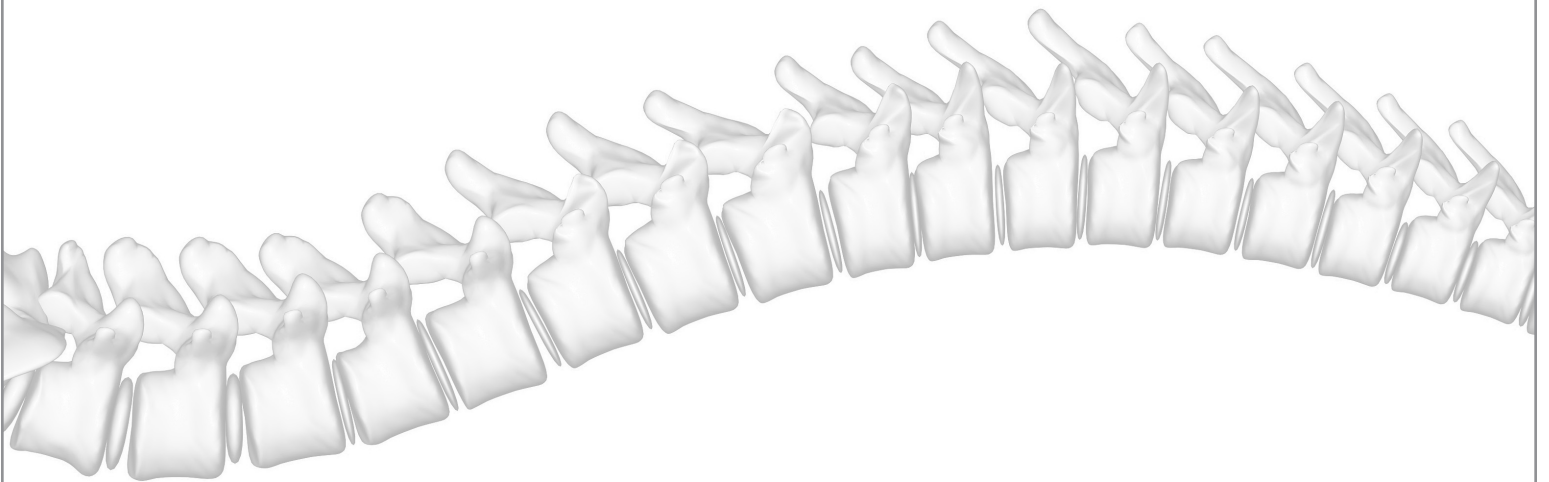


DEFINING COMPREHENSIVE SPINE CARE

ORGANIZING FOR SUCCESS



Spine COE[®] Survey White Paper
Executive Summary Edition

JUNE 2009



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To review the complete list of topics and questions incorporated in this assessment and study, a PDF version of the Spine COE Survey can be accessed online at www.neustrategy.com or www.spinemark.com.

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FOREWORD

Altering Spine Care's Basic Anatomy

Back pain – it is as common and widespread as the common cold. And yet treating back pain and spinal disorders is not a simple process. Spine care is increasingly complex, often involving additional psychosocial, physical and physiological factors that both the patient and clinician must recognize and manage.

To make real and significant progress in treating back pain and to deliver appropriate spine care, clinicians and program directors must embrace this growing complexity, minimize assumptions and improve measurable outcomes. We cannot assume that if a patient's pain persists despite conservative treatment, more aggressive treatment is always the answer. We cannot assume that if no other interventions relieve a patient's back pain, surgery will.

Instead, and as the findings of the Spine COE research indicate, providers will be better served by adopting a more integrated approach to spine care delivery. The benefits of such a model are clear. First, integrated care includes alternatives that are often overlooked, such as the psychological aspects of pain or the potential relief from complementary and alternative medicine. Second, and perhaps most critically, a highly integrated, collaborative approach to spine care holds great potential for increasing the effectiveness of outcomes measurement. As we move collectively toward more clearly defined, consistent measures of good clinical and surgical programs and outcomes, we not only improve the care we deliver today, but we build a valuable understanding of the increasingly complex variables that impact tomorrow's spine care as well.

We hope *Defining Comprehensive Spine Care* adds to a growing body of research necessary to establish an industry-wide model for spine program development.

Sincerely,

Edward Benzel, M.D.
Chairman of the Department of Neurosurgery
Cleveland Clinic

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Meeting the Spine Market Challenge

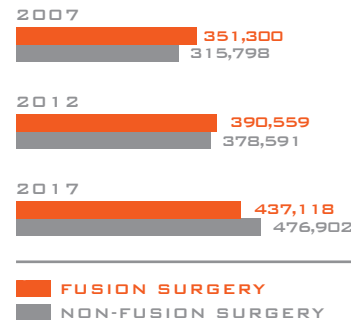
Never have the costs, controversies and opportunities surrounding spine care loomed larger. Only a handful of inpatient operating room procedures – coronary bypass, Caesarean delivery and knee replacement surgeries for example – tally higher aggregate costs than spinal fusion surgery, according to the Agency for Healthcare Research and Quality. Inpatient spinal fusion alone totaled 300,000 procedures and \$16 billion in hospital charges in 2004. Inpatient laminectomies and intervertebral disc excisions represented an additional 242,000 inpatient procedures and \$5 billion in hospital charges. And surgery is only one component of comprehensive spine care. Non-surgical treatment typically accounts for 90% of spine volume and 60% of revenue: spine-related diagnostics, spinal injections and complementary and alternative medicine (CAM) tally approximately \$4.2 billion, \$2.3 billion and \$26.1 billion, respectively, in annual costs.

Competition to capture these procedures is growing right in step with the projected patient population. Professional surgical associations report that back pain remains one of the five primary reasons patients go to the emergency room. The American Association of Neurological Surgeons (AANS) report that approximately 4.6 million Americans will need back surgery at some point in their lives. The Advisory Board Company (ABC) estimates that spine surgery will increase 37% from 2007-2017. The move toward the outpatient setting alone for fusion surgery will increase 438% over the same time period. Multiple factors are contributing to this growth in surgery and changes in care setting: the aging U.S. population, improved anesthesia to treat aging patients, minimally-invasive surgical techniques, improved spinal fixation devices, advanced technologies such as computer-guided surgery, and even bone graft substitutes such as bone morphogenetic proteins.

Along with this demand comes increased health policy pressure to develop data that substantiates quality care. As a bipartisan panel of policy leaders recently wrote in *The New York Times*: “A health care system that is driven by robust comparative clinical evidence will save lives and money.” Pay for performance is taking root, adding pressure, and payers are no longer

alone in the demand for measurable, cost-effective care. Device manufacturers and even physicians face increased regulatory scrutiny. And from Core Measures to the Certification of Specialty Centers, the Joint Commission will continue to crunch numbers and further refine standards of care.

US Spine Surgery Volume Projection



Source: Advisory Board Company

All of this comes at a time when indications for spine intervention are widening and reimbursement remains dynamic at best. And in every corner, consumers are seeking quality indicators, whether it's HealthGrades®, 100 Top Hospitals®, or *U.S. News and World Report*. This increasingly health- and Internet-savvy patient population will use subjective sources until hospitals and advocacy groups emerge with standardized measures that thoughtfully define healthcare quality.

Clearly, now more than ever, providers must meet the challenge to deliver spine services that demonstrate focused care, with an emphasis on performance, value and patient-centered quality outcomes. The economic challenge of delivering care necessitates differentiation, interdisciplinary collaboration, cost transparency and accountability.

In this climate of change and growth, NeuStrategy and SpineMark provide the following comprehensive analysis to shape answers to the question: What should comprise a Spine Center of Excellence (COE®)? The goal is to better reveal spine program infrastructure components that support excellent care, and, ultimately, to help healthcare decision makers shape the criteria that will better define and standardize Spine COEs.

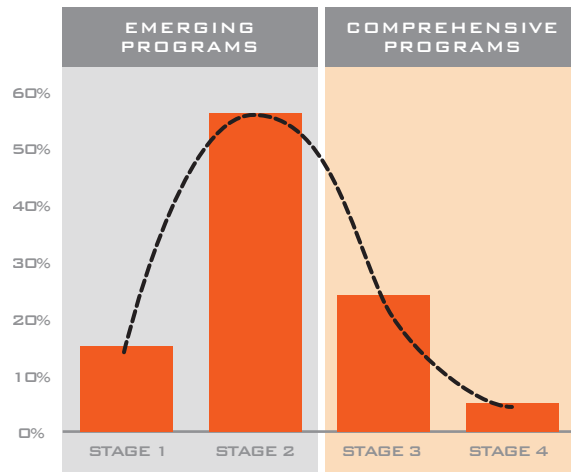
NeuStrategy and SpineMark collaborated to develop the first-ever Spine COE Survey. Based on the COE Model, the survey identifies the infrastructural elements that support excellent care in four categories: Programs, Staff, Facility & Technology, and Business. The Spine COE Survey, fielded as a web-based survey in the winter of 2008, represents findings from 99 hospitals and spine programs across 35 states and 3 international locations. The responses from each participating organization are self-reported. (The survey remains open to participation. See details in the Appendix if your organization would like to complete the survey.)

With the direction of a clinical advisory committee, each survey question was weighted according to a proprietary algorithm and provided a score. The score places each organization within one of four stages:

- Stage 1:** Clinical Service
- Stage 2:** Service Line
- Stage 3:** Specialty Center
- Stage 4:** Institute

Respondents scoring above the 50% benchmark are further categorized as a Comprehensive Program (CP). Those below the benchmark are considered Emerging Programs (EPs.)

Distribution of Spine COE Survey Respondents



A top line look: CPs are more likely to be academic hospitals while both CPs and EPs are most often community hospitals with teaching accreditation. The CP is also more likely to feature a Level I Trauma Center. And yet interestingly, spine program stature is not a function of sheer size: both EPs and CPs typically staff between 250 and 499 beds.



Executive Summary

Program Findings

- CPs provide greater access to minimally invasive spine surgeries – a critical distinction given industry growth forecasts of 30% or higher annually in some of these procedures
- CPs tackle tough conditions, offering treatments that do not typically drive volume, but instead demonstrate clinical depth
- For nearly all of the 30 surveyed procedures, a CP is at least twice and often three times more likely to follow spine clinical pathways
- Outcomes tracking is a key point of differentiation; while CPs are more likely to track outcomes, both groups have room to improve evidence-based outcomes measurement
- CPs are significantly more likely to conduct and leverage clinical research to drive leadership as they readily publish results in peer-reviewed journals

Staff Findings

- CPs are twice as likely as EPs to retain an interdisciplinary team of surgeons and allied professionals
- The most common functions of these multidisciplinary teams: spine program planning, device review, performance indicator planning and patient care team conferencing
- Allied professionals are active in CP teams and typically include physical therapists, a spine unit coordinator, physician assistants and nurse practitioners

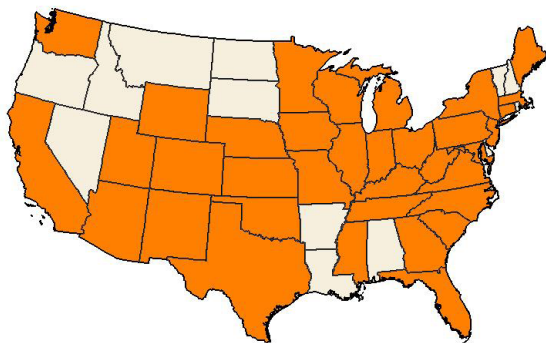
Facility & Technology Findings

- Spine CPs are focused on creating a specialty care environment with a reliance on diverse technologies that sets them apart
- The CP's greater use of allied professionals is reflected in its facilities – four in five have dedicated spine operating rooms as well as specialty units with dedicated beds
- CPs are significantly better equipped for image-guided and endoscopic surgery

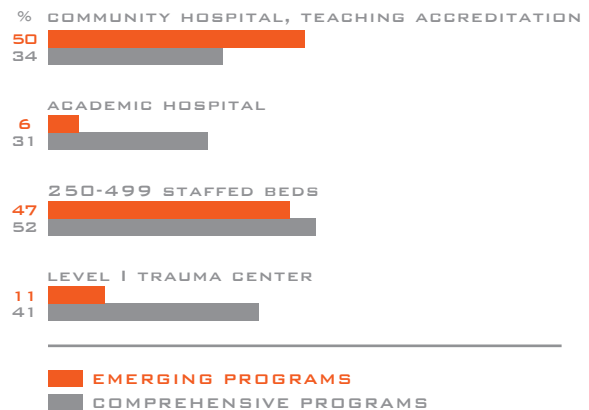
Business Findings

- Nine in ten CPs have an ambulatory surgery center (ASC) compared to just six in ten EPs – another signal they may be better positioned for outpatient spine surgery growth
- Though the regulatory environment has tightened significantly over the past two years, CPs are 80% more likely to have hospital-physician joint venture ASCs – among those with these arrangements, both CPs and EPs report no negative impact and cite growing market share as the primary positive impact
- CPs are at least twice as likely to budget for spine-specific marketing and outreach. Patient education, screening programs, back schools and mechanics classes serve as their key methods of outreach

■ States with Spine COE Survey Participants (35)



SPINE COE® SURVEY RESPONDENT PROFILE



Report Card

How to Interpret Your Results

Thank you for participating in the NeuStrategy and SpineMark Spine COE Survey – the most comprehensive study of its kind, designed and implemented to foster growth and understanding of evidence-based spine care and program development.

The following pages provide your individualized Spine COE Survey Report Card, which reflects a score based upon the survey responses you provided. Comparing your scores against the performance of other organizations provides powerful insight and perspective for your strategic planning. You can quickly identify critical gaps, assess areas of potential growth and plan for improvement. Moreover, you can identify key categories to help you position, focus and then track your program’s success.

About Your Score

Your report card represents an aggregate score, which places your spine program within one of four stages:

- Scores of 75-100% are a Stage 4: Institute
- Scores of 50-74% are a Stage 3: Specialty Center
- Scores of 25-49% are a Stage 2: Service Line
- Scores of 0-24% are a Stage 1: Clinical Service Program

Additionally, your report card allows you to compare your score to three benchmarks: all survey participants, those categorized as Emerging Programs (EPs) and those grouped as Comprehensive Programs (CPs).

Respondents scoring above the established 50% benchmark are categorized as a CP. Those below the benchmark are considered an EP. Each participant’s score is based on the self-reported answers from the survey. With the direction of a clinical advisory committee, each answer was ranked and weighted according to a proprietary algorithm. The question and topic ranking was based on four criteria descriptions noted in the table to the right.

As the basis for defining and measuring program infrastructure, NeuStrategy and SpineMark assigned

all survey questions and responses to one of four key components in its proprietary COE Model: Programs, Staff, Facility & Technology and Business. Each section of the report card represents aggregate analytical data and provides national benchmarks to help organizations objectively identify the strengths and gaps in their spine programs.

Programs — measures the depth and breadth of the current spine care offerings, clinical research, and adherence to clinical pathways and measurements.

Staff — includes a thorough assessment of physician, nursing, allied professionals, complementary medicine, administrative support, as well as the training and education of spine care professionals.

Facility & Technology — reviews the array of technology, on-site and off-site services, real estate, diagnostic imaging and state-of-the-art procedural and surgical capabilities.

Business — includes an assessment of governance, management leadership, financial support, marketing, communications and community outreach and education.

Question and Topic Ranking Criteria

IV	<ul style="list-style-type: none"> • Program elements and procedures that distinguish a comprehensive spine program • Elements not available or appropriate in all centers based on advanced nature of such elements • Significant level of financial investment from a facility and technology standpoint
III	<ul style="list-style-type: none"> • Program elements that begin to differentiate the more common and esoteric procedures • Elements available or appropriate to include in many spine programs, though not all • Financial investment from a facility/technology standpoint between a necessary tool and a nice-to-have element
II	<ul style="list-style-type: none"> • Program elements that are the most common and incorporated into the majority of programs • Elements available or appropriate to include in all spine programs • Basic financial investment required to support the most common program elements and procedures
I	<ul style="list-style-type: none"> • Not an influential element for assessing program infrastructure

Your Spine COE Survey Report Card

The Spine COE Survey Report Card is a "quick-look" at the key drivers of infrastructure and performance within your spine program. Your score in each COE component category is a comparison of your program to the average score of all survey participants, comprehensive programs and emerging programs.

If your score is higher than the average, this may represent a possible strength or positive attribute of your program. Conversely, if your score falls below the mean, this could represent an area for potential improvement.

Sample Report

Spine COE Survey Score: 65%

Program Designation: Comprehensive Program

Surveyed Components		Your Score	Average Score	Comprehensive Programs	Emerging Programs
Programs		58%	40%	59%	32%
	Clinical	68%	51%	73%	41%
	Research	27%	11%	21%	7%
Staff		53%	34%	53%	25%
	Medical	46%	30%	45%	23%
	Administrative & Allied Health	60%	37%	60%	27%
Facility & Technology		71%	47%	68%	38%
	Facility	61%	41%	60%	33%
	Technology	77%	51%	73%	41%
Business		78%	40%	63%	29%
	Leadership & Governance	82%	48%	76%	36%
	Marketing & Outreach	71%	30%	55%	19%
	Financial Support	82%	39%	55%	31%
Spine COE Total Score		65%	41%	61%	32%

Conclusion

The Chinese proverb “May you live in interesting times” is reputed to be both a blessing and curse. That proverb in many ways describes the state of delivering U.S. medical care today. We achieve technological and clinical wonders, but all come at a price. The delivery of quality spine care is no exception to that trend. In the end, like all of medicine, the mandate is clear: develop quantifiable data necessary to balance cost with quality outcomes.

The Spine COE Survey data show a spine care climate rich with opportunities to nurture excellence while also growing service. Decision makers must survey the continuum of care to forge growth opportunities; as the data demonstrate, this may include tighter linking of inpatient-to-outpatient services, greater collaboration between disciplines, a commitment to preventive measures (such as patient education) and a rapid movement to incorporate outcomes tracking into all aspects of care.

In these “interesting” times, such decisions and their results must be cost effective, measurable and quality driven. To meet that challenge, information will be power. Information will foster and reinforce collaboration and agreement on what constitutes excellent care.

This Spine COE Survey has identified the practice patterns, staffing and infrastructure requirements of comprehensive programs. Such data can help the industry’s thought leaders establish standards for spine program certification. In a healthcare climate poised for constant change, having the quantifiable data necessary to balance cost with outcomes will only become more essential to a program’s very survival.

Appendix

About the Spine COE[®] Survey

Fielded in the winter of 2008, NeuStrategy, Inc. and SpineMark Corporation collaborated to develop the first-ever Spine COE Survey, the second subspecialty survey within NeuStrategy's COE Survey Series and based on NeuStrategy's proprietary COE Model. Fielded as a web-based survey, 99 hospitals and spine programs across 35 states and three international locations participated in the initial release. The responses from each participating organization are self-reported.

Developed in collaboration with a clinical advisory committee comprised of physicians, nurses and industry experts, each survey question and answer was weighted according to a proprietary algorithm. Respondents scoring above a 50% benchmark are categorized as a Comprehensive Program (CP). Those below the benchmark are considered Emerging Programs (EPs). This white paper discusses the differences between emerging programs and comprehensive programs. The following details the profile of participants:

- Respondent Organization Profile
 - 69 respondents are categorized as an Emerging Program
 - 30 respondents are categorized as a Comprehensive Program

ACCREDITED TEACHING TYPE	EMERGING PROGRAMS	COMPREHENSIVE PROGRAMS
ACADEMIC FACILITY	6%	32%
COMMUNITY FACILITY - ACCREDITED FOR TEACHING	52%	36%
COMMUNITY FACILITY - NOT ACCREDITED FOR TEACHING	42%	32%


AVERAGE ANNUAL SURGERY VOLUME	EMERGING PROGRAMS	COMPREHENSIVE PROGRAMS
SPINE NON-FUSION SURGERY	185	457
SPINE FUSION SURGERY	270	516
NON-STRUCTURAL SPINE SURGERY	21	60
TOTAL SPINE SURGERY	476	1,033

LOCATION TYPE	EMERGING PROGRAMS	COMPREHENSIVE PROGRAMS
URBAN	47%	57%
SUBURBAN	44%	36%
RURAL	9%	7%

BED SIZE	EMERGING PROGRAMS	COMPREHENSIVE PROGRAMS
< 50	9%	0%
51-100	5%	0%
100-249	22%	3%
250-499	49%	54%
500-749	10%	29%
750-999	5%	11%
1,000+	0%	3%

Don't Miss Out!

The Spine COE Survey remains open for participation. Email SpineCOESurvey@neustrategy.com to learn more.



SPINE COE SURVEY RESULTS

GET THE FULL DETAILS

Take your spine program to new heights!

Learn more with the 19-page Comprehensive Edition of *Defining Comprehensive Spine Care* – the Spine COE Survey White Paper and your customized copy of the Comprehensive Data Report. This industry report explores the state of spine care and assesses infrastructure and practice patterns – allowing you to see firsthand how comprehensive spine programs compare to emerging spine programs. With detailed analysis for ALL questions in the Spine COE Survey, you'll be able to identify critical program gaps and set a course for further development.

The following two pages provide a sample of the 43-page Comprehensive Data Report. It provides the breakdown of all respondents' answers for each question and would highlight your organization's individual responses.

Complete the Spine COE Survey today and receive your customized Report Card, Comprehensive Edition White Paper and Comprehensive Data Report – all for only \$495. Reports are also available to industry partners and hospital organizations that do not wish to complete the survey.

	Executive Summary White Paper	Comprehensive Edition White Paper and Report Card	Comprehensive Data Report	Custom Benchmark Data Reports*
Initial Release Spine COE Survey Participant**	FREE	FREE	\$295	\$295
New Spine COE Survey Participant	FREE		\$495	\$295
Non-participating Hospitals and Industry Vendors	FREE		\$695	\$295

*Custom Benchmark Reports require the purchase of the Spine COE Survey Comprehensive Reports

**Available only to organizations that contributed to the original dataset in March 2008

Contact a NeuStrategy (312.644.4780) or SpineMark (858.623.8412) representative to learn more about these reports or email SpineCOESurvey@neustrategy.com



Sample Report

Programs - Clinical Programs

Section Score: 68%

Topic	Percent Of Respondents Who Chose Each Answer
-------	---

Characterize your hospital's spine patients:

Adult Only	41%
Pediatric Only	0%
Adult and LIMITED Pediatric (e.g., older children)	43%
* Adult and FULL Pediatric	17%

Indicate which spine conditions your hospital treats:

Back Strains and Sprains

* Treat	93%
Do Not Treat	7%

Herniated Discs (e.g., myelopathy, radiculopathy, etc.)

* Treat	99%
Do Not Treat	1%

Degenerative Disc Disease (e.g., stenosis, facet arthropathy, osteoporosis)

* Treat	100%
Do Not Treat	0%

Non-traumatic Fractures (e.g., spondylosis, osteoporosis)

* Treat	98%
Do Not Treat	2%

Traumatic Fractures (e.g., vehicular accidents, falls)

* Treat	87%
Do Not Treat	13%

Spinal Cord Injury Acute Treatment

* Treat	70%
Do Not Treat	30%

Spinal Cord Injury Rehabilitation

* Treat	58%
Do Not Treat	42%

Inflammatory Disorders (e.g., arachnoiditis, discitis, spondylitis)

* Treat	93%
Do Not Treat	7%

Idiopathic Peripheral Pain

* Treat	91%
Do Not Treat	9%

Infectious Spine Conditions (i.e., bacterial or viral)

* Treat	87%
Do Not Treat	13%

Deformities (e.g., scoliosis, kyphosis, spondylolisthesis)

* Treat	88%
Do Not Treat	12%

Malformations (e.g., Chiari, craniocervical junction, spina bifida)

* Treat	68%
Do Not Treat	32%

Sample Report

Programs - Clinical Programs

Section Score: 68%

Topic	Percent Of Respondents Who Chose Each Answer
--------------	---

Indicate which spine conditions your hospital treats:

Failed Back Syndrome	
* Treat	91%
Do Not Treat	9%
Spinal Cord Tumors (i.e., benign, malignant or metastatic)	
* Treat	88%
Do Not Treat	13%
Peripheral Nerve Tumors (i.e., benign, malignant or metastatic)	
* Treat	78%
Do Not Treat	22%
Spine Vascular Conditions (e.g., AVM, angiogenesis)	
* Treat	69%
Do Not Treat	31%
Autoimmune or Acquired Disorders (e.g., ankylosing spondylitis, multiple sclerosis)	
* Treat	77%
Do Not Treat	23%

Indicate which specialty performs the following procedures or if any services are in development or planned (check all that apply):

Traditional Laminectomy/Discectomy	
* Neurosurgeon	89%
* Orthopedic Surgeon	70%
Other Physician	1%
Under Development or Planned in 1-2 Years	1%
Minimally Invasive Laminectomy/Discectomy	
* Neurosurgeon	84%
* Orthopedic Surgeon	53%
Other Physician	1%
Under Development or Planned in 1-2 Years	4%
Laser Microdiscectomy	
Neurosurgeon	57%
* Orthopedic Surgeon	19%
Other Physician	7%
Under Development or Planned in 1-2 Years	31%
Endoscopic Microdiscectomy	
* Neurosurgeon	78%
* Orthopedic Surgeon	36%
Other Physician	3%
Under Development or Planned in 1-2 Years	13%
Cervical Fusion	
* Neurosurgeon	91%
* Orthopedic Surgeon	63%
Other Physician	0%
Under Development or Planned in 1-2 Years	0%

About NeuStrategy, Inc.

NeuStrategy is rooted in a legacy of focused healthcare industry expertise. As the creator of the COE[®] Survey Series, we provide a broad spectrum of strategic, financial and operational support to health systems, physician practices and industry vendors focused on neuroscience, orthopedic and oncology services. Our products, services and partnerships deliver the intelligence and resources organizations need to succeed in today's fast-paced healthcare environment. NeuStrategy principals and team of advisory consultants have completed more than 150 customized neuroscience, orthopedic and oncology specialty healthcare engagements for academic and community health systems across the country.

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About SpineMark Corporation

SpineMark Corporation is an innovative service organization dedicated to transforming the delivery of spine care. The company partners with hospitals and physicians across the United States and globally to develop and operate comprehensive, evidence-based spine centers of excellence. By building a global network of spine centers, spine research organizations and state-of-the-art medical conference facilities, SpineMark is improving the overall quality of life of patients afflicted with spine disorders and injuries. Driven by the specialized experience and expertise of its leadership team and medical advisory board, SpineMark maintains high standards for spine care in its global network, creating clinically validated best practices for spine care that streamline diagnosis and treatment, simplify referrals and accelerate the recovery process.



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