceptual model is helpful in guiding the analysis and in systematically classifying potential contributors to growth.

Figure 6 presents our conceptual model of ASC growth. This model served as a guide in developing and implementing our technical approach. The model identifies essentially three levels of factors that determine the volume of surgical procedures provided by ASCs. The first level relates to the overall need for healthcare procedures, including both inpatient and outpatient care. The factors that determine the need for healthcare procedures in general are largely related to characteristics of the population, changes in screening protocols, and technological change in the form new surgical and diagnostic techniques. The second level relates to whether a procedure is performed on an inpatient basis or done in an outpatient setting. This level relates primarily to technologically-driven substitution as a result of improvement in surgical techniques and anesthesia, although inpatient capacity may also be an important consideration. The third level relates to site-of-service decisions as to which ambulatory setting the surgical service is to be performed (e.g., HOPD, ASC, or physician office).

Within each level, the factors that determine the use of ASCs can be further categorized into demand-side and supply-side factors. Demand-side factors are those elements that result in the need for healthcare and/or the reasons people seek care. Examples include an aging population, increased disease prevalence, or an increase in screening for specific diseases or conditions. Supply-side factors are those elements that affect the availability of ambulatory surgery and,

specifically, ASCs. Examples of supply-side factors include relative price (reimbursement) changes and insurance coverage of new procedures.

Figure 6. Conceptual Model: the Growing use of ASCs and Place of Service Determination



Guided by our conceptual model, our technical approach included both qualitative and quantitative methods to address the three levels of ASC-use determination.

a. Literature Review

We conducted a literature review to assess the factors affecting overall use of healthcare, the shift from inpatient to outpatient settings, and the issues associated with the decision to provide or obtain services in specific ambulatory care settings. The literature review included a PubMed search as well as Google searches and searches of the Federal Register and key websites related to ambulatory surgery, including the websites of the Centers for Medicare and Medicaid Services, and the MedPAC.⁶

b. Expert Interviews

In addition to performing a literature review, the project team conducted interviews with five experts and stakeholders in the ambulatory surgery community. The purpose of the interviews was to enhance our understanding of the growth factors associated with ambulatory surgery, the changing healthcare and ambulatory environment, and private-payer reimbursement trends.

⁶ The PubMed search was limited to studies published in English during the last 10 years.

We developed an interview protocol, which guided the discussions with the experts. The protocols asked interviewees to identify and rank the most important drivers of ASC use. We then asked interviewees about specific types of services, such as colonoscopy and orthopedic surgery.

c. Quantitative Analyses

We conducted a number of quantitative analyses to assess the factors responsible for the growth in ASC service volume. These analyses relied on Medicare data and included: a decomposition of Medicare spending growth, an analysis of shift in site of ambulatory surgery, and regression modeling.

In reporting our findings on ASC volume, we generally used either Medicare allowed charges or allowed services. Allowed charges are the fee schedule amounts, which include eligible payments to providers from the Medicare program and from beneficiaries. All Medicare data relate to services for Medicare fee-for-service enrollees and exclude claims for Medicare Advantage enrollees.

The primary data source for the quantitative analyses was the Medicare Physician/Supplier Procedure Summary (PSPS) file for the years 2000 through 2007. The PSPS summarizes all Medicare fee-for-service carrier-paid claims for each calendar year, by Healthcare Common Procedure Coding System (HCPCS) code, modifier, carrier and locality, provider specialty and place of service (e.g., physician office, HOPD, ASC) (See the Methods Appendix for a description of the data sources.)

Decomposition of Medicare Growth Factors. Our decomposition approach characterizes Medicare spending as the product of:

1. Number of Medicare beneficiaries;
2. Average number of services (NOS) per beneficiary;
3. Average relative weight (or comparative value); and
4. Price (dollars per payment weight)

The sum of the percentage change in each factor is approximately equal to the percentage change in total Medicare spending. Therefore, we can use this approach to determine what percent of the growth in Medicare spending for ASCs is due to Medicare beneficiary population growth, growth in the number of services per beneficiary, or growth in relative payment weights. Prior to 2008, Medicare did not establish relative weights for ASC services. Instead, the Medicare ASC payment system grouped services into nine payment groups. We developed a relative weight for each service by dividing the payment amount for a service (using the average payment amount from 2000 to 2007) by the overall average payment amount across all services.

Shift in Site of Ambulatory Surgery Model. We assessed the amount of growth in Medicare ASC procedures due to a shift in site of service using the PSPS file. We determined the effects of a shift in site of service on ASC service growth overall and for select groups of services. To implement the approach we estimated the distribution of services across ambulatory settings in a base year and then projected the number of services in following years, assuming the distribution across settings had remained unchanged. Put another way, we allowed ASC services to grow at the same rate observed across all ambulatory settings and then determined the extent to which the actual growth

rate differed from this “expected” growth rate. We attributed any difference between the expected and actual growth rates as the growth due to a shift in site of service. For example, consider a service for which ASCs have 10 percent market share and for which there were 100 units of service provided across all ambulatory settings in a base year. If the number of units in the following year were 120, we would expect ASCs to provide 12 of these (or 10 percent). If ASCs provided more than 12, we would attribute these additional services to a shift from HOPDs or physicians’ offices to ASCs.

State-Level, Time-Series Regression Model. The decomposition of growth and site-of-service analysis allow us to make statements about the contributions to ASC growth for selected broad factors, such as growth in population, number of services per beneficiary, and shifts in site of service. To quantify the contribution of specific demand and supply factors to growth, we used regression analysis. We estimated state-level regression models using cross-sectional, time-series data with state and year fixed effects.

The data source for the Medicare service counts is the PSPS files. The dependent variable, the log of the number of procedures per 1,000 Medicare beneficiaries, is not specific to ASCs but includes volume for all ambulatory surgical settings. Technological change and other temporal changes are captured through a series of time dummy variables. We estimated a second state-level regression model where the dependent variable was the share of Medicare procedures done in the ASC setting. Each equation is estimated for the top groups of services performed in an ASC.

IV. ASC Growth Factors: Findings from a Literature Review & Expert Interviews

The following sections provide background and supporting information on the factors influencing ASC growth. We organize these sections around the three primary categories of growth factors – overall healthcare growth, migration of procedures from inpatient to outpatient settings, and shift in site of ambulatory surgical settings.

a. Factors Affecting Overall Use of Healthcare Procedures

Technological and clinical advances are factors that researchers consistently identify as important drivers of healthcare spending. Most analysts conclude that the majority of long-term increase in spending arises from the use of new medical services that were made possible by technological advances or what some analysts term the “increased capabilities of medicine” (CBO Testimony, 2008; CBO, 2007).

Other factors thought to influence the growth in medical spending include the aging population, personal income increases, changes in insurance, prices in the healthcare sector, and the growing prevalence of obesity (CBO, 2007). These factors, however, appear to explain less than half of the growth in long-term spending for healthcare (CBO Testimony, 2008).

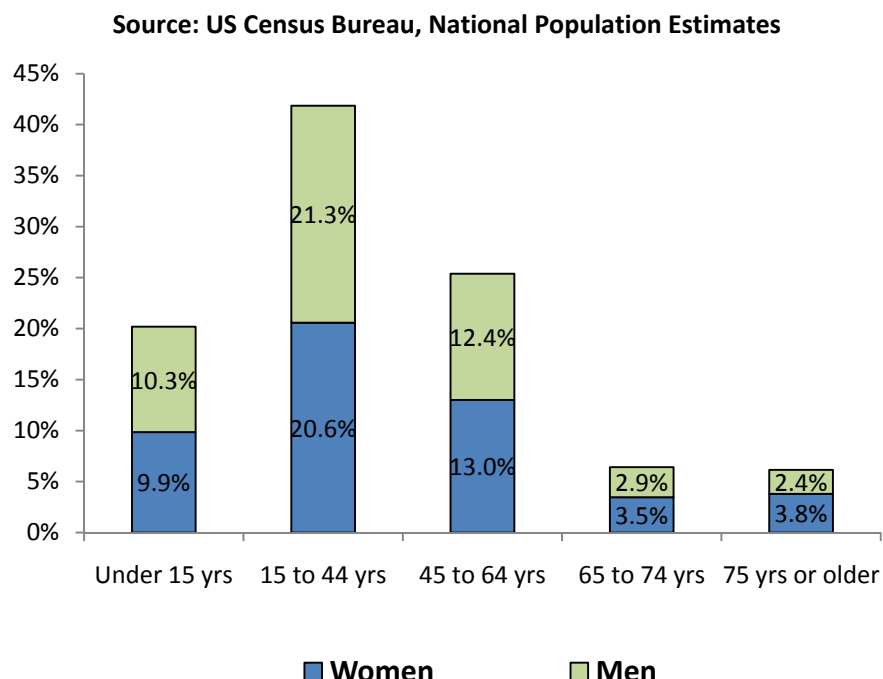
Population Growth and Aging. Many believe that overall population growth and the gradual aging of the population contributes to the growth in healthcare expenditures. A recent study by Health System Change (HSC) estimates that annual per capita health spending increases by about \$74 on average (2001 dollars) for each year between ages 18 and 64. Healthcare spending

increases more rapidly after age 50 (approximately \$152 for each additional year between ages 50 and 64). Per capita health spending for people age sixty-five or older tends to average three to five times that for younger people (Reinhardt, 2003). Despite the growth in the US population and increased spending with age, analysts have concluded population changes alone are not large enough to be a major cost driver of healthcare spending (Strunk and Ginsberg, 2002; Reinhardt, 2003). The literature suggests that aging of the population can account for roughly 2 percent of historic growth in Medicare spending (Smith, Heffler, and Freeland, 2000; Cutler, 1995; Newhouse, 1992).

Figure 7 displays the relative percentage of men and women by age class. The percentages for each age and each gender class are the percentage of the total population. As the graph shows, age classes below 45 years of age (under 15 and 15 to 44 years) have a relative larger proportion of males to females than those age classes above 45 years of age (45 to 64, 54 to 74, and 75 yrs or older). In these older age classes, the relative proportion of females exceeds that of males. The greater proportion of females is particularly pronounced as women age (due to longer life expectancies).

Although population growth and aging have had a small effect of healthcare spending overall, the impact may accelerate as a result of the aging of the “baby boom” generation. The aging of this segment of the population can be expected to have a predictable impact on the volume of ASC services, particularly because colon cancer screening guidelines and cataracts are age related. Between 2000 and 2010, for example, the U.S. Census estimated that the population age 50 to 75, the age recommended for regular colon cancer screening, grew by 2.7 percent per year, on average. This growth was faster than the growth rate for the general population.

Figure 7. General Population Estimates as a Percent of Total Population, Distributed by Gender and Selected Age Groups, July 1, 2007



Median Incomes. Income is one factor that influences the demand for healthcare services, with demand for health services increasing with income. However, in empirical studies income is often associated negatively with healthcare spending, as higher incomes are usually correlated with better access to care and higher health status. In summarizing the literature, CBO stated that increasing incomes accounted for 5 to 20 percent of long-term healthcare spending growth (CBO January 2008).

Changes in Health Status. Some of the underlying factors influencing the increase in medical spending include the increase in chronic diseases or the increased prevalence of certain diseases. Trends in health status, population health guidelines, shifting diagnosis and reporting patterns, and general lifestyle changes impact the prevalence of chronic diseases (Thorpe and Ogden, 2008). As population health guidelines change to reflect improved ability to screen for certain conditions, this may increase detection and result in a greater proportion of the population reporting those conditions. Similarly, as general lifestyle behavior improves (e.g., nutrition and exercise) disease rates may improve or general health status may improve (Thorpe, 2008). Over the past ten years, the overall trend in health status demonstrates mixed results. Figure 8 displays the self-reported health status for 1998 and 2008.

Individuals self-reporting very good or good health status increased modestly. In these years, those reporting very good health increased from 34 to 35 percent and those reporting good health increased from 28 to 30 percent. However, the percentage reporting excellent health declined and the percent reporting fair or poor health increased. The most significant change in health status appears in the percent of individuals reporting excellent health, where the percent declined from 24 to 20 percent. The increases in fair or poor health were modest (from 10 to 11 percent and 3 to 4 percent, respectively).

We observe a downward trend in the overall health status. However, the trend reflects the growing diversity in the US and the related health and healthcare needs of the changing population (DHHS, 2008). In addition, the trend may reflect the changing health guidelines and the associated awareness of the need for screening and regular medical exams.

Changes in Disease. The three most common chronic diseases – diabetes, high serum total cholesterol and hypertension – are associated with other more serious conditions such as heart disease or chronic kidney disease.

Figure 9 displays the percent of the US population with the selected chronic conditions. The percent of the population reporting diabetes and hypertension has increased over the twenty year period displayed in Figure 9. Diabetes increased from 8 to 10 percent of the US population, while hypertension increased from 26 to 31 percent. However, the percent of the population reporting high serum cholesterol declined from 21 to 16 percent for the same period.

The growth in the population with diabetes may have contributed to the growth in the volume of services provided by ASCs over the last several years. People with diabetes are 60 percent more likely to develop a cataract (American Diabetes Association, 2009). In addition, cataracts develop earlier in those with diabetes and may be more severe than for non-diabetics. People with diabetes also are 40 percent more likely to develop glaucoma (American Diabetes Association, 2009). Thus, growth in the number of diabetics in the U.S. resulted in increase demand for cataract and other eye

surgeries. With the growth in the percent of American that is overweight or obese, the number of people with diabetes is expected to grow, which could contribute to growing use of healthcare services, including necessary surgical services offered by ASCs.

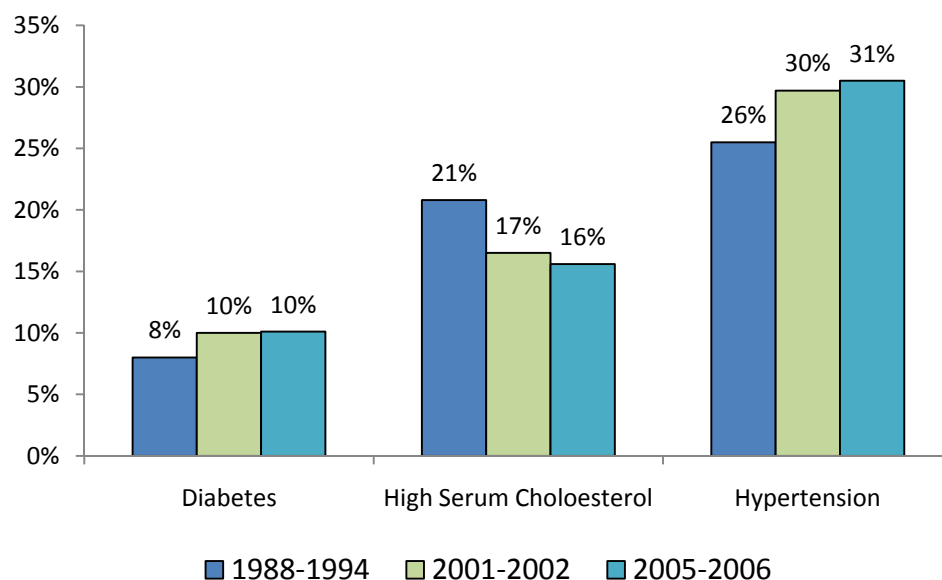
Figure 8. Self-Reported Health Status, 1998 and 2008

**Source: Centers for Disease Control and Prevention (CDC),
Behavioral Risk Factor Surveillance System Survey Data**



Figure 9 Percent of US Population with Selected Health Conditions, Selected Years

Source: CDC/NCHS, National Health and Nutrition Examination Survey



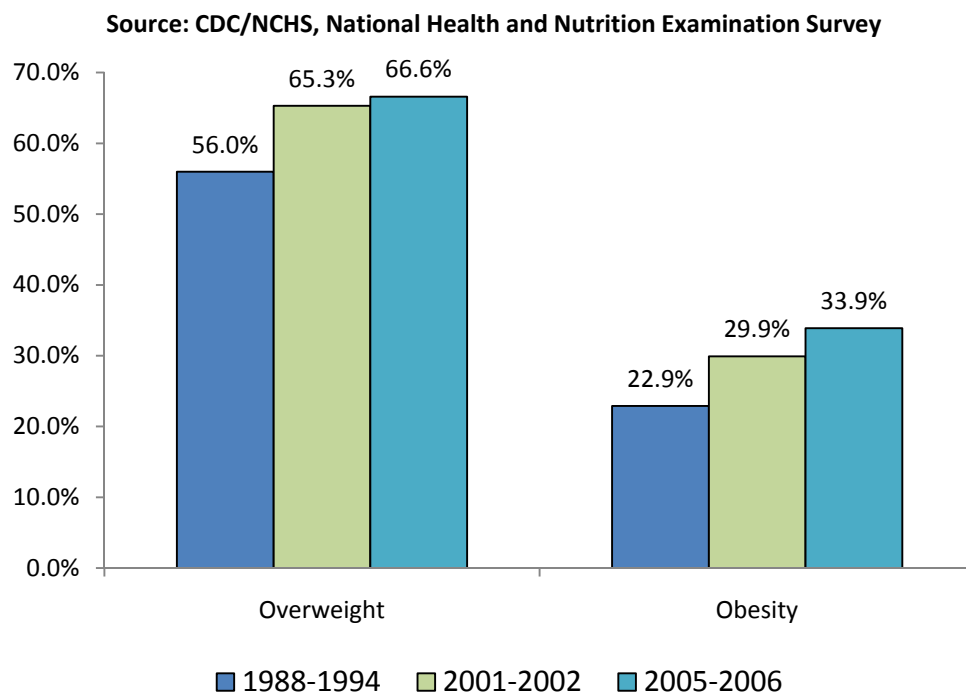
General Lifestyle Changes. Lifestyle choices can influence a person's health and overall wellness. Three important choices include the use of tobacco products, maintaining appropriate weight, and incorporating physical activity into a regular routine.

Tracking the trends in lifestyle choices provides an indicator of potential health risks (DHHS, 2008). As with the other health indicators, the results are mixed. The trends show significant reductions in the percent smoking and modest increases in the percent incorporating any exercise into their lifestyle. However, efforts to maintain an appropriate weight have fallen short.

Excess body weight is associated with excess morbidity and mortality. Obesity is correlated with excess mortality as well as increasing the risk of heart disease, diabetes, osteoarthritis, and disability. (NIH Guidelines, 1998) Unfortunately, the proportion of American adults who are obese continues to increase, rising to approximately one-third of all American adults. Figure 10 depicts the increase in the US population reporting that they are either overweight or obese. As the graph indicates, the trend is increasing, but appears to slow somewhat in the most recent periods. According to CBO estimates, changes in body weight can explain about 4 percent of the growth in healthcare spending (CBO 2008).

There is strong evidence associating a higher body-mass index with increased risk of age-related cataract, glaucoma, and other conditions of the eye (Weintraub et al., 2002; Cheung and Wong, 2007). In addition, obesity has been linked to increased prevalence of colon polyps and cancers (Wilkins and Reynolds, 2008; Siddiqui et al, 2009). Therefore, the rise in number of people who are overweight and obese is a contributing factor to the growth in ASCs.

Figure 10. Percent of Persons in the United States Overweight or Obese, Selected Years



Regular Physical Activity. In recent years, American adults have made only modest progress towards achieving recommended levels of physical activity or strength training. (DHHS, 2008) Less than three percent introduced some physical activity into their lifestyle.

Physical activity guidelines from the DHHS encourage incorporating exercise, because of the importance to overall health. Studies suggest that regular exercise may reduce the risk of premature mortality and reduce risks of coronary heart disease, diabetes, colon cancer, hypertension, and osteoporosis (CDC, 1996).

Population Health Guidelines. Evaluating health guidelines for disease screening and clinical practice changes is an ongoing process. As the population demographics change and technological and clinical advances emerge, guidelines are adapted. The U.S. Preventive Services Task Force (USPSTF) is the leading independent panel of private-sector experts in prevention and primary care. The USPSTF conducts impartial assessments of scientific evidence for the effectiveness of a broad range of clinical preventive services, including screening, counseling, and preventive medications. The USPSTF evaluates the benefits of individual services based on age, gender, and risk factors for disease. They make recommendations about which preventive services should be incorporated routinely into primary medical care and for which populations, as well as identify a research agenda for clinical preventive care.

The NGC is an initiative of the Agency for Healthcare Research and Quality (AHRQ, US DHHS) and was created originally by AHRQ in partnership with the American Medical Association and the America's Health Insurance Plans (formerly AAHP). The NGC with its associated programs – Health Care Innovations Exchange and the National Quality Measures Clearinghouse – provides detailed information regarding (current and historical) health guidelines for patient education, disease and condition screening, as well as changes in treatment for diseases and conditions. The NGC catalogs thousands of guidelines by disease, condition, treatment, and interventions. In addition they provide an ongoing update for guidelines in progress (currently 499 guidelines in progress). One example of changes in health guidelines includes colorectal cancer screening.

The current clinical guidelines indicate that patients 50 years old (or if African American, 45 years old) with no personal history of polyps, inflammatory bowel disease, or colorectal cancer should begin regular screening for colorectal cancer. Patients with a (single first-degree) relative diagnosed with colorectal cancer before age 60 may put the patient at a slightly increased risk and may indicate earlier colorectal cancer screening. These guidelines replace the original guidelines released in 1995. Those original guidelines are subject to annual updates as additional research becomes available.

The percent reporting that they ever had a colonoscopy or sigmoidoscopy increased from 41 to 59 percent between 1997 and 2008. Nevertheless, the percent of people age 50 or older who report having colon cancer screening in the last 5 years varies across states (See Map 4 at the end of the document).

Health Insurance Coverage Statistics. The vast majority of people with private coverage receive this coverage through employer-provided plans. A recent Census Bureau survey indicates that 52 percent of people in the U.S. have employer-provided health insurance coverage. Employer plans

provide an important source of health insurance. However, the proportion of US workers with coverage has declined slightly over the past ten years. (BLS, various years) In addition, the cost to employees associated with this coverage continues to increase over time (KFF, 2008). Twenty-five percent reported having public insurance coverage (including Medicare, Medicaid, and Military programs). Approximately 14 percent had no insurance, public or private, in 2006. Although changes in insurance coverage can be an important determinant of healthcare spending, we do not believe that this was an important driver of ASC service volume since 2000.

b. Factors Affecting the Migration of Services from Inpatient to Outpatient Settings

Payment Policies. As the Medicare inpatient prospective payment system (PPS) was introduced during mid-1980s, hospitals began to shift more surgeries to hospital outpatient departments (Poole, 1999). Since its introduction, many private insurers subsequently adopted systems similar to the Medicare inpatient PPS to pay for inpatient services. Thus, the financial incentives inherent in an inpatient PPS to encourage shifting of services from the hospital inpatient to outpatient settings extends well beyond the Medicare program. In addition, the growth of managed care during the late 1980s and 1990s further encouraged providers to perform more surgery in a less-costly outpatient setting rather than on an inpatient basis (Detmer and Gelijns, 1994).

Technological Advances.⁷ Much of the growth in outpatient surgeries would not be possible without technological improvements that have allowed for faster recovery (AHRQ, 2003; MedPAC 2006).⁸ These advances include many new surgical techniques, using micro-instrumentation resulting in fewer and smaller wound sites. Improvements in anesthesia and pharmaceuticals include new drugs that minimize nausea and fatigue following administration, more localized and regional approaches to anesthesia resulting in less frequent use of general anesthesia for certain procedures, better monitoring systems for all anesthesia (including pulse oximetry), and better muscle relaxants that wear off sooner. Recovery time immediately following surgery and healing time for many procedures has been significantly reduced.

The introduction of new surgical approaches such as laparoscopic procedures over the past decades has resulted in surgeries taking significantly less time with lower infection rates and less need for wound management. One example of the remarkable advances in surgery is gallbladder surgeries. "Gallbladder surgeries performed in the 1990s would often result in significant scarring and a lengthy recovery period as an inpatient, whereas now patients can go to an ASC and be back at work two days later" (Expert Interviews). Over the past several decades, these laparoscopes have become smaller and more flexible and are now being used for hysterectomies and appendectomies.

Colonoscopies are now performed routinely in ASCs. In addition, more frequent colon cancer screening using colonoscopies has resulted in more ancillary treatments such as the removal of

⁷ Specifics about technological improvements and medical advances were communicated during the expert interviews. See Section III for a description of methods.

⁸ The influence of technological and clinical advances is well documented. See for example, the Medicare Payment Advisory Commission, Further analyses of Medicare procedures provided in multiple ambulatory settings: An introduction, October 2006 and the Health Care and Utilization Project, Fact Book 9, "Ambulatory Surgery in U.S. Hospitals, 2003" documents four procedures that were exclusively performed on an inpatient basis, but now are performed primarily on an outpatient basis.

nodules and hemorrhoid ligations. Scopes are also used routinely in gastrointestinal surgery to address issues such as acid reflux as well as esophageal reflux in pediatric patients.

There have also been significant improvements in the hardware used, such as fusion screws, better plates and other equipment, primarily for orthopedic procedures such as shoulder and knee repairs as well as bone replacements. The volume of these procedures in ASCs has increased as advances have been made. The advent of regional and localized anesthesia combined with these advances has allowed hip replacements to be performed on an outpatient basis in carefully selected patients.

These advances have also resulted in a significant increase in spine surgeries in the outpatient setting over the past five years. These surgeries are expected to increase further as medical advances occur and further diffuse throughout the country. The primary factors contributing to the growth in spinal surgeries and shift to the outpatient sector have been the faster recovery and earlier mobility of patients following the introduction of micro-instrumentation, minimally invasive procedures, and improvements in anesthesia.

These advances have had a significant impact on improving convalescence and quality of life for patients. In the past decade, these surgeries “have been the result not so much of new procedures as new approaches to surgery.”⁹

Changes in technology interact with patient (and physician) preferences to further drive the use of outpatient surgery. Surgeries that would have earlier been delayed or avoided by patients have become more appealing and manageable. For example, the advent of laser surgery and new technology for cataracts has cut down the surgical and recovery time. These changes may result in increased patient demand for surgery as well as increased willingness of physicians to perform surgery on patients who were previously considered poor candidates prior to the improvements in treatment.¹⁰ Patient satisfaction appears to be higher for surgery when performed in the most convenient and least intimidating settings, such as ASCs (Press Ganey Associates, Inc., 2008).

c. Factors Affecting the Ambulatory Surgery Site of Service

Consumer preference. As technology and innovations have led to a safer ambulatory surgery experience, patients have been quick to show their preferences. In a RAND, 2008 paper prepared for the Assistant Secretary for Planning and Evaluation at CMS, a specific note was made of a recent survey indicating that patients would prefer to undergo surgery in an ASC or physicians’ office over an HOPD. The most important factors influencing patient preferences were shorter waiting periods (because of the speed with which they receive service), greater comfort, and less bureaucracy (RAND, 2008).

⁹ Expert interviews. See Section III for a description of methods.

¹⁰ Expert interviews.

Patients value the convenience, aesthetics and non-institutional setting offered by ASCs (AHA, 2006; Haugh, 2006). One recent survey of outpatient surgery patient satisfaction indicated that in excess approximately 90 percent of patients had high satisfaction (Press Ganey Associates, Inc., 2008). Patient satisfaction is seen as a critical competitive advantage of most freestanding surgical centers. Over time, as consumers have become better informed and increasingly health conscious, consumer preference is likely to continue to play an important role in the use of ASCs.

Physician preference. No single explanation exists for the increasing physician preference for performing procedures in a freestanding ambulatory surgical center. A RAND survey participant noted that “practices would perform the procedures in the safest and most convenient location unless the facility payments received were insufficient to cover the cost of the services or insurance requirements mandated physicians to redirect.” (RAND, 2008)

ASCs offer a predictability and efficiency in scheduling that HOPDs do not. Physicians value the fact that scheduled surgeries are not “bumped” or delayed by procedures that come through the hospital emergency department. Short turnaround times and specialized focus by nurses and other support staff at ASCs further increase the efficiency of the surgeon. (Haugh, 2006; AHA, 2006).

In addition to avoiding the inefficiencies that may arise from using an operating suite which must also meet inpatient and emergency needs, other simple conveniences available in a freestanding center may also save both physicians’ and patients’ time. For example, both physicians and patients often need to park further away from the surgical area when arriving at a hospital-based center. In addition, patients may need to take more time off of work to navigate the larger hospital bureaucracy in place for basic business operations such as registration.

Another factor contributing to this shift in care from hospitals to freestanding facilities may be that physicians face increased reimbursement pressure as Medicare reimbursement increases have often not kept pace with their increasing business expenses. One way for physicians to compensate for this decreased margin is to increase efficiency when providing services. Many ASCs offer increased efficiency without sacrificing quality. “If I’m a surgeon and I do a high volume of procedures that lend themselves to ambulatory surgery, it is hugely more efficient for me in terms of controlling my time and in having staff responsive to my needs to be part of an ASC, generally speaking, because they are geared to be very short turnover, very efficient, very user-friendly. The demands upon operating endoscopy facilities in large hospitals are numerous and it is virtually impossible for many of them to offer that same level of scheduling, predictability, and service to users” (MedPAC, Public Meeting 12/4/08. Commentary from Commissioner Karen R. Borman, M.D., p. 120-121).

Hospitals are often partners in ASC joint ventures with physicians. Hospitals undertake such joint ventures or other partnerships for a multitude of reasons. Some hospitals seek to attract more business and stronger collaboration with their staff physicians through strengthening partners and developing more satisfied physicians (Haugh, 2006) Hospitals also may be seeking to improve their community image and presence through centers seen as more “patient friendly” or convenient. Joint ASC ventures between hospitals and physicians can also be part of vertical integration strategies with the goal of further tying physicians into an integrated delivery system. Another reason for joint ventures may also be to avoid the possibility of having physicians competing directly with hospitals should the physicians express interest in establishing their own ASC. Finally, the hospitals may seek to ease the overburden on hospital based operating suites that serve emergency, inpatient and

outpatient surgical cases. Moving ambulatory surgery patients out of the hospital-based suites may provide the necessary extra capacity for inpatients and emergency department services.

Insurer policies including Medicare payment policy. Many commercial payers recognize that ASCs offer significant savings to their members and are, thus, less restrictive than Medicare has been in the types of services covered in an ASC. As described below, commercial payers have had several tools at their disposal to facilitate the movement of patients from HOPDs to ASCs.

- Many commercial payers offer reimbursement opportunities for freestanding centers. Where a physician is a partner in the center, this reimbursement opportunity may represent a second avenue of compensation for their services, above the reimbursement currently received for professional services.
- Some payers have moved towards monitoring the cost efficiency of their provider network, including offering reports to physicians on their performance. Where freestanding ASCs are considered efficient, quality providers, physicians are incentivized to move patients to this setting in order to achieve higher performance scores and be recognized as quality and “cost efficient” providers.
- Select payers in specific markets offer improved professional compensation for those physicians that move patients to freestanding ASCs. These payers expect the increased expenditure for professional services will be more than offset by the savings that are realized by moving patients from the HOPD to a freestanding ASC.

Where physicians have been successfully incentivized to move some or all of their commercial patients to ASCs, often their other patients are moved to the freestanding center as well to maintain their practice efficiency. Thus, when possible, a physician will schedule all surgeries for a given day, regardless of the payer, in one venue. As a result, all payers, regardless of whether they offer an incentive to physicians to use ASCs, often benefit from the movement of patients to a freestanding center.

The ability of commercial payers to continue to drive this growth has become increasingly limited. Much of the capacity has already been moved through the established financial incentives. Where additional procedures could be shifted from hospitals to freestanding facilities, physician supply, CON laws, other regulations or other market forces limit the ability for supply to grow.

Prior to 2008, Medicare did not pay ASCs for procedures that were commonly performed in a physician office. These procedures are now covered when performed in an ASC, although the ASC payment is capped at the non-facility practice expense payment amount in the physician fee schedule. With the 2008 payment rule, CMS has shifted its policy from one where the burden was on providers and others to demonstrate that a service could be safely provided in an ASC to be covered under Medicare to one in which procedures covered in the HOPD are covered in the ASC unless CMS finds them to be unsafe in ASCs or require an overnight stay. CMS itself estimates that this will cause 15 percent of surgical procedures to move from the physician’s office to the ASC. (RAND, 2008)

In summary, Medicare designed a freestanding ASC payment system that saves Medicare funds when services are moved from the HOPD to the ASC. This is driven by the payment differential between HOPDs and ASCs.

State regulations. Differing state regulatory requirements have led to varying penetration of ASCs in each state. ASCs are more prevalent in states lacking CON requirements (See Map 3 at end of document). (AHA, 2006). Currently, there are 27 states with CON laws that cover freestanding ASCs; 10 with CON laws that do not include ASCs; and 14 with no CON laws (data from the ASC Coalition) (See Map 3 at the end of the document). In addition, CON regulations and state practice of medicine regulations may be written in such a manner as to permit ambulatory surgical services to be provided in settings with much in common with traditional freestanding centers but that are governed outside of the CON regulations.

Based on the literature review and expert interviews, we conclude that there are a number of important reasons for the growth of ASCs, some of which are hard to quantify. Overall healthcare drivers, particularly changes in disease prevalence and aging population, are likely to have had a consistent, although relative small, affect on ASC growth rates. Specific examples include growth in diabetes and obesity rates, which increase the incidence of cataracts and other eye problems as well as colon cancer and pre-cancerous polyps. Technological advances that have allowed surgical services to move from inpatient to outpatient settings have also been important. The impact of advances in surgical techniques, instrumentation, pharmaceuticals to manage post-operative pain, and anesthesia seem likely to exert a significant impact on the future demand for care provided in ASCs. Finally, patient and physician preferences for ASC may account for some growth in the use of ASCs, but the impact of these effects is hard to quantify.

V. Medicare ASC Services: Which Types of Services Have Driven Growth?

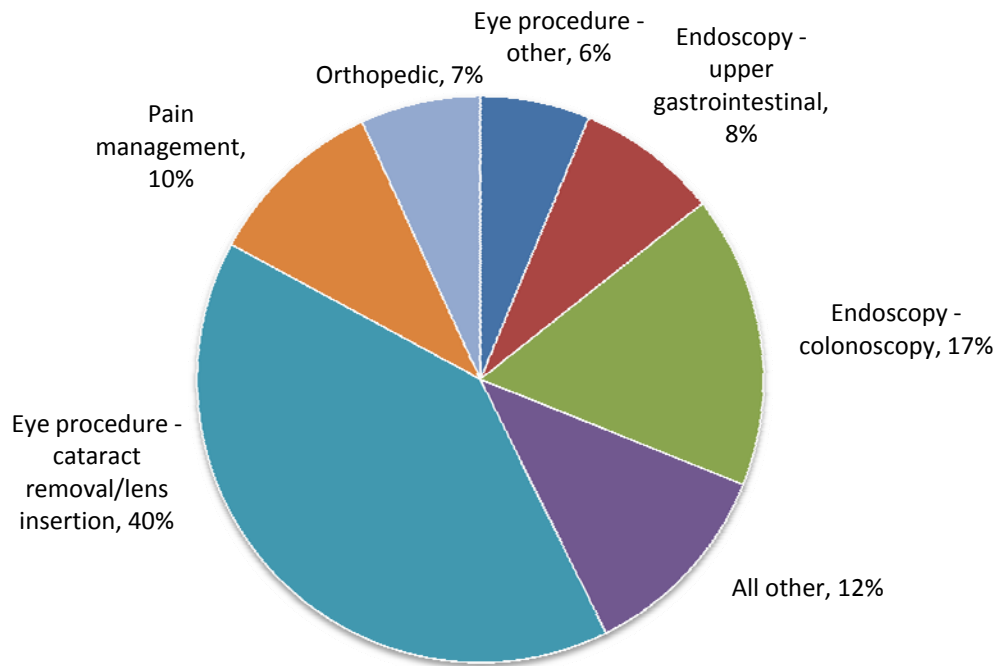
In this section, we consider the types of services that have been responsible for the growth in Medicare allowed charges. In reporting growth rates, we consider two approaches to classify services. The first classification system is the Berenson-Eggers Type of Service (BETOS) groupings. The BETOS coding system was developed primarily for analyzing the growth in Medicare expenditures. It covers all HCPCS codes and consists of readily understood and stable clinical categories. The second approach is based on the type of service specialty. The mapping of services to specialty categories was provided by the ASC Association. While there is some overlap between the BETOS categories and ASC specialty assignment, important differences exist in how they classify the types of services typically provided in an ASC. For example, the BETOS system divides endoscopy services into many subcategories, including Endoscopy - Colonoscopy (P8D) and Endoscopy – Upper GI (P8B), while the ASC specialty groups these services under GI. The ASC specialty groups break out Pain Management services and Orthopedics into their own category, where the BETOS system does not. Therefore, we report the results by combining the BETOS and select ASC specialty groupings.

In 2007, Medicare payments to ASCs totaled approximately \$2.8 billion or \$88 per 1,000 Medicare beneficiaries. The distribution of Medicare ASC payments by type of service is presented in Figure 10 below. Forty-six percent of Medicare payments for ASCs were for eye procedures, with most of that going to cataract removal/lens insertion procedures (40 percent) (Figure 11).

Endoscopy, including colonoscopy and upper GI procedures, collectively accounted for 25 percent of ASC Medicare payments in 2007. Medicare spending on pain management procedures and all other services were 10 and 12 percent, respectively.

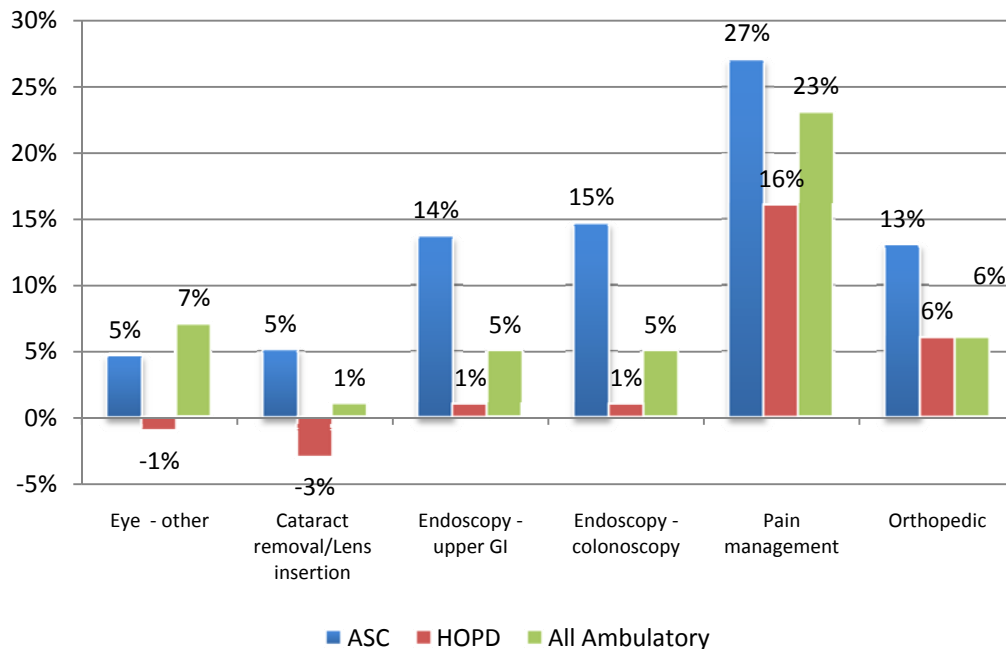
Figure 11. ASC Share of Medicare Allowed Charges by Type of Service, 2007

Source: KNG Health analysis of PSPS files. Includes Medicare FFS claims only.



In Figure 12, we show the average annual growth per capita in Medicare allowed services from 2000 to 2007. Although eye procedures represent the largest share of Medicare spending for ASCs, these services experienced the slowest growth since 2000, with eye procedures growing by 5 percent a year in ASCs. Colonoscopy and endoscopic upper GI procedures increased by an average annual rate of 15 and 14 percent, well above the growth rate for these groups of services across all ambulatory settings. Orthopedic services increased by 13 percent per year in ASCs. Pain management services grew the fastest for ASCs and across all ambulatory settings at 27 and 23 percent, respectively.

Figure 12. Average Annual Growth per Capita in Medicare Allowed ASC Services by Category, 2000 to 2007



Source: KNG Health analysis of Medicare PSPS files. Includes Medicare FFS claims only.

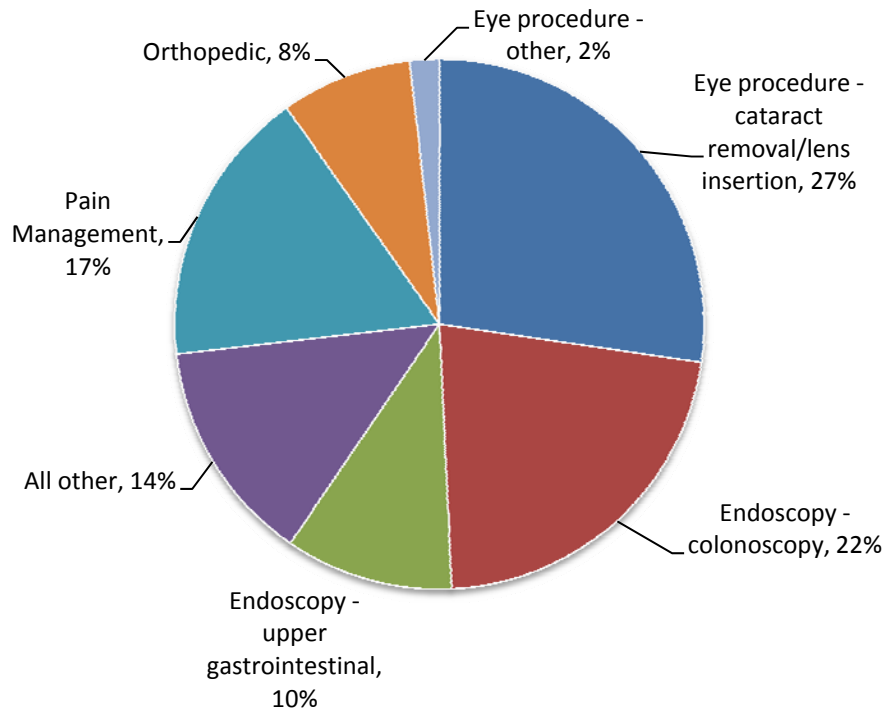
Notes: Chart includes mix of BETOS categories (eye procedure - cataract removal/lens insertion (P4B), Endoscopy - colonoscopy (P8D), Endoscopy - upper GI (P8B), Eye procedure - other (P4E)) and specialty (Pain Management Orthopedics). Mapping of procedure codes to specialty provided by the ASC Association.

The rapid growth of pain management services in ASCs and in the larger ambulatory market as a whole may reflect the recent development of techniques and a growing recognition by providers and Medicare beneficiaries that pain is a treatable condition. In these respects, pain management can be characterized as a relatively new service line. In contrast, cataract and other eye surgeries have been accepted and provided in HOPDs and ASCs for many years. As a healthcare service area becomes more established, growth rates tend to stabilize.

In Figure 13, we show each category's contribution to the overall growth in Medicare allowed charges for ASCs. Two factors determine a service category's contribution to growth: (1) its growth rate; and (2) the share of ASC spending accounted for by a service group. A service's contribution to overall growth increases with its share of total spending and its growth rate.

Despite its relatively modest growth rate, Eye Procedures - Cataract Removal/Lens Insertion accounts for the largest share of growth in payment between 2000 and 2007. This finding is a function of the large share of Medicare ASC spending for these services. Endoscopy - Colonoscopy represents the next largest contributor to growth. In fact, endoscopic procedures in general are the largest driver of ASC growth, accounting for 32 percent of changes in Medicare payments. By comparison, eye procedures account for a combined 29 percent of the growth since 2000.

Figure 13. Contribution to Growth in Medicare Allowed Charges by Type of Service, 2000 to 2007



Source: KNG Health analysis of Medicare PSPS files. Includes Medicare FFS claims only.

Notes: Chart includes mix of BETOS categories (eye procedure - cataract removal/lens insertion (P4B), Endoscopy - colonoscopy (P8D), Endoscopy - upper GI (P8B), Eye procedure - other (P4E)) and specialty (Pain Management Orthopedics). Mapping of procedure codes to specialty provided by the ASC Association.

It is useful to examine how the contributions to growth by BETOS and specialty category have changed over time. In Table 2, we show the contributions to Medicare ASC spending for the period from 2000-07, 2000-03, 2003-06, and 2006-07. The most notable findings from this table are that the contribution to growth of pain management services have increased significantly over time, while Eye Procedures – Other experienced a significant decrease in their contribution to growth. Pain management went from representing 4 percent of Medicare ASC spending in 2000 to 10 percent in 2007.

Table 2. Contribution to Growth in Medicare Allowed ASC Charges by Service Category

Service Category	Contribution to Growth Between:			
	2000-07	2000-03	2003-06	2006-07
Eye proc - cataract removal/lens insertion	27%	29%	23%	36%
Endoscopy - colonoscopy	22%	23%	19%	25%
Endoscopy - upper gastrointestinal	10%	9%	12%	10%
Eye procedure - other	2%	6%	4%	-26%
Pain Management	17%	13%	19%	28%
Orthopedic	8%	8%	9%	7%
All other	14%	12%	14%	20%
Total	100%	100%	100%	100%

Source: KNG Health analysis of Medicare PSPS files. Includes Medicare FFS claims only.

Notes: Table includes mix of BETOS categories (eye procedure - cataract removal/lens insertion (P4B), Endoscopy – colonoscopy (P8D), Endoscopy - upper GI (P8B), Eye procedure – other (P4E)) and specialty (Pain Management Orthopedics). Mapping of procedure codes to specialty provided by the ASC Association.

a. Colonoscopy and Upper GI Endoscopy

Colonoscopy. By specialty, gastrointestinal services have been the biggest contributor to ASC growth since 2000 and, within GI, colonoscopy has been an important factor. In some states, including Florida, Nevada, Tennessee, Washington and others, more than half of all colonoscopies are performed in ASCs. The ASC penetration for upper GI procedures is even higher, with 11 states having more than half of these services performed in ASCs (See Maps 4 and 6 at end of document).

The growth in colorectal cancer screening is critically important from a public health perspective. Colorectal cancer is the third most common type of non-skin cancer in men, following prostate and lung cancer, and in women, after breast and lung cancer (National Cancer Institute (NCI), Colorectal Cancer Screening). The median age for diagnosis of cancer of the colon and rectum is 71 years, with over 50 percent of the diagnoses being made in individuals 65 to 84 years old (NCI SEER, Colon and Rectal Cancer). The age-adjusted incidence rate from 2002 to 2006 was 49.1 per 100,000 men and women per year.

In January 2006 in the United States, there were approximately 1,104,102 individuals alive who had a history of colorectal cancer (SEER, p. 2). Colorectal cancer screening detects polyps and lesions which can develop into colorectal cancer. With colonoscopy screening, diagnosis and treatment occur concurrently with the removal of the potential problem areas. It may be one of the most effective ways to prevent colorectal cancer development (NCI, p. 3). In addition, colorectal cancer is generally more amenable to treatment when discovered early in the disease process (NCI, p. 3). Other forms of detection do not allow for concurrent treatment.

The National Cancer Institute cited a nearly 26 percent decline in colorectal cancer incidence rates between 1984 and 2004, which it attributed to cancer screening (NCI, Cancer Advances in Focus,

Colorectal Cancer, p. 1). The National Cancer Institute remains concerned that less than half of those fifty years or older are screened, noting the need to better encourage people to take advantage of the available methods for colorectal cancer screening (NCI, Cancer Advances in Focus, Colorectal Cancer, p. 2). In 18 states, fewer than 46 percent of the population had received a colonoscopy or sigmoidoscopy in the past 5 years (See Map 5).

Colorectal cancer is the second leading cause of cancer death in the United States (Centers for Medicare and Medicaid Services, Provider Resources: Colorectal Cancer Screening). Medicare has provided coverage for colon and rectal cancer screening to high risk individuals since 1998, and in 2001 the benefit was extended to average risk individuals. Medicare itself noted “the use of this benefit has been less than optimal” with only 52% percent of Medicare beneficiaries being screened between 1998 and 2004 (CMS, Provider Resources: Colorectal Cancer Screening). Currently, for individuals not considered to be at high risk for colorectal cancer, Medicare covers one screening colonoscopy every 10 years, but not within 47 months of a previous screening flexible sigmoidoscopy. For those Medicare beneficiaries considered high risk, one screening colonoscopy every two years is covered.

For the past several years, there has been significant public health outreach initiatives focused on reducing colorectal cancer incidence and mortality rates by increasing colorectal cancer screening. One example of a national goal, as articulated by the Centers of Disease Control (CDC) in *Healthy People 2010*, is to reduce the colorectal cancer death rate by 34 percent and increase the proportion of adults who receive a colorectal cancer screening exam.

Public health efforts include a colorectal cancer screening demonstration program established by the CDC at five sites across the US. This demonstration program is designed to increase screening among low-income individuals with no or limited health insurance coverage (CDC web site, cdc.gov/cancer/colorectal/what_cdc_is_doing). In addition, the CDC is funding projects to identify effective intervention techniques for increasing colorectal cancer screening. CMS has joined with CDC in publishing several brochures on colorectal cancer entitled “Let’s Break the Silence, Colon Cancer Screening Saves Lives” and “Basic Facts on Screening”, each of which encourages screening for colorectal cancer. To further support colorectal cancer screening, Medicare waived the deductible for screening colonoscopy beginning in 2007 (CMS, MLN Matters, MM5127). In addition, coinsurance for colonoscopy is now 25 percent when performed in ambulatory surgical centers and in non-outpatient prospective payment system hospital outpatient departments (CMS, MLN Matters, MM5387).

CDC also sponsors *Screen for Life: National Colorectal Cancer Action Campaign* which is a multimedia initiative to promote colorectal cancer screening. Spokespeople for this campaign include Golden Globe® and Academy Award® nominated actor Terrence Howard; Emmy® Award winner Jimmy Smits; Academy Award® winning actress Diane Keaton; and Katie Couric. As noted by the Agency for Healthcare Research and Quality, celebrity spokespersons can have a substantial impact on cancer screening rates (ahrq.gov/research/nov03.) (Cram et al., 2003). The example cited in this article is Ms. Couric’s campaign which resulted in a significantly higher post-campaign colonoscopy rate that was sustained for nine months after the campaign (1.3 per 1000 members in the 14 months prior to the campaign versus 1.8 in the 9 months afterwards).

The *Screen for Life* campaign also has partnerships with 50 state health departments, two tribal organizations and the District of Columbia.

Clear recommendations for colorectal cancer screening have been established and were recently updated in 2008 by the USPSTF.¹¹ The National Guideline Clearinghouse indicates that colonoscopy is one recommended method of colon cancer screening (NGC Adult preventive healthcare: cancer screening). The general guideline supported by the American College of Gastroenterology (Rex et al, p. 740) is that all patients should be offered colonoscopy at age 50+ years with follow up exams every 10 years. Colonoscopy is the preferred colorectal screening examination. The 2008 American College of Gastroenterology (ACG) Guidelines updated its 2000 guidelines as follows:

- Screening should begin at age 45 for African Americans.
- Screening tests are now divided into cancer prevention and cancer detection tests. Colonoscopy is considered a cancer prevention test which is preferred over detection tests.
- Individuals with a single first degree relative with colorectal cancer or advanced adenomas diagnosed at age 60 or greater can be screened every 10 years, instead of more frequently.

The strong preference for cancer prevention tests – colonoscopy – and the earlier age for screening of African Americans have expanded the population to be screened. It is also important to note that there is a compounding effect for screening colonoscopies. Once the initial screening is done, the patient is advised to return for repeated screenings every ten years, unless more frequent screening is clinically indicated. Patients who are screened earlier in their lives receive more screening over their lifetime.

The National Committee on Quality Assurance (NCQA) set forth an effectiveness measure to addresses colorectal cancer screening. The current NCQA standard indicates that adults should receive a colonoscopy within the past ten years; double contrast enema in the past five years; fecal occult blood test annually; or flexible sigmoidoscopy in the past five years. Commercial payers are evaluated on their performance against the Healthcare Effectiveness Data and Improvement Set (HEDIS) indicators. As a result, many commercial payers have established outreach efforts designed to increase the use of effective colorectal screening tools. Outreach efforts can be easily identified by reviewing the websites of many commercial plans.

Improvements in anesthesia techniques may have made colonoscopies more acceptable to patients. Over the past 8 or 9 years, propofol has become increasingly popular for colonoscopy sedation. More and more propofol sedation is used in ASCs. Several research studies have indicated that sedation with propofol leads to faster recovery after the procedure and higher patient satisfaction when compared to the use of traditional drugs for sedation (Singh et al., 2008). In the Cochrane Collaborative review, twenty randomized controlled trials were reviewed to determine the relative effectiveness, patient acceptance and safety of propofol for colonoscopy when compared to traditional sedatives. The review of these randomized controlled trials determined that recovery and discharge times were shorter with the use of propofol. In addition, higher patient satisfaction was demonstrated.

¹¹ See <http://www.annals.org/cgi/content/full/0000605-200811040-00243v1>

Upper GI Endoscopy. Endoscopies of the upper gastrointestinal tract are known as EGDs. They involve a medical procedure using a scope to examine the upper part of the digestive tract to both diagnose and treat a variety of problems, such as peptic ulcers and gastroesophageal reflux (GERD or heartburn/acid reflux). The upper digestive system includes the esophagus, stomach, duodenum and the beginning of the small intestine.

According to the American Gastroenterological Association, “upper GI endoscopy can be helpful in the evaluation or diagnosis of various problems, including difficult or painful swallowing, pain in the stomach or abdomen, and bleeding, ulcers and tumors. Tiny instruments can be passed through an opening in the endoscope to obtain tissue samples, coagulate (stop) bleeding sites, dilate or stretch a narrowed area, or perform other treatments.”

Studies have found that early diagnosis with upper GI endoscopy can improve care and outcomes for an elderly population with peptic ulcer hemorrhage (Cooper et al., 2009), Barrett esophagus (Cooper et al., 2002), and can be cost-effective in the diagnoses of cancer if used appropriately.

b. Cataract and Other Eye Surgeries

Ophthalmology surgeries were one of the first to be moved to the outpatient setting, due, in part, to a change in Medicare coverage policy which denied payment for overnight stays for cataracts and other eye surgeries. Today, cataract surgeries that took several hours to perform under general anesthesia in an inpatient setting can now be performed on an outpatient basis in minutes.¹²

As demonstrated from the above data, cataract removal and lens insertion represent the largest segment of all Medicare surgeries performed in ASCs. Nearly all cataract surgery in the United States is performed in an outpatient setting and has been for many years (AAO 2006).

Cataracts are the clouding of the lens in the eye that affects vision and are the leading cause of blindness in the aging population, although they also can occur for various reasons at earlier ages due to trauma and congenital conditions or as a secondary condition of diabetes, glaucoma, or other conditions. They are also the most treatable cause of vision loss in older Americans. As noted in Table 3 below, by age 80, more than half of all Americans either have a cataract or have had cataract surgery.

¹² This information was gathered during the expert interviews described in the methodology section of this report.

Table 3. Prevalence of Cataracts among Adults 40 Years and Older in the United States

Age	Cataract	
	Persons	(%)
Years		
40-49	1,046,000	2.5%
50-59	2,123,000	6.8%
60-69	4,061,000	20.0%
70-79	6,973,000	42.8%
≥80	6,272,000	68.3%
Total	20,475,000	17.2%

Source: National Eye Institute (NEI), Summary of Eye Disease Prevalence
Data from Archives of Ophthalmology, Volume 122, April 2004.

Symptoms of cataracts include decreased visual acuity, contrast sensitivity and color perception and a glare disability. While certain non-surgical interventions can improve vision in people with cataracts, surgery is commonly performed if the condition worsens (Rosenberg et al., 2008).

While increasing knowledge of toxic chemicals, cataract-causing drugs and harmful radiation may enable physicians to reduce the incidence of cataracts over time, changes in the volume of cataract procedures over time is likely to continue to increase. In 2004, 1.8 million cataract procedures alone were performed on Medicare beneficiaries not enrolled in HMOs (AAO, 2006).

Notwithstanding the volume data presented above, the magnitude of vision problems in the older US population is not fully understood, since estimates are based on “best corrected visual acuity and do not reflect the burden of low vision and blindness due to uncorrected refractive error.” Individuals with poor eyesight are also less likely to get necessary eye screening, thus affecting prevalence estimates. Furthermore, state-based blindness registries have not been successful in documenting prevalence, risk factors, or trends in vision loss (NEI, 2006).

Additional public education and screening efforts to reduce vision impairments in the United States are likely to increase the number of eye surgeries. One of the goals of Healthy People 2010 is to “improve the visual health of the Nation through prevention, early detection, treatment, and rehabilitation,” and it includes objectives to “reduce visual impairment due to glaucoma, cataract, and diabetic retinopathy.” (NEI, 2006)

The increasing number of Americans who are obese as discussed earlier in this report, and resulting future increases in the number of Americans with diabetes will likely lead to significant increases in the number with cataracts, diabetic retinopathy and glaucoma. In fact, a recent series of projections reported by the Archives of Ophthalmology related to eye disease projected that the number of cataract cases in the US “among whites and blacks 40 years or older with diabetes will likely increase 235% by 2050” (Saaddine et al., 2008).

c. Pain Management

Pain is one of the leading causes of disability in America. Pain affects more Americans than diabetes, heart disease and cancer combined (American Pain Foundation, Pain Facts & Figures). To draw additional attention to the issues of pain, the Centers for Disease Control (CDC) in its annual chartbook included a special feature on pain (National Center for Health Statistics 2006). Pain has been recognized as an important national issue, and is perhaps best summed up in this 1998 statement by The National Institutes of Health:

“Pain is a significant national health problem. It is the most common reason individuals seek medical care, with millions of medical visits annually; costing the American public more than \$100 billion each year in healthcare, compensation and litigation. Some studies suggest that more than a third of the American population suffers from a chronic pain condition at some point in their life. Pain-related disability presents a significant and costly liability to workers, employers and society. In the workplace, a significant proportion of employees, about 14 percent, take time off from their jobs due to pain conditions.”

Pain in older adults is frequently underreported, “...possibly because of a reluctance to report pain, resignation to the presence of pain, and skepticism about the beneficial effects of potential treatments” (NCHS, 2006). For adults 20 years of age and older who reported pain, 14% percent reported pain lasting 3 months to one year and 42% percent reported pain lasting more than one year (NCHS, 2006). Those persons age 65 years and older reported pain lasting more than one year 57% percent of the time. Sources of pain are wide ranging including arthritis, back problems, cancer, headaches, muscle injuries, sports injuries, and trauma.

Several federal agencies and others have increased their educational efforts to inform the public and healthcare practitioners about pain related issues. Since 2000, The Joint Commission (JCAHO) has

made pain assessment and management a priority in its national standards. JCAHO has also published a brochure for patients entitled "What You Should Know About Pain Management." Such public health outreach efforts have both increased awareness of pain related issues and increased the willingness of patients to seek pain relief.

A variety of treatment options are available for managing pain. The National Institute of Neurological Disorders and Stroke has resources describing many aspects of pain and its management. Specifically, the Institute notes that treatment options range from the noninvasive (exercise, counseling, biofeedback) to minimally invasive (chiropractic, over the counter medication, electrical stimulation) to more invasive techniques such as nerve blocks.

Pain management services provided in the ASC setting generally involve the use of nerve blocks, which employ drugs, chemical agents or surgical techniques to interrupt the relay of pain messages between an affected area and the brain. Local nerve blocks involve the injection of local anesthetics into an area. Regional blocks affect a larger area. Neurolytic blocks use chemical agents to block the pain messages and are used more frequently for treating cancer pain or to block pain in cranial nerves. The American Pain Foundation, *Treatment Options: A Guide for People Living with Pain* outlines in more detail the various injection and infusion therapies available for pain management. Treatment protocols for pain may involve a series of treatments over weeks or months.

The difficulty in studying pain is that by its very nature pain is subjective. Cultural, social and psychological factors influence perceptions of pain. The subjective nature of pain leads many to be concerned about the potential for overutilization of pain management techniques, including nerve blocks. According to industry experts interviewed about growth factors for this report, pain management is the one area in which potential overutilization may be an important consideration, as is evidenced by payers beginning to restrict authorization and payment for invasive procedures for patients who have not yet tried less invasive means of pain management.

In 1997, the American Society of Anesthesiologists (ASA) developed Practice Guidelines for Chronic Pain Management (*Anesthesiology*, V. 86, No 4, April 1997). Further, the rapid growth in the number of pain management procedures in both HOPDs and ASCs has led to the establishment of specific preauthorization criteria by many payers and other pre-approval techniques designed to ensure that less invasive techniques are tried prior to the use of nerve blocks. The specialty itself has begun to take on these issues by beginning to publish practice guidelines. These guidelines are available on the website for the American Society of Interventional Pain Physicians (<http://www.asipp.org/index.html>) and include evidence based guidelines for interventional techniques used in treating chronic spinal pain.

It is important to note that growth in interventional pain management techniques is not as a result of procedures shifting from the hospital outpatient department to freestanding centers; it is driven most by a growth in the overall number of procedures across all sites of service.

In September 2005, the American Society of Interventional Pain Physicians and the World Institute of Pain joined together to establish board certification for interventional pain management. This has led to an increased recognition of interventional pain management as a formal specialty.

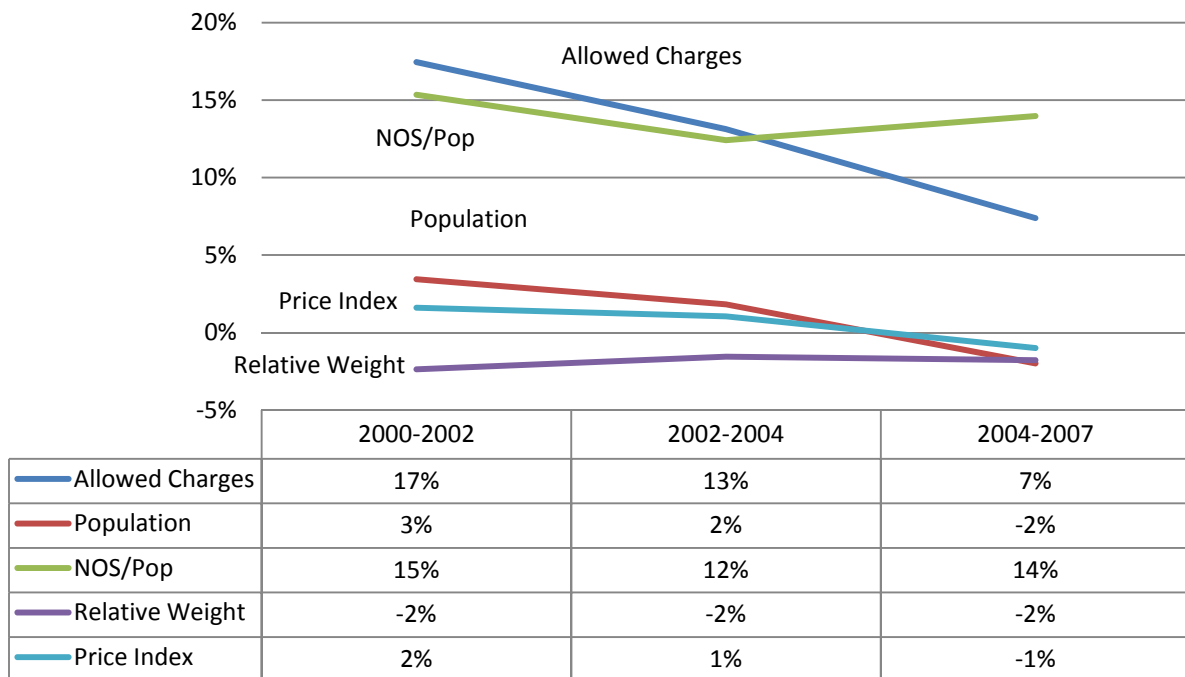
VI. Impact of Changes in Service Volume, Comparative Value, Price, and Shift in Site of Care on ASC Growth

In Figure 14, we report our findings from our decomposition of Medicare ASC spending growth. This analysis examined the extent to which growth in the Medicare population, number of services (NOS) per beneficiary, comparative value, or price changes explain the overall growth in Medicare spending for ASC services. Our measure of comparative value is based on the average Medicare payment for a service after holding constant any year-to-year price fluctuations. Changes in price over time are captured in the price index.

Our findings indicate that almost all of the growth in Medicare spending for ASC services is due to growth in the number of services per beneficiary. This is evident by the high growth in Medicare allowed charges and number of services per beneficiary (NOS/Pop) as show in Figure 14. The rate of change in number of Medicare beneficiaries, comparative values, and prices has been low or negative. Thus, these factors cannot account for the percent growth in Medicare spending for ASCs. Medicare population growth and price changes account for a small but positive amount of the growth. Prices paid by Medicare for ASC services increased between 2000 and 2006, but they fell in 2007 as a result of the DRA provisions. Reductions in comparative values offset some of the growth due to service, population, and price changes. falling by around 11 percent between 2000 and 2007. This reflects the growing share of screening services provided by ASCs.

Based on our decomposition of Medicare growth factors, we conclude that Medicare population changes and changes in ASC prices accounted for 8 and 4 percent of the growth in Medicare spending for ASCs between 2000 and 2007, respectively. Growth in service volume per beneficiary accounted for 102 percent of the growth in Medicare spending, which was offset by 14 percent due to falling comparative values for ASC services.

Figure 14. Average Annual Change in Total ASC Medicare Charges, Population, Number of Allowed Services, Average Relative Weights and Price for Select Years



Source: KNG Health analysis of Medicare data.

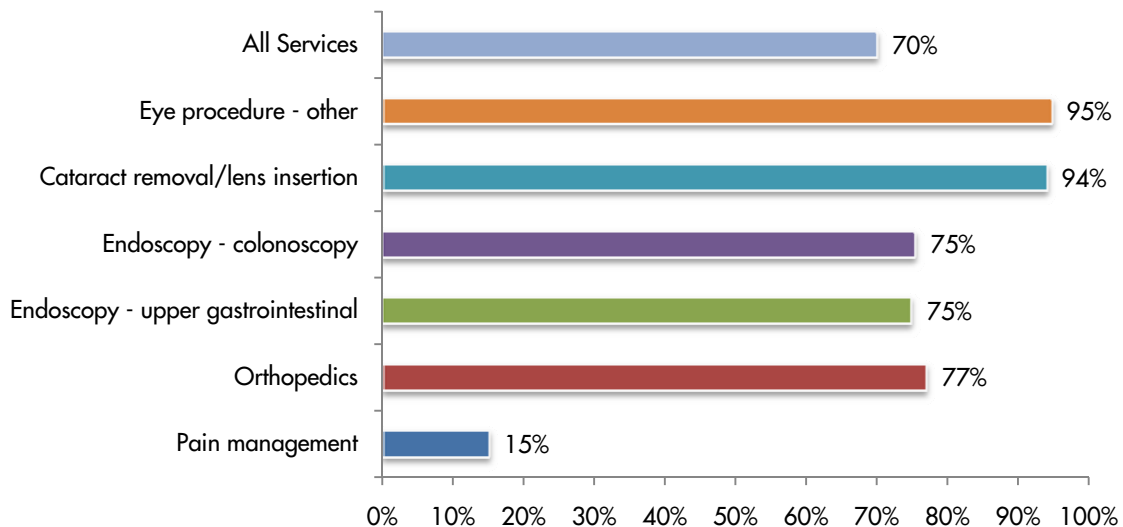
Notes: NOS = Number of services. Average relative weight reflects service mix. Decreasing average relative weights indicates that lower reimbursed services are increasing as a share of all services performed in an ASC. The price index reflects year-to-year changes in average Medicare reimbursement rates for ASC payment groups holding constant the mix of services.

Given the role that the number of services per beneficiary played in driving growth in Medicare ASC spending, we determined the portion of growth in NOS per beneficiary due to care shifting either from (or to) the HOPD or physician offices. We estimate that 70 percent of the growth in the total volume of ASC services per beneficiary between 2000 and 2007 can be attributed to services shifting toward ASCs and away from other settings. The remaining 30 percent is the “expected growth” based on general growth in ambulatory services.

The growth due to shift in site of service showed some variation across types of services (Figure 15). On average, 75 percent of the volume growth in colonoscopy and other endoscopic GI procedures were due to a shift in site of service. Ninety-four percent of the growth in cataract and other eye procedures was accounted for by the same shift in site of service from other settings to ASC. By contrast, we estimated that 15 percent of the growth in pain management services was due to site of service changes. This result is consistent with the observation that much of the growth in pain management procedures observed for ASCs was also occurring for other ambulatory settings (see Figure 12).

**Figure 15. Percent of Growth in ASC Services due to Shift in Site of Service by Selected Category
2000-2007**

Source: KNG Health analysis of Medicare PPS files.



In Table 4, we show how the impact of shift in site of service toward ASCs has changed over time. Generally, we find that the growth due to services moving from the HOPD to the ASC has accelerated over the period from 2000 to 2007. Pain Management shows the largest fluctuations over time in the share of growth that resulted from the shift. The variation for pain management services may be a reflection of the growth and variability in the market for these services.

Table 4. Percent of Growth in ASC Services due to Shift in Site of Service for Select Service Groups and Time Periods

Specialty	2000-07	2000-03	2003-06	2006-07
Endoscopy - upper gastrointestinal	75%	60%	63%	82%
Endoscopy - colonoscopy	75%	69%	68%	88%
Cataract removal/lens insertion	94%	73%	83%	120%
Eye procedure - other	95%	92%	112%	137%
Pain Management	15%	9%	-27%	62%
Orthopedic	77%	74%	60%	86%

Source: KNG Health analysis of Medicare PPS files.

VII. The Role of Demographics, Provider Supply, and Technological Change

To assess how much issues like provider supply, demographics, and technological advancements may have fueled ASC growth, we estimated state-level regression models using cross-sectional, time-series data. Separate models were developed for each of the top volume service categories. Two specifications were used. First, we examined the effects of state-level provider supply and Medicare population demographics on total number of services per 1,000 beneficiaries. The dependent variable, total volume of procedures per 1,000 beneficiaries, includes volume for all ambulatory settings. This model tests the induced demand hypothesis by examining whether the number of ASCs is associated with total ambulatory service volume. Second, we estimated a second state-level regression model in which the dependent variable was the share of Medicare procedures done in the ASC. This two-step strategy to the regression modeling is consistent with our conceptual model.

Each model was estimated using state and year fixed effects. Fixed-effect models are widely used in the econometric literature. The primary advantage of these types of model is that they allow researchers to control for unobserved factors that affect the outcome of interest (volume of surgical services or ASC market share in our case). By controlling for state and year fixed effects, we are controlling for state- and time-relevant factors that may not be captured in our list of explanatory variables but which may affect the number of surgeries. This makes our regression results more robust.

We included the following explanatory variables in each of the regression models:

- ASCs per 100,000 population
- Short-term general hospitals per 100,000 population
- Office Based Physicians per 10,000 population
- Number of surgical physicians as a share of total number of physicians
- % Population Age 75 to 84
- % Population Age 85+
- % Population Male
- % Population Hispanic
- % Population African American
- % Population 65+ Reporting Fair or Poor Health
- Medicare Disabled Share
- Median Household Income

These variables control for provider supply and demographic and other beneficiary characteristics that are thought to affect the provision of healthcare (See our review in Section IV of potential growth factors). We recognize that this list of variables is not an exhaustive list of potential growth factors. The use of a fixed-effects model, however, allows us to focus on the most relevant factors that vary over time and can be easily measured.

In Table 5, we present national trends for ASC and state-level characteristics included in the regression model. The number of ASCs per 100,000 people (Medicare and non-Medicare) grew from 1.2 in 2000 to 1.7 in 2006, an increase of 42 percent. By contrast, the number of short-term general hospitals per capita has remained almost unchanged. We find an increase of approximately 1.4 office-based physicians per 10,000 people between 2000 and 2007. We

observe little variation over time in the national measures of Medicare population demographics, self-reported health status, or Median household income.

We present the regression model findings in Tables 6 through 9. Each model was run for the top BETOS and specialty groups of services separately. We report the findings with respect to the total ambulatory surgery volume in Table 6 and 7. Findings from the ASC market share models are shown in Tables 8 and 9.

After controlling for population demographic factors and provider supply, we generally found no statistically significant relationship between the number of ASCs and the total Medicare service per beneficiary, with the exception of pain management. Thus, we conclude that induced demand is not a driver of ASC volume.

For pain management, we found that each additional ASC per 100,000 people was associated with a 26 percent increase in the number of Medicare pain management services. (Although this effect seems large, it is important to consider that an additional ASC per 100,000 is equivalent to a 59 percent increase in the number of ASCs per capita from 2007.) While we cannot rule out that induced demand may have contributed to the growth in pain management services in ASCs, there is reason to believe multiple factors are involved in the observed growth. This service sector has grown rapidly across all ambulatory settings evaluated, and against a backdrop of increased focus on the importance of pain management both in the patient and provider communities. We are unable to separately identify any effects associated with physician and patient preference for ASCs. In addition, we found that each additional ASC per 100,000 people would increase ASC market share for colonoscopies and upper GI endoscopies by roughly 22 and 30 percent, respectively. Much smaller market share effects from an additional ASC were found for pain management (6%).

Although not shown, we generally found statistically significant time effects and that these effects were either consistent or increasing over time. These findings demonstrate significant temporal demand effects for the type of surgeries performed in ASCs, which are not captured by other variables in the models. These time effects may be capturing changes in technology over time as well as relative price changes between the HOPD and ASC.

Table 5. Trends in Growth of ASCs and State-level Characteristics

Variables	2000	2001	2002	2003	2004	2005	2006
ASCs per 100,000 pop	1.2	1.3	1.4	1.5	1.5	1.6	1.7
Short-term general hospitals per 100,000 pop	2.4	2.4	2.3	2.3	2.3	2.3	2.4
Office Based Physicians per 10,000 pop	16.8	17.5	17.5	17.9	18.0	18.5	18.2
Share Surgical Physicians	25%	24%	24%	24%	24%	23%	23%
% Pop Age 75 to 84	35%	35%	35%	35%	35%	35%	35%
% Pop Age 85+	12%	13%	13%	13%	13%	14%	14%
% Pop Male	42%	42%	42%	42%	42%	42%	42%
% Pop Hispanic	3%	3%	3%	3%	4%	4%	4%
% Pop African American	7%	7%	7%	7%	7%	7%	7%
% Pop 65+ Reporting Fair or Poor Health	15%	15%	15%	15%	15%	16%	15%
Medicare Disabled Share	13%	13%	14%	14%	15%	15%	15%
Median Household Income	\$50,284	\$49,540	\$48,828	\$48,960	\$48,845	\$49,079	\$49,725

Source: KNG Health Consulting analysis of Medicare, U.S. Census, and Area Resource File data.

Table 6. Estimated Effects of ASCs, Provider Supply, and State Characteristics on Total Medicare Services per 1,000 Beneficiaries by BETOS State and Year Fixed Effects Model: 2000-2006

Explanatory Variables	Eye procedure - cataract removal/lens insertion (P4B)	Endoscopy - colonoscopy (P8D)	Minor procedures - musculoskeleta l (P6B)	Endoscopy - upper GI (P8B)	Eye procedure - other (P4E)
ASCs per 100,000 pop	0.033	0.027	0.035	-0.035	-0.037
Short-term general hospitals per 100,000 pop	-0.019	0.005	-0.009	-0.014	-0.037
Office Based Physicians per 10,000 pop	-0.023	0.013	0.023**	0.021**	-0.020
Share Surgical Physicians	0.315	1.259	-0.900	2.08*	4.273**
% Pop Age 75 to 84	-1.256	0.821	2.870*	1.125	-4.948**
% Pop Age 85+	-10.248**	-2.551	-2.416	6.149**	5.985**
% Pop Male	-1.580	-7.964	13.02**	7.567	2.754
% Pop Hispanic	-1.083	-0.607	3.48**	1.620	-1.773
% Pop African American	-1.821	-5.803**	5.36**	-1.723	3.416*
% Pop 65+ Reporting Fair or Poor Health	0.000	-0.004	0.006	-0.007*	-0.007
Medicare Disabled Share	-1.425	0.650	1.031	1.104	-1.670
Median Household Income	-0.000	0.000	-0.000**	0.000	-0.000

Source: KNG Health Consulting analysis of Medicare, U.S. Census, and Area Resource File data. Excludes North and South Dakota.

Notes: Dependent variable is log of total number of services across ASC, HOPDs, and physician offices per 1,000 Beneficiaries beneficiaries. *Statistical significance at 10%; **Statistical significance at 5%

Table 7. Estimated Effects of ASCs, Provider Supply, and State Characteristics on Total Medicare Services per 1,000 Beneficiaries by Specialty
State and Year Fixed Effects Model: 2000-2006

Explanatory Variables	GI	Ophthalmology	Orthopedic	Pain Management	Dermatology
ASCs per 100,000 pop	0.006	0.000	-0.014	0.233**	-0.038
Short-term general hospitals per 100,000 pop	-0.004	-0.024**	-0.003	0.006	0.013
Office Based Physicians per 10,000 pop	0.010	-0.018*	0.023**	0.028	0.010
Share Surgical Physicians	1.312	2.230*	1.291	-5.143	2.896**
% Pop Age 75 to 84	2.307*	-3.209**	0.264	6.792	-0.304
% Pop Age 85+	-1.091	-0.818	-1.708	-6.345	4.249**
% Pop Male	1.812	-0.370	7.447**	18.388	9.759**
% Pop Hispanic	1.279	-0.959	-0.204	4.505	-7.204**
% Pop African American	-2.332	0.726	4.636**	3.520	3.575**
% Pop 65+ Reporting Fair or Poor Health	-0.001	-0.003	0.003	0.007	-0.003
Medicare Disabled Share	1.397	-1.415	-0.463	6.939**	0.696
Median Household Income	0.000	-0.000	-0.000**	-0.000**	-0.000**

Source: KNG Health Consulting analysis of Medicare, U.S. Census, and Area Resource File data. Excludes North and South Dakota.

Notes: Dependent variable is log of total number of services across ASC, HOPDs, and physician offices per 1,000 Beneficiaries beneficiaries. *Statistical significance at 10%; **Statistical significance at 5%

Table 8. Estimated Effects of ASCs, Provider Supply, and State Characteristics on ASC Market Share by BETOS
State and Year Fixed Effects Model: 2000-2006

Explanatory Variables	Eye procedure - cataract removal/lens insertion (P4B)	Endoscopy - colonoscopy (P8D)	Minor procedures - musculoskeleta l (P6B)	Endoscopy - upper GI (P8B)	Eye procedure - other (P4E)
ASCs per 100,000 pop	0.142**	0.195**	0.045**	0.268**	0.014**
Short-term general hospitals per 100,000 pop	0.004	0.013	-0.002	-0.034	0.007*
Office Based Physicians per 10,000 pop	-0.006	-0.004	0.004	0.007	0.005*
Share Surgical Physicians	1.4	-0.891	-0.925*	-10.3*	0.524
% Pop Age 75 to 84	-2.0*	1.3	0.801	9.8**	0.675*
% Pop Age 85+	1.5	2.0	-2.2**	-9.5	0.925**
% Pop Male	0.331	2.1	0.309	12.8	1.7**
% Pop Hispanic	1.2	2.8**	0.785**	11.1**	0.584
% Pop African American	1.1	-1.8*	0.334	5.1	0.660*
% Pop 65+ Reporting Fair or Poor Health	-0.002	-0.003	0.001	0.010	0.002
Medicare Disabled Share	-0.20	0.604	-1.4*	-11.4*	0.476
Median Household Income	-0.000	-0.000	-0.000	-0.000	0.000

Source: KNG Health Consulting analysis of Medicare, U.S. Census, and Area Resource File data.

Notes: Dependent variable is ASC services as a share of total number of services across ASC, HOPDs, and physician offices.

*Statistical significance at 10%; **Statistical significance at 5%

Table 9. Estimated Effects of ASCs, Provider Supply, and State Characteristics on ASC Market Share by Specialty
State and Year Fixed Effects Model: 2000-2006

Explanatory Variables	GI	Ophthalmology	Orthopedic	Pain Management	Dermatology
ASCs per 100,000 pop	0.198**	0.087**	0.020**	0.062*	0.005**
Short-term general hospitals per 100,000 pop	0.014*	0.007	0.001	-0.010	0.000
Office Based Physicians per 10,000 pop	-0.004	-0.006	0.001	0.029*	0.000
Share Surgical Physicians	-1.2*	0.210	0.093	-2.1	0.051*
% Pop Age 75 to 84	1.3	-1.2*	-0.159	0.365	0.019
% Pop Age 85+	2.0	-1.9**	-0.288	-2.5	0.004
% Pop Male	1.6	-2.2	0.455	3.0	-0.054
% Pop Hispanic	2.7**	-0.137	-0.131	-3.3**	-0.027
% Pop African American	-2.1**	-0.667	-0.127	3.7**	-0.020
% Pop 65+ Reporting Fair or Poor Health	-0.003	0.000	0.000	-0.004	0.000
Medicare Disabled Share	0.106	0.105	-0.281*	-7.5**	0.003
Median Household Income	-0.000	-0.000	-0.000	-0.000**	-0.000

Source: KNG Health Consulting analysis of Medicare, U.S. Census, and Area Resource File data.

Notes: Dependent variable is ASC services as a share of total number of services across ASC, HOPDs, and physician offices.

*Statistical significance at 10%; **Statistical significance at 5%

VIII. Discussion

We conducted a comprehensive study of the growth factors for ASCs. Although our qualitative analyses, including literature review and expert interviews, covered Medicare and non-Medicare populations, we were primarily limited to Medicare data in conducting our quantitative analyses. We highlight the major study findings below.

- Growth in surgeries performed in ASCs parallels the historic shift away from hospital inpatient surgeries toward outpatient settings.
- A number of factors account for the growth in ASCs including population health guidelines for disease screening (e.g., colorectal cancer screening), shift in site of services away from the hospital outpatient setting to ASCs, payer incentives to pay for care in the most cost-effective setting, demographic changes, and consumer and physician preferences.
- Much of the growth in outpatient surgeries was made possible by technological improvements that have allowed for faster patient recovery times. These advances include improved surgical techniques, anesthesia, and pharmaceuticals to better manage post-operative pain.
- Patients may prefer ASCs because they offer lower copayments, more convenient locations, shorter waiting times, and easier scheduling for patients.
- Physicians report preferring to treat patients in an ASC because it provides an opportunity to better control staffing decisions, equipment selection decisions, and process and scheduling decisions (FASA, 2007). The ability to manage their work environment, along with short turnaround times and specialized focus by nurses and other support staff at ASCs (Haugh, 2006; AHA, 2006) creates the potential for higher professional revenue through increased productivity. Physicians with an ownership interest in the facility may derive a portion of their income through ownership equity.
- Eye procedures represent the largest share of Medicare spending for ASCs, but these services have experienced the slowest growth since 2000. Colonoscopy procedures increased by 15 percent per year, on average.
- Colonoscopy and upper gastrointestinal endoscopic (GI) procedures accounted for almost a third of Medicare ASC spending growth between 2000 and 2007. This finding is consistent with growing demand for essential cancer and other screening services among Medicare beneficiaries.
- Almost all of the growth in Medicare spending for ASC services was due to growth in the number of services per beneficiary. Medicare population growth and price changes account for a small but positive amount of the growth. The average price of procedures performed in the ASCs fell by around 11 percent between 2000 and 2007, reflecting the growing share of screening services provided by ASCs.

- We estimate that 70 percent of the growth in ASC service volume per Medicare beneficiary between 2000 and 2007 can be attributed to ASCs capturing market share from HOPDs (also referred to as a shift in site of service). The remaining 30 percent is attributed to overall growth in outpatient surgical services across all settings.
- We find little evidence that induced demand is a driver of ASC service volume. After controlling for population demographic factors and provider supply, we generally find no statistically significant relationship between the number of ASCs and the total Medicare service volume per beneficiary. For pain management, we are not able to reject the hypothesis of induced demand, although physician and consumer preferences for ASCs along with treatment protocols that require multiple injection procedures may contribute to the finding that the number of ASCs is positively correlated with the total volume of pain management services.

The number of ASCs has grown significantly since 2000, along with the number of Medicare services provided in these facilities. We found that most of the growth in Medicare services since 2000 resulted from a movement of services from the HOPD to the ASC. Almost 60 percent of the growth in Medicare spending for ASCs since 2000 was due to growth in cataract surgeries, colonoscopies, and upper gastrointestinal procedures. These procedures are strongly associated with age and represent essential services to Medicare beneficiaries. These findings along with the observation that ASCs have been paid less than HOPDs, on average, suggest that the Medicare program may have spent less as a result of the movement of services to ASCs.

Despite the strong growth over the last several years, increases in the number of Medicare-certified ASCs have slowed recently. Whether this trend will continue is uncertain, but a number of factors point to this possibility. In the short term, the economic environment is likely to discourage the establishment of new ASCs. The transition to a new Medicare payment system is reducing payment for some high-volume services, while rates are increasing for many low volume services. Although the net effect of these reimbursement changes on ASC growth may be mixed, the large differential between Medicare payments to ASCs and HOPDs may have altered the incentives for development of ASCs. Even more fundamentally, physician supply constraints may limit the growth rates in future years.

References

- A Report by the American Society of Anesthesiologists Task Force on Pain Management. 1997. "Practice Guidelines for Chronic Pain Management." *Anesthesiology*. April, 1997. Vol 86, no 4, p 995
- American Academy of Ophthalmology. "The History of Cataract Surgery." AAO. Accessed at http://www.fao.org/what/heritage/exhibits/online/cataract/21st_century.cfm
- American Academy of Ophthalmology. 2006. "Cataract in the Adult Eye, Preferred Practice Pattern; Prepared by the American Academy of Ophthalmology Cataract and Anterior Segment Panel". Second Printing, January 2008.
- Agency for Healthcare Research and Quality. 2003. "Ambulatory Surgery in US Hospitals," HCUP Fact Book 9.
- Ambulatory Surgery Center Association. 2008. "Medicare ASC Payment Rates: An Industry in the Midst of Change." Presentation at the Medicare Payment Advisory Commission. December 12.
- American Hospital Association. 2006. "The Migration of Care to non-hospital Settings: Have Regulatory Structures Kept Pace with Changes in Care Delivery?" Trendwatch, July 2006.
- Center for Disease Control. Colorectal (Colon) Cancer What CDC is Doing. Accessed at http://www.cdc.gov/cancer/colorectal/what_cdc_is_doing/
- Cheung, N, Wong TY. 2007. "Obesity and Eye Diseases". *Surv Ophthalmol*. Mar-Apr; 52(2): 180-95
- Centers for Medicare and Medicaid Services, Office of the Actuary, National Health Statistics Group and U.S. Department of Commerce, Bureau of Economic Analysis; and U.S. Bureau of the Census, "National Health Expenditures Tables, 2008."
- Centers for Medicare and Medicaid Services. Colorectal Cancer Screening – Provider Resources Accessed at http://www.cms.hhs.gov/ColorectalCancerScreening/02_Provider%20Resources.asp#TopOfPage
- Centers for Medicare and Medicaid Services. Colorectal Cancer Screening Flexible Sigmoidoscopy and Colonoscopy Coinsurance. MLM Matters. Accessed at <http://www.cms.hhs.gov/MLNMattersArticles/downloads/MM5387.pdf>
- Centers for Medicare and Medicaid Services. Non-Application of Deductible for Colorectal Cancer Screening Tests. Accessed at <http://www.cms.hhs.gov/Transmittals/Downloads/R1004CP.pdf>
- Chukmaitov, AS, Menachemi N, Brown LS, Saunders C, Brooks RG. A Comparative Study of Quality Outcomes in Freestanding Ambulatory Surgery Centers and Hospital-Based Outpatient

Departments: 1997-2004. Health Research and Educational Trust, 2007.

Congressional Budget Office. 2008. "Technological Change and the Growth of Health Care Spending." CBO: January 2008.

Congressional Budget Office, Testimony. 2008. Statement of Peter R Orszag, Director Growth in Health Care Costs, before the Committee on the Budget, United States Senate, January 31, 2008. CBO: January 2008.

Cooper GS, Yuan Z, Chak A, Rimm AA. 2002. "Association of prediagnosis endoscopy with stage and survival in adenocarcinoma of the esophagus and gastric cardia" *Cancer*. 2002 Jul 1;95(1):32-8.

Cooper GS, Kou TD, Wong RC. 2009. Use and impact of early endoscopy in elderly patients with peptic ulcer hemorrhage: a population-based analysis. *Gastrointest Endosc*. 2009 Mar 27. Epub

Cram MF, Inadomi J, et al. 2003. "The Impact of a Celebrity Promotional Campaign on the Use of Colon Cancer Screening." *Archives of Internal Medicine*. 163: pp1601-1605.

Cutler DM. 2005. "Technology, Health Costs, and the NIH." Paper prepared for the National Institutes of Health Economics Roundtable on Biomedical Research. September 2005.

Desai MS. 2008. "Office-based anesthesia: new frontiers, better outcomes, and emphasis on safety," *Curr Opin Anaesthesiol*. 2008 Dec;21(6):699-703.

Deutsche Bank Securities Inc. 2008. Ambulatory Surgery Centers: Annual Survey Shows Growth Continues to Slow. February 4, 2008. Deutsche Bank.

FASA. "Physician-Led Ambulatory Surgical Centers: Vital To Meeting The Surgical Needs Of Tomorrow." February 2007.

Haugh R.2006. "Competition keeps getting hotter for ambulatory surgery," *Hosp Health Netw*. 2006 Oct;80(10):68-70, 72, 2.

HEDIS. 2009. 2009 Summary Table of Measures, Product Lines and Changes Current Procedural Terminology 2008 American Medical Association HEDIS 2009, Vol 2

Kaiser Family Foundation and Health Research and Educational Trust, "Employer Health Benefits 2008 Annual Survey," 2008.

Keehan S, Sisko A, Truffer C, Smith S, Cowan C, Poisal J, Clemens MK. 2008. "Health spending projections through 2017: the baby-boom generation is coming to Medicare," *National Health Expenditure Accounts Projections Team, Health Aff (Millwood)*. 2008 Mar-Apr;27(2):w145-55. Epub 2008 Feb 26.

Kozak LJ, McCarthy E, Pokras R. 1999. "Changing patterns of surgical care in the United States, 1980-1995," *Health Care Finance Rev*. Fall;21(1):31-49.

Lynk WJ, Longley CS. 2002. "The Effect of Physician-owned Surgicenters on Hospital Outpatient

Surgery," Health Aff (Millwood). Jul-Aug;21(4):215-21.

Manchikanti L, Hirsch JA. 2007. "Issues in health care: interventional pain management at the crossroads," Pain Physician. Mar;10(2):261-84. Review. Erratum in: Pain Physician. 2007 Jul;10(4):600.

Meara E, White C, Cutler DM, "Trends in medical spending by age, 1963-2000," Health Aff (Millwood). 2004 Jul-Aug;23(4):176-83.

Medical Group Management Association. 2006. "Ambulatory Surgical Center Performance Survey." Washington, DC: MGMA

Medicare Payment Advisory Commission testimony by Ron Castellanos MD, December 4, 2008 p 120-121 of transcript.

Medicare Payment Advisory Commission. 2006. Further analyses of Medicare procedures provided in multiple ambulatory settings: An introduction. October 2006. Washington, DC: MedPAC

Medicare Payment Advisory Commission. 2006b. Report to the Congress: Physician-Owned Specialty Hospitals Revisited. Washington, DC: MedPAC

Medicare Payment Advisory Commission. 2008. A Data Book: Healthcare Spending and the Medicare Program. June 2008. Washington, DC: MedPAC

Medicare Payment Advisory Commission. 2009. Report to the Congress: Medicare Payment Policy. March 2009. Washington, DC: MedPAC

National Center for Health Statistics. 2006. "Health, United States, 2006 With Chartbook on Trends in the Health of Americans." Hyattsville, MD:NCHS

National Institutes for Health. "New Directions in Pain Research: I program announcement". September 4, 1998. PA-98-102

National Cancer Institute. NCI. Fact Sheet: Colorectal Cancer Screening. Accessed at <http://www.cancer.gov/cancertopics/factsheet/Detection/colorectal-screening>

NCI SEER. SEER Stat Fact Sheets Cancer: Colon and Rectum. Accessed at <http://seer.cancer.gov/statfacts/html/colorect.html>

NEI. "Eye Health Needs of Older Adults - Literature Review," National Eye Health Education Program Five-Year Agenda 2006, as viewed on www.nei.nih.gov/nehep/research/The_Eye_Health_needs_of_Older_Adults_Literature_Review.pdf

NEI. 2004. "Summary of Eye Disease Prevalence Data," April 2004, as viewed May 2009 on the National Eye Institute's website http://www.nei.nih.gov/eyedata/pbd_tables.asp

- Newhouse, JP. 1992. "Medicare Care Costs: How Much Welfare Loss?" *Journal of Economic Perspectives*, vol 6, No. 3 (Summer 1992), pp 3-22.
- NIH. Cancer Advances in Focus Colorectal Cancer. Accessed at <http://www.cancer.gov/cancertopics/cancer-advances-in-focus/colorectal.pdf>
- O'Donnell BD, Iohom G. 2008 "Regional anesthesia techniques for ambulatory orthopedic surgery," *Curr Opin Anaesthesiol*. Dec;21(6):723-8.
- Poole EL. 1999. "Ambulatory surgery: the growth of an industry," 527: *J Perianesth Nurs*. 1999 Aug;14(4):201-6.
- Press Ganey Associates, Inc. 2008. "Outpatient Pulse Report: Patient Perspectives on American Health Care."
- RAND 2008. "Medicare Payment Differentials across Ambulatory Settings." Paper prepared for Assistant Secretary for Planning and Evaluation, HHS. July 2008.
- Reinhardt UE. 2003. "Does the Aging of the Population Really Drive the Demand for Health Care?" *Health Affairs*. Vol 22 no 6, pg 27-39.
- Rex DK, Johnson DA, Anderson JC, Schoenfeld PS, Burke CA, Inadomi JM. 2009. "American College of Gastroenterology Guidelines for Colorectal Cancer Screening 2008." *The American Journal of Gastroenterology*. 2009: p 739
- Rosenberg EA, Sperazza LC. 2008. "The visually impaired patient," *Am Fam Physician*. May 15;77(10):1431-6.
- Saaddine JB, Honeycutt AA, Narayan KM, Zhang X, Klein R, Boyle JP. 2008. "Projection of diabetic retinopathy and other major eye diseases among people with diabetes mellitus: United States, 2005-2050," *Arch Ophthalmol*. Dec;126(12):1740-7.
- Siddiqui A, Pena Sahdala HN, Nazario HE, Mahgoub A, Patel M, CIPHER D, Spechler S. 2009. "Obesity Is Associated with an Increased Prevalence of Advanced Adenomatous Colon Polyps in a Male Veteran Population." *Digestive Diseases and Sciences*. April 28.
- Singh H, Poluha W, Cheung M, Choptain N, Baron KI, Taback SP. 2008. "Propofol for sedation during colonoscopy." *Cochrane Database of Systematic Reviews* 2008, Issue 4. Art. No.: CD006268. DOI: 10.1002/14651858.CD006268.pub2.
- Smith SD, Heffler SK, Freeland MS. 2000. "The Impact of Technological Change on Health Care Cost Increases: An Evaluation of the Literature." Working paper.
- Strope SA, Daignault S, Hollingsworth JM, Wei JT, Hollenbeck BK. 2008. "Medicare reimbursement changes for ambulatory surgery centers and remuneration to urological physician-owners," *J Urol*. Sep;180(3):1070-4. Epub 2008 Jul 17.
- Strunk BC, Ginsburg PB. 2002. "Aging plays limited role in health care cost trends," *Data Bull*

(Cent Stud Health Syst Change). Sep;(23):1-2.

The American Pain Foundation. "National Pain Care Policy Act of 2009: S. 660 Bill Summary." Accessed at <http://www.painfoundation.org/Action/NPCPA2009Summary.pdf>

The American Pain Foundation. "Pain Facts & Figures." Accessed at <http://www.painfoundation.org/page.asp?file=Newsroom/PainFacts.htm>

The American Pain Foundation. "Treatment Options: A Guide for People Living with Pain." Accessed at <http://www.painfoundation.org/Publications/TreatmentOptions2006.pdf>

The Joint Commission. "SpeakUp: What You Should Know About Pain Management." Accessed at http://www.jointcommission.org/PatientSafety/SpeakUp/Speak_up_pain_managment.htm

Thorpe KE. 2006. "Factors accounting for the rise in health-care spending in the United States: the role of rising disease prevalence and treatment intensity," Public Health. 2006 Nov;120(11):1002-7. Epub 2006 Oct 9.

Thorpe KE, Florence CS, Joski P. 2004. "Which medical conditions account for the rise in health care spending?" Health Aff (Millwood). Jul-Dec;Suppl Web Exclusives:W4-437-45.

Thorpe, Kenneth E. and Lydia Ogden. 2008. "What Accounts For The Rise In Health Care Spending? Rising Rates of Obesity, Increases in Chronic Disease Prevalence, and New Technology Are Critical Drivers in Spending Increases," Institute for Advanced Policy Studies, August 2008.

US Department of Health and Human Services, Centers for Disease Control and Prevention, National Center for Health Statistics. 2008 "Health, United States, 2008." DHHS Publication No. 2009-1232.

US Department of Health and Human Services, Centers for Disease Control and Prevention. 1996. "Physical activity and health: A report of the Surgeon General." Atlanta, GA: CDC. Available from: <http://www.cdc.gov/nccdphp/sgr/sgr.htm>.

Weintraub, JM, Willet, WC, Rosner, B, Colditz, GA, Seddon, JM, Hankinson, SE. 2002. A Prospective Study of the Relationship Between Body Mass Index and Cataract Extraction Among US Women and Men. International Journal of Obesity. December 2002, Vol 26, No. 12: 1588-1595

Wilkins T, Reynolds PL. 2008. Colorectal Cancer: A Summary of the Evidence for Screening and Prevention. Am Fam Physician, 2008 Dec 15; 78(12): 1385-92

Winter A. 2003. "Comparing the mix of patients in various outpatient surgery settings," Health Aff (Millwood). Nov-Dec;22(6):68-75.

Written testimony of Kenneth E. Thorpe, PhD, Robert W. Woodruff Professor and Chair
Department of Health Policy and Management, Emory University, before the U.S. Senate
Committee on Health, Education, Labor, and Pensions Hearing on Prevention and Public

Health: The Key to Transforming our Sickcare System, December 10, 2008

Xirasagar S, Lin HC. 2005. "Effects of payment incentives, hospital ownership and competition on hospitalization decisions for ambulatory surgical procedures," Health Policy. Mar;76(1):26-37. Epub 2005 Jun 1.

Detailed Methods Appendix

This study reports on the factors of growth for ambulatory surgical centers. The quantitative analysis consists of four components:

- Descriptive analysis
- Decomposition of Medicare-related growth in ASCs into a set of broad factors
- Estimates of the impact of shift in site of ambulatory surgical care on ASC Medicare growth
- Regression modeling to determine the effects of specific factors on ASC Medicare use

This Appendix provides a detailed description of the data sources and technical approach for each of the components.

1. Data Sources

We utilized multiple data sources to complete this study. A description of these data sources and how they were used in the study is provided in the table below.

The principal data sources, which we used to measure the growth in the use of ASCs in the Medicare was the Physician/Supplier Procedure Summary Master File (PSPS). The PSPS file, which is produced by the Centers for Medicare and Medicaid Service, summarizes all Medicare Part B carrier (and DMERC) claims for Medicare fee-for-service enrollees. The summarized fields include total submitted services and charges, total allowed services and charges, total denied services and charges, and total payment amounts. The PSPS is an annual file and contains information on ASC services and physician-billed services provided in ambulatory care settings, including physician offices and hospital outpatient departments. We used the PSPS files for the years 2000 through 2007 (the most recent year for which data are available at the time of this report).

The NSAS is a survey produced by the CDC, National Center for Health Statistics. The NSAS is a national survey of ASC care provided in hospital-based and freestanding facilities. Data are available on patient, expected sources of payment, and patient diagnoses and procedures performed. The survey was initially fielded annually and collected data for 1994 through 1996. After a period of inactivity, the survey was fielded again 2006. We use the 1996 and 2006 survey data from the NSAS.

Primary Data Sets and their Purpose for ASC Study		
Data Sources	Description	Use
PSPS File	CMS produces the PSPS file, which is a summary of all Part B Carrier (and DMERC) claims. The summarized fields include total submitted services and charges, total allowed services and charges, total denied services and charges, and total payment amounts. The PSPS is an annual file and contains information on ASC services and physician-billed services provided in ambulatory care settings.	Multiple years of the PSPS file were used to the construction estimates of ASC use at the state and national level.
Provider of Service	The Provider of Services (POS) Extract is created from the Online Survey and Certification Reporting System (OSCAR) database. These data include information on Medicare-approved providers, including ASCs and hospitals.	The POS provided information on number of Medicare-certified ASCs and HOPD as well as the types of services provided.
Area Resource File (ARF)	The Health Resources and Service Administration produces the ARF which collects data from more than 50 sources, including the: AMA, AHA, US Census Bureau, CMS, BLS, and the NCHS. The ARF contains information on health facilities including Ambulatory Surgical Centers, health professions, resource scarcity measures, health status, economic activity, health training programs, and socioeconomic and environmental characteristics.	The ARF provided important resources necessary for the state level regression analysis.
Behavioral Risk Factor Surveillance System (BRFSS)	The BRFSS from the CDC is a state-based system of health surveys that collects information on health risk behaviors, preventive health practices, and healthcare access primarily related to chronic disease and injury.	This source provided the basis for much of the descriptive analysis of ambulatory surgery in the US as well as the actuarial projections of future need
Census Data	US Census Bureau provides annual projections based on the most recent census. The current projections rely on Census 2000 and contain information about the 115.9 million housing units and 281.4 million people covered in that census. Detailed projected demographic statistics are available by age, race, and gender.	

2. Methods

a. Decomposition of Medicare-related Growth Factors

We decomposed the growth of Medicare spending for ASCs into broad categories following an approach similar to the “residual” approach used by CMS’s Office of the Actuary to examine the contribution of technological change to overall healthcare spending growth.¹³ This approach recognizes that Medicare spending can be estimated as the product of:

1. Medicare FFS population (Pop)
2. Average number of services (NOS) per beneficiary
3. Average relative weight (or comparative value) (RW)
4. Medicare prices (payment per relative weight) (Pr)

The decomposition analysis is based on the following relationship:

$$AC_t = Pop_t * (\sum_i NOS_{it}) / Pop_t * (Pr_{avg} * (\sum_i NOS_{it} * RW_{i,avg})) / (\sum_i NOS_{it}) * (Pr_t * (\sum_i NOS_{it} * RW_{it}) / (Pr_{avg} * (\sum_i NOS_{it} * RW_{i,avg}))),$$

where AC equals Medicare allowed charges, Pop equals Medicare FFS population, NOS equals number of services, RW equals relative weight, Pr equals Medicare price or reimbursement level, t equals year, i equals HCPCS, and avg. is average.

We define each component of the formula in the table below.

Components of Allowed Charges Formula

Components	Formula
Medicare FFS Enrollment	Pop_t
Number of Service per Beneficiary	$(\sum_i NOS_{it}) / Pop_t$
Average RW per Service	$Pr_{avg} * (\sum_i NOS_{it} * RW_{i,avg}) / (\sum_i NOS_{it})$
Medicare Prices	$Pr_t * (\sum_i NOS_{it} * RW_{it}) / (Pr_{avg} * (\sum_i NOS_{it} * RW_{i,avg}))$

Until recently there were no Medicare relative weights for ASCs. Instead, ASC services were grouped into a nine payment categories with each group having a separate payment amount. We constructed relative weights by constructing an average payment amount using the 2006 distribution of ASC services by payment group. Although the Medicare program changes Medicare prices for groups of ASC services, this approach allows us to separate out the effects of a change in the mix of

¹³ Smith S, Heffler SK, Calfo S et al. National health projections through 2008. Health Care Financing Review. 1999;21:211-235.

services to either more or less resource intensive services from changes in Medicare price levels for ASC services.

We constructed each component show in Table X for each analysis year and calculated the percent of growth in allowed charges due to each component based on the following formula:

$$\% \Delta AC_{t-(t-1)} \approx \% \Delta Pop + \% \Delta NOS/Beneficiary + \% \Delta \text{Relative Weight} + \% \Delta \text{Medicare Prices}.$$

Where $\% \Delta$ is the percent change in a variable. The percent of growth associated with, for example, Medicare FFS population growth is calculated as $\% \Delta Pop_{t-(t-1)} / \% \Delta AC_{t-(t-1)}$, where $\% \Delta AC_{t-(t-1)}$ is derived from the sum of the individual percent changes as shown in the formula above. As a result of this decomposition analyses, we will report the percent of national growth in ASC services due to changes in population, Medicare prices, number and relative weight.

For this analysis, the Medicare frequency of and allowed charges for ASCs services were developed with the Physician/Supplier Procedure Summary Master File. We identified ASC services in the PSPS based on codes for type of service, place of service, and specialty. Type of Service = "F", Place of Service = "24", and Specialty="49".

a. Shift in Site of Ambulatory Care Model

We estimated the amount of growth in Medicare ASC procedures due to a shift in site of service using the PSPS. We estimated effects of a shift in site of service on ASC service growth overall and at the BETOS level. To implement the approach we estimated the distribution of where services were performed in a base year and projected the number of services in a following year if the distribution across settings had remained the same. Put another way, we allowed an ASC service to grow at the same rate as across all ambulatory settings and then determined the extent to which this "expected" growth rate differed from the actual growth rate. We attributed any difference between the expected and actual growth rates as the growth due to a shift in site of service.

Algebraically, the shift in site of service calculation required the construction of the following measures:

- ASC Actual Growth for Procedure $i = X_{ASC,i,t+1} - X_{ASC,i,t}$
- ASC Share of Procedure i in Period $t = X_{ASC,i,t} / \sum_j X_{jit}$, where $j = \{ASC, HOPD, Physician Office\}$
- ASC Expected Volume in Period $t+1 = \sum_j X_{jit+1} * (X_{ASC,i,t} / \sum_j X_{jit}) = \tilde{X}_{ASC,i,t+1}$
- ASC Growth Attributed to Shift in Ambulatory Site of Service = $\sum_i (X_{ASC,i,t+1} - \tilde{X}_{ASC,i,t+1}) / \sum_i (X_{ASC,i,t+1} - X_{ASC,i,t})$,

where X is the volume of services, i is procedure, t is time period, and j is ambulatory setting.

We measured volume across all ambulatory sites of services using the 2007 ASC relative weights derived in the cost decomposition analysis. We applied these weights to value services performed in the hospital outpatient setting and physician offices. The PSPS does not include claims submitted by HOPD. It does, however, include physician-billed claims for service performed in an outpatient setting. We used these services to estimate the number of procedures performed in HOPDs.

b. State-Level, Time-Series Regression Model

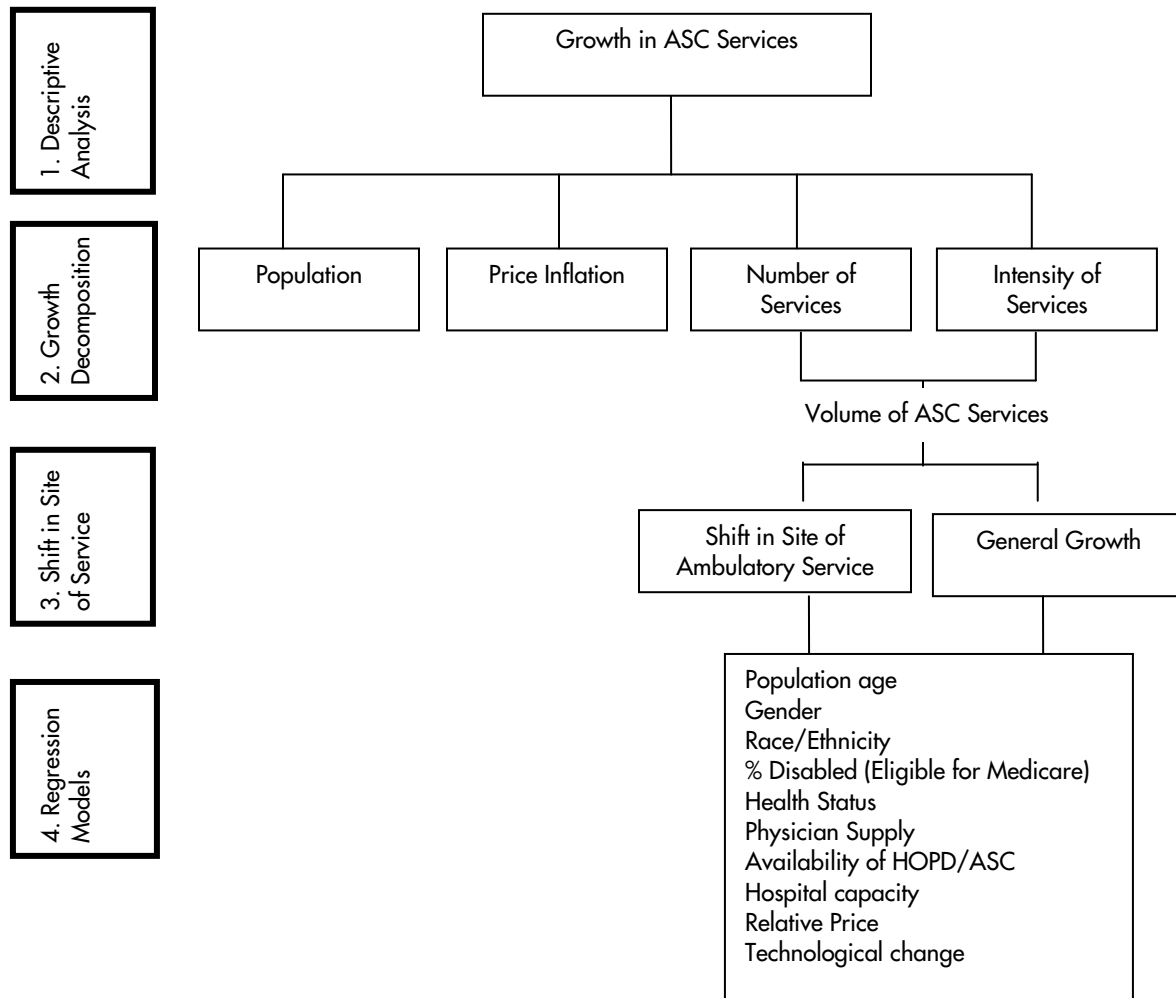
The decomposition of growth and site-of-service analysis allowed us to make statements about the contributions to ASC growth of some broad factors, such as growth in population, number of services per beneficiary, and shifts in site of service. To be able to quantify the contribution to growth of specific demand and supply factors, we used regression analysis. It is worth emphasizing that a regression-based approach to assessing the contributions to growth in ASCs has many challenges, including issues of omitted variable bias (how can you capture all relevant demand and supply factors?) and difficulty in quantifying technological change.

That said, we estimated state-level regression models using cross-sectional, time-series data. We regressed Medicare services per beneficiary against demand- and supply-side factors. The data source for the Medicare service counts were the PSPS files. The dependent variable, volume of procedures, is not specific to ASCs but, instead, included volume for all ambulatory settings. Technological change was captured through a series of time dummy variables.

We estimated a second state-level regression model where the dependent variable is the share of Medicare procedures done in the ASC. This second model relates to shift in site of service and included those supply-side variables identified as important for determining whether a procedure is done in an ASC or another ambulatory setting. Notice that this two-step strategy to the regression modeling tracks with our conceptual model.

How the different methods and models fit together

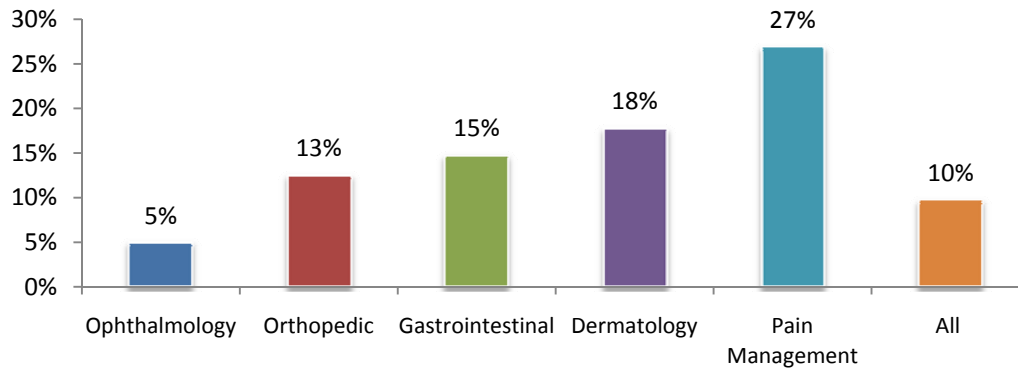
Figure 1.
Relationship between ASC Study Models and Analyses



Appendix Charts: Results by Specialty

Growth in Medicare Allowed Charges per Beneficiary for ASCs by Specialty from 2000 to 2007

Source: KNG Health analysis of Medicare PSPS files.



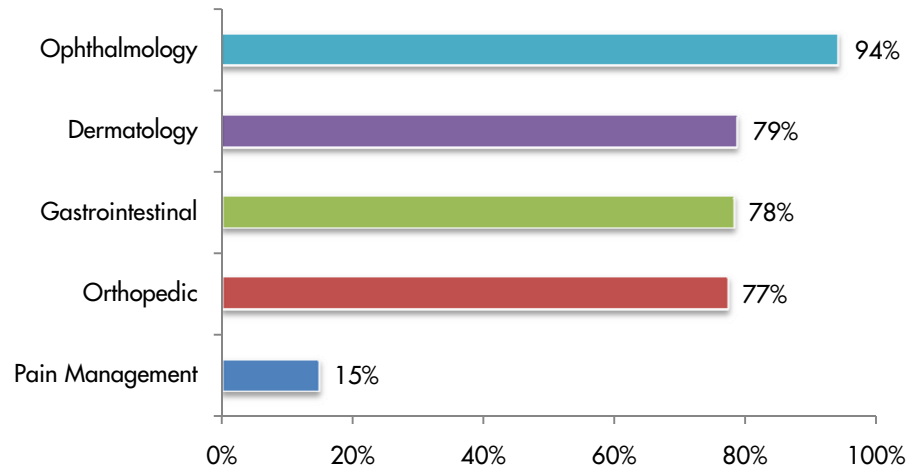
Contribution to Medicare ASC Growth in Allowed Charges by Specialty

Specialty	Contribution to Growth Between:			
	2000-07	2000-03	2003-06	2006-07
Gastrointestinal	35%	37%	34%	37%
Ophthalmology	29%	35%	27%	10%
Pain Management	17%	13%	19%	28%
Orthopedic	8%	8%	9%	7%
Dermatology	4%	3%	7%	-3%
Other	6%	4%	4%	21%
Total	100%	100%	100%	100%

Source: KNG Health analysis of Medicare PSPS files.

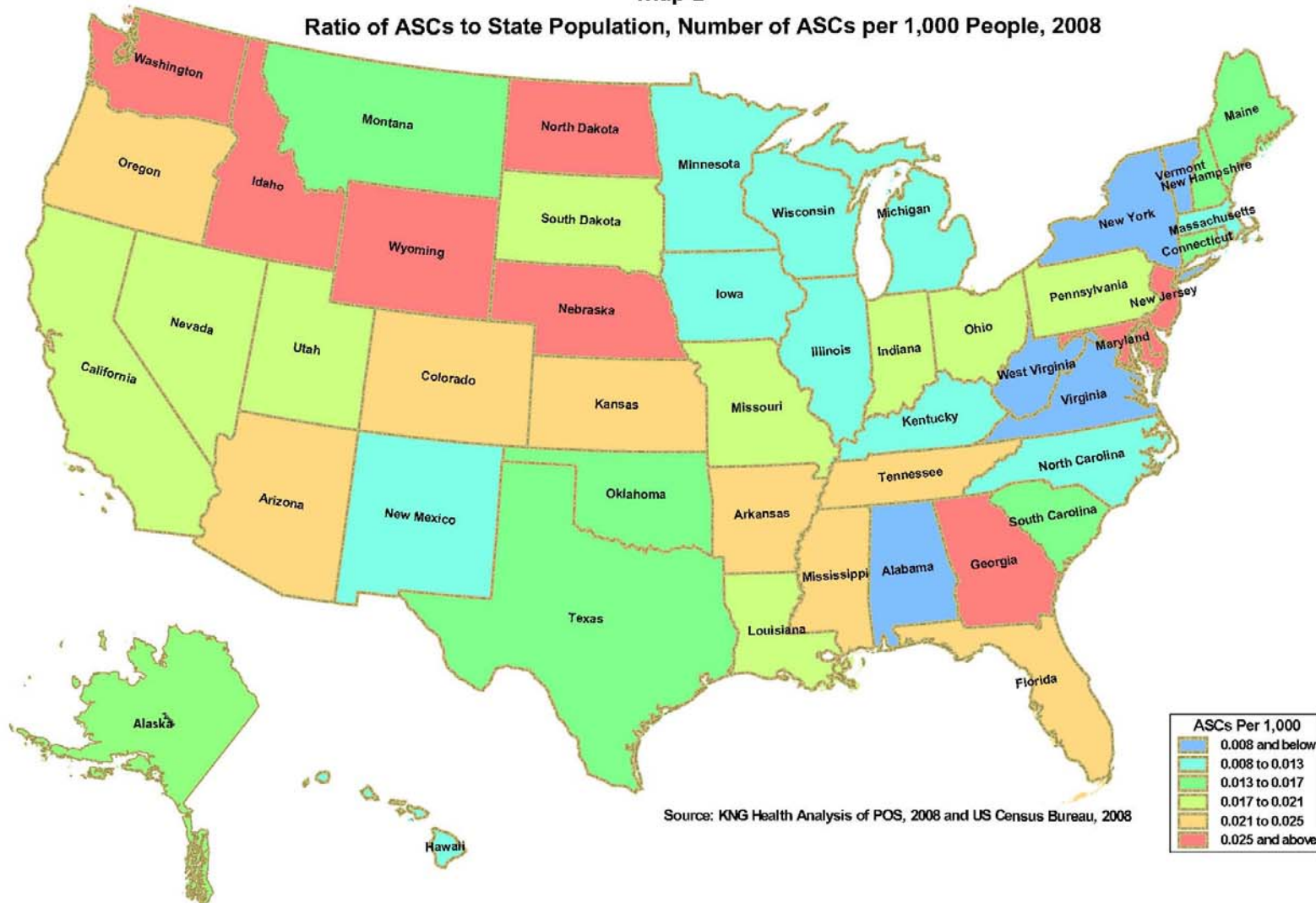
Growth in Medicare ASC Allowed Services from a Shift in Site of Service

Source: KNG Health analysis of Medicare PPS files.

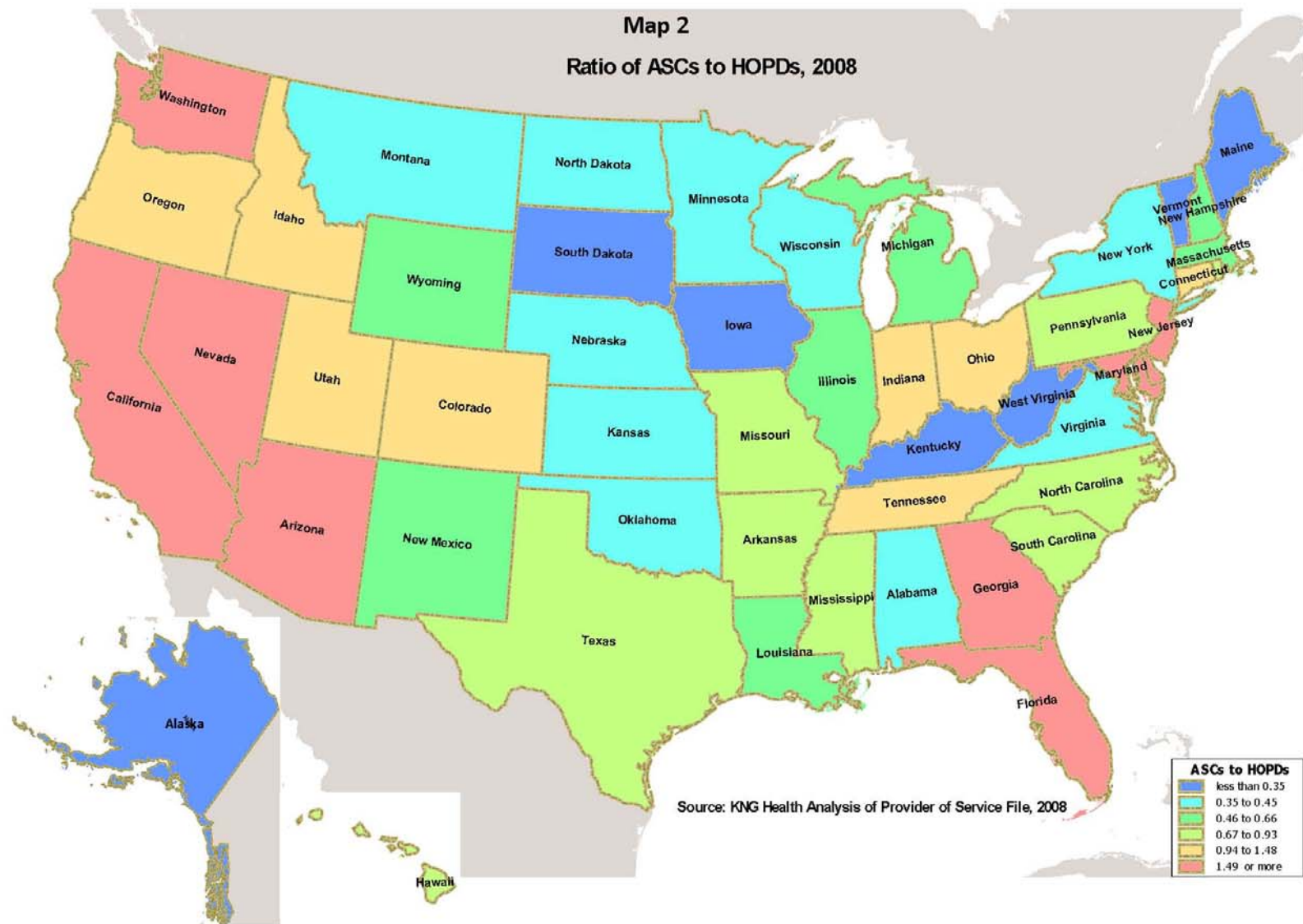


Map 1

Ratio of ASCs to State Population, Number of ASCs per 1,000 People, 2008

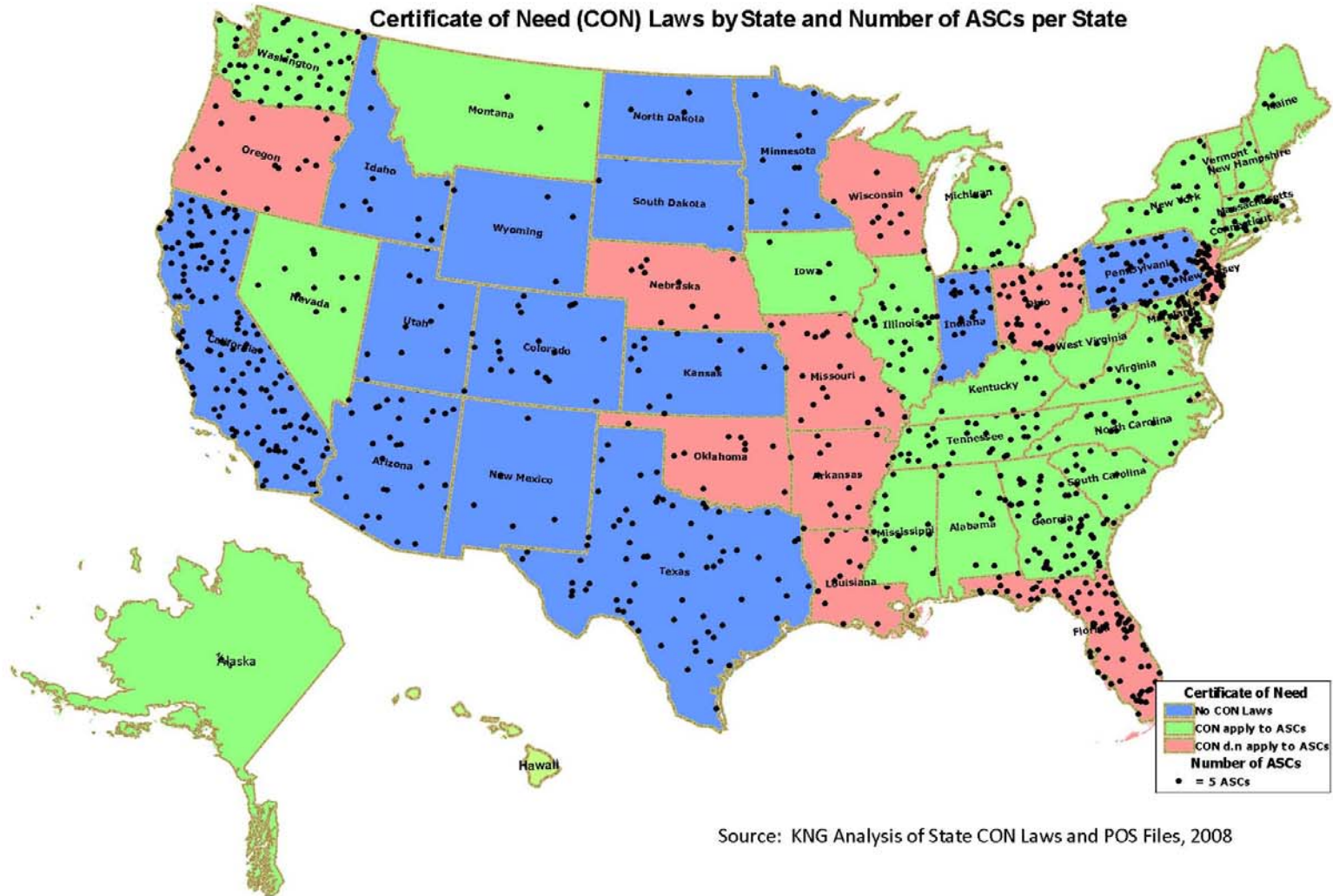


Source: KING Health Analysis of POS, 2008 and US Census Bureau, 2008



Map 3

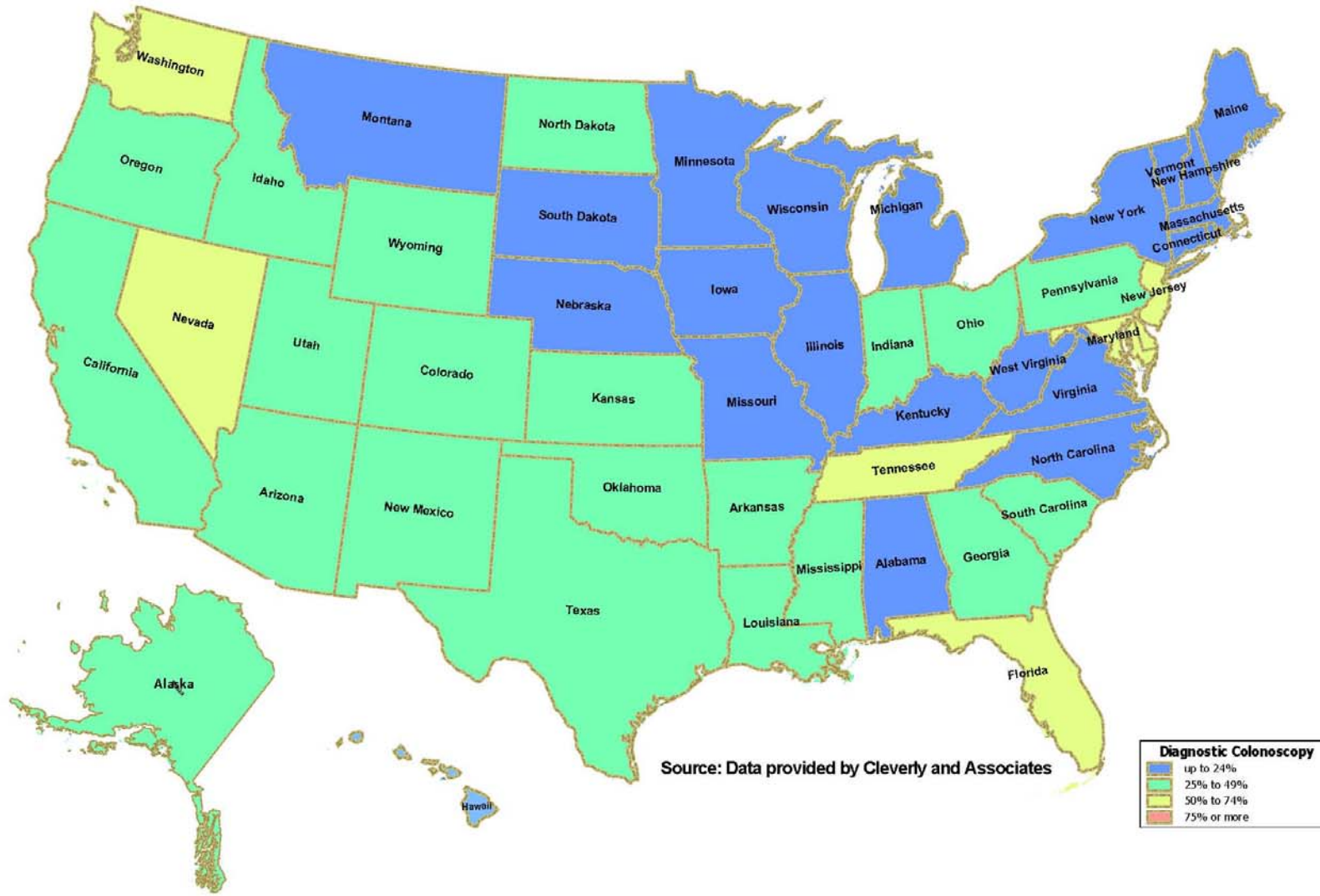
Certificate of Need (CON) Laws by State and Number of ASCs per State



Source: KNG Analysis of State CON Laws and POS Files, 2008

Note: In Missouri, CON may be required if ASC includes major medical equipment over \$1m. Las Vegas, Reno and all other counties over 100k are exempt from CON.

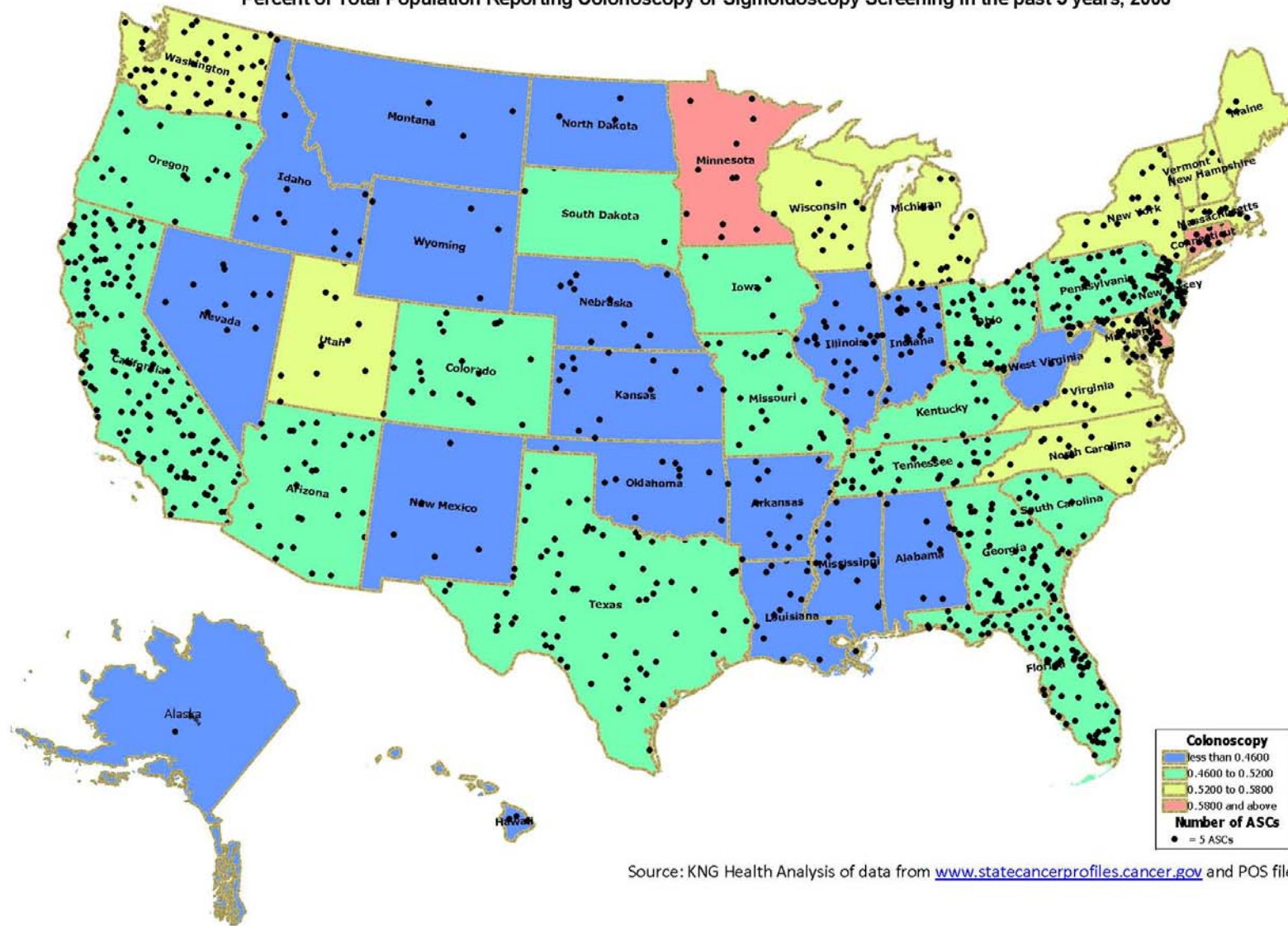
Map 4
Estimated Percentage of Diagnostic Colonoscopy Performed in ASC Setting in 2006, CPT 45378



Source: Data provided by Cleverly and Associates

Map 5

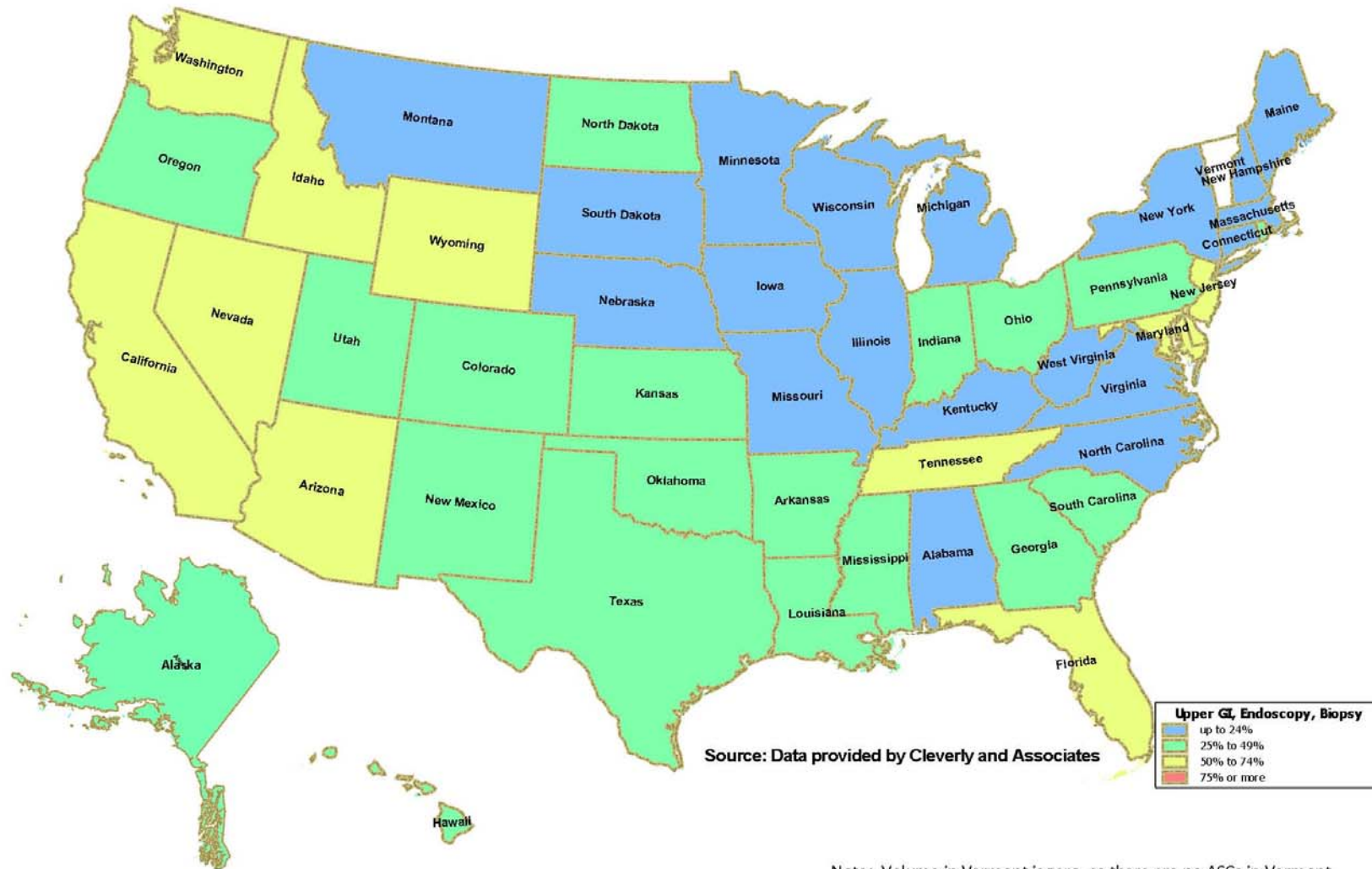
Percent of Total Population Reporting Colonoscopy or Sigmoidoscopy Screening in the past 5 years, 2006



Source: KNG Health Analysis of data from www.statecancerprofiles.cancer.gov and POS files.

Map 6

Estimated Percentage of Upper GI, Endoscopy, & Biopsy Procedure Performed in ASC Setting in 2006, CPT 43239



Note: Volume in Vermont is zero, as there are no ASCs in Vermont.

Map 7

Average Annual ASC Growth Rate in Allowable Charges, 2000 to 2007

