The Future of Spine Care
Landscape and Key Trends

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Sr Director, Intelligence, Sg2

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Spine Landscape

- Workforce
- Increasing Complexity
- Value
- Evolving Consumer Expectations
- Physician-Hospital Dynamics
- Clinical Advances and Innovation
- Payment and Policy
- Site of Care Shifts
- Growth
Evolve Your System of Care

1. Prepare for rising patient acuity
2. Anticipate site of care shifts
3. Reactivate upstream channel strategy
4. Recruit, retain and reimagine workforce
5. Demonstrate Value
Innovation in Spine Takes Many Forms

OVERVIEW
- Continued competition
- Increasing precision, decreasing invasiveness
- Budget constraints, heightened scrutiny around adoption
- For health systems and physicians, some innovations will be “baked in”—others will require programmatic or care delivery change.

Selected Examples

Diagnosis
- Computational imaging techniques
- Portable technologies (eg, MRI, CT)
  - Lower cost
  - Broader accessibility
  - Extend workforce; reduce training burden
- Enhanced accessibility

Treatment:
- Increasing precision, decreasing invasiveness
- AI to inform treatment decisions (eg, patient selection, outcome prediction in deformity)
- Robotics and navigation
- Role of VR/AR in planning and execution

Care Delivery:
- Reimagined System of CARE
- Blurring roles
- Nontraditional partnerships, new collaborators and competitors
- Evolving workforce and training needs
Consider the Role of Digital Health to Support a Range of Strategic Imperatives

PRO = patient reported outcomes; RPM = remote patient monitoring; Rx = prescription.

**STRATEGIC IMPERATIVES**
- Improve access to care.
- Increase transparency for patients.
- Grow share of care.
- Streamline care delivery.
- Expand access channels.
- Drive cost reduction, efficiency and increased provider capacity.
- Support ongoing condition management.
- Optimize postdischarge outcomes.
- Manage overall cost of care.

**SELECTED SPINE USE CASES**
- **Virtual Rehab** platforms supporting post-surgical recovery and PRO collection
- **Supporting community**-based physicians (chronic pain)
- **Second opinion** virtual visits
10-Year Spine Surgical Procedures Forecast

Inpatient/Outpatient Select Spine Surgical Procedures Forecast
US Market, 2022–2032

OVERALL SPINE SURGICAL FORECAST

<table>
<thead>
<tr>
<th>Year</th>
<th>3-Year</th>
<th>5-Year</th>
<th>10-Year</th>
<th>Cervical Fusion</th>
<th>Lumbar/Thoracic Fusion</th>
<th>Spinal Decompression</th>
<th>Motion Preservation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Volumes</td>
<td>1.5M</td>
<td>238K</td>
<td>302K</td>
<td>455K</td>
<td>50K</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Note:** Analysis excludes 0–17 age group and includes the spine service line only. Overall spine surgical forecast includes IP major therapeutic and OP major procedures groups. **Sources:** Impact of Change®, 2022; HCUP National Inpatient Sample (NIS), Healthcare Cost and Utilization Project (HCUP) 2019, Agency for Healthcare Research and Quality, Rockville, MD; Proprietary Sg2 All-Payer Claims Data Set, 2019; IQVIA; The following 2019 CMS Limited Data Sets (LDS): Carrier, Denominator, Home Health Agency, Hospice, Outpatient, Skilled Nursing Facility; Claritas Pop-Facts®, 2022; Sg2 Analysis, 2022.

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Spine Surgery Shifts Outpatient Amid Payment and Policy Change and Pandemic

Lumbar/Thoracic Spinal Fusion, Q4 2019–Q4 2021
Strata Decision Technology

Note: Analysis includes 18+ age group, spine service line, inpatient and hospital outpatient volumes only. Sources: Strata Decision Technology National Patient and Procedure Tracker (2019–2021); Sg2 Analysis, 2022.

ANTICIPATE SHIFTS

Drivers
- Removed from CMS Inpatient Only list (2020–2021)
- LOS reduction efforts
- Enhanced recovery elements (Enhanced Recovery After Surgery [ERAS])
- Tech/anesthesia advances
- Patient selection/monitoring
Spine Surgery Forecast
Policy Changes, COVID-19 Pandemic, and Economic Pressures Accelerate HOPD/ASC Shift

**Spine Surgery Forecast**

**Sg2 10-Year Growth Projections**

**US Market, 2022–2032**

**Cervical Fusion**
- 2027: 64% IP, 36% OP
- 2032: 67% IP, 33% OP

**Lumbar/Thoracic Spinal Fusion**
- 2027: 26% IP, 74% OP
- 2032: 32% IP, 68% OP

**Sources:** Impact of Change®, 2022; Proprietary Sg2 All-Payer Claims Data Set, 2019; The following 2019 CMS Limited Data Sets (LDS): Carrier, Denominator, Home Health Agency, Hospice, Outpatient, Skilled Nursing Facility; Claritas Pop-Facts®, 2022; Sg2 Analysis, 2022.

**HOW**
- LOS reduction efforts
- Enhanced recovery elements
- Tech/anesthesia advances
- ASC infrastructure
- Patient selection/monitoring

**Note:** Analysis excludes 0–17 age group. Spine includes spine service line, IP and OP major therapeutic procedures groups only.
Cervical Fusion Commercial Snapshot: Some Markets Approach OP Shift Ceiling While ASC Shift Remains Limited and Varies Across Markets

Cervical Fusion %OP, Commercial Claims, 2021 Q1-Q3

Cervical Fusion %ASC, Commercial Claims, 2021 Q1-Q3

Notes: Analysis excludes 0-17 age group and includes commercial claims only. Cervical Fusion includes cervical spinal fusion and Degenerative Spine and Disc Injury CARE Family only. %OP includes hospital outpatient department and ambulatory surgery centers. %ASC includes ambulatory surgery centers only. Sources: Proprietary Sg2 All-Payer Claims Data Set; IQVIA; Sg2 Analysis, 2022.
Know Your Ambulatory Strategy, Know Your Market

CONSIDERATIONS

REGULATORY—CON, credentialing and certifications

CLINICAL—Physician comfort, workforce, clinical innovation and technology

STRATEGIC—Physician alignment, hospital capacity and efficiency, consumerism

FINANCIAL—Volume, reimbursement, construction and plant considerations, supply chain

Navigating Site of Care Shifts

- Evaluate market-specific brakes and accelerators.
- Develop patient selection criteria.
- Ensure effective cost management and operational efficiency, including smart technology adoption.
- Revisit comprehensive program development.
10-Year Spine Forecast: Surgical Shifts Are Critical but Are Not the Whole Picture

Spine Volumes
Impact of Change® 2022, 2022–2032

<table>
<thead>
<tr>
<th>Service</th>
<th>Sg2 Inpatient Forecast</th>
<th>Sg2 Outpatient Forecast</th>
<th>Population-Based Forecast</th>
</tr>
</thead>
<tbody>
<tr>
<td>IP Surgical Admissions</td>
<td>–8%</td>
<td>15%</td>
<td></td>
</tr>
<tr>
<td>Advanced Imaging</td>
<td></td>
<td>7%</td>
<td>14%</td>
</tr>
<tr>
<td>Arthrocentesis/Injections</td>
<td></td>
<td>8%</td>
<td>16%</td>
</tr>
<tr>
<td>PT/OT Evaluation</td>
<td></td>
<td>13%</td>
<td>25%</td>
</tr>
<tr>
<td>PT/OT Therapy</td>
<td></td>
<td>2%</td>
<td>11%</td>
</tr>
<tr>
<td>Standard Imaging</td>
<td></td>
<td>7%</td>
<td>12%</td>
</tr>
<tr>
<td>E&amp;M Visits</td>
<td></td>
<td>15%</td>
<td>11%</td>
</tr>
</tbody>
</table>

Note: Analysis excludes 0–17 age group. Advanced imaging includes CT, MRI and positron emission tomography. Standard imaging includes nuclear medicine/SPECT, ultrasound and x-ray. SPECT = single photon emission computed tomography. Sources: Impact of Change®, 2022; HCUP National Inpatient Sample (NIS), Healthcare Cost and Utilization Project (HCUP) 2019. Agency for Healthcare Research and Quality, Rockville, MD; Proprietary Sg2 All-Payer Claims Data Set, 2019; The following 2019 CMS Limited Data Sets (LDS): Carrier, Denominator, Home Health Agency, Hospice, Outpatient, Skilled Nursing Facility; Claritas Pop-Facts®, 2022; Sg2 Analysis, 2022.

FORECAST HIGHLIGHTS

Rising IP acuity case mix: A growing portion of surgical cases shift to outpatient and ambulatory settings; however, complex cases remain IP.

Advanced imaging: While payer scrutiny continues, growth resumes as opportunities for utilization reduction have been partially realized.

OP rehab: As the role of PT evolves, therapists see more patients while care redesign and virtual rehab reduce per episode follow-up postoperative visits.
Adopt a Consumer’s Vantage Point to Inform Growth Strategy

WHAT DO CONSUMERS WANT?

Almost 3 in 4 survey respondents said they prefer a **one-stop shop** for health care services.

Complex interplay between cost, quality and convenience

<table>
<thead>
<tr>
<th></th>
<th>Physical Therapy/Rehab</th>
<th>Advanced Imaging</th>
<th>Elective Surgery or Procedure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cost</td>
<td>44%</td>
<td>40%</td>
<td>53%</td>
</tr>
<tr>
<td>Quality</td>
<td>37%</td>
<td>46%</td>
<td>40%</td>
</tr>
<tr>
<td>Convenience/Access</td>
<td>19%</td>
<td>14%</td>
<td>7%</td>
</tr>
</tbody>
</table>

COVID-19 Impact:
- Shifting expectations and shifting consumers (“urban shuffle”; work from home)
- Lingering safety concerns; economic hardship

Note: Survey was fielded in December 2019, before the COVID-19 pandemic. Sources: Sg2 National Health Care Consumerism and Insurance Coverage Survey. 2018; Sg2 National Health Care Consumerism and Insurance Coverage Survey. December 2019.

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Address Disparities in Spine for Broader Consumer Connection

**DIVERSITY MATTERS**
Provider diversity impacts patient care and outcomes. Fewer than 4% of neurosurgeons in the US are Black.

**DISPARITIES PERSIST**
2022 meta-analysis: Minority patients less likely to undergo spine surgery, more likely to receive surgery from low-volume providers, more likely to experience post-operative complications.

**UTILIZATION AND OUTCOMES VARY**
An analysis of elective spine surgery cases using the Washington State Surgical Clinical Outcomes Assessment Program Database found that minority groups were less likely to have conservative management prior to surgery, less likely to be discharged home, and more likely to have post-operative complications compared to white patients.

Sources: The Spine Journal, Volume 22, Issue 9, Supplement, September 2022, Page S52; World Neurosurg. 2021 Jan;145:197-204; World Neurosurg. 2022 Feb;158:290-304.e1; Sg2 Analysis 2022

**Pursue Proactive Outreach**
**Widen Geographic Access**
**Tailor Counseling Interventions**
**Reactivate Upstream**
Comprehensive Programs Demonstrate Value to Payers and Employers, Patients, and Physicians

Common Elements of Comprehensive Programs

<table>
<thead>
<tr>
<th><strong>SPINE</strong></th>
<th>Connect the dots for patients</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Multidisciplinary Offerings</strong></td>
<td>Ensure access and operational effectiveness</td>
</tr>
<tr>
<td>- Conservative care</td>
<td>Demonstrate multidisciplinary approach</td>
</tr>
<tr>
<td>- Pain management (yes, chronic pain too!)</td>
<td>Deliver high-quality care across sites</td>
</tr>
<tr>
<td>- Surgical intervention</td>
<td>Focus on metrics that matter</td>
</tr>
<tr>
<td><strong>Access</strong></td>
<td></td>
</tr>
<tr>
<td>- Defined entry point</td>
<td></td>
</tr>
<tr>
<td>- Timely evaluation and interventions</td>
<td></td>
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<tr>
<td>- Dedicated care coordinator/patient navigator</td>
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</tr>
<tr>
<td>- Clear care paths</td>
<td></td>
</tr>
<tr>
<td><strong>Triage</strong></td>
<td></td>
</tr>
<tr>
<td>- Standardized intake process/forms</td>
<td></td>
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<tr>
<td>- Physician-directed referral algorithms</td>
<td></td>
</tr>
<tr>
<td>- Unbiased gatekeeper</td>
<td></td>
</tr>
<tr>
<td><strong>Communication</strong></td>
<td></td>
</tr>
<tr>
<td>- Multidisciplinary case review</td>
<td></td>
</tr>
<tr>
<td>- Regular follow-up with referring physicians</td>
<td></td>
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<tr>
<td>- Collection, analysis and reporting of outcomes</td>
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</table>
Spine Landscape

- **Brace** for continued policy whiplash and lingering pandemic disruptions.
- **Balance** the need for adaptability in the short term with long-term planning.
- **Engage**, educate and align clinical and administrative workforce to drive cost reduction and care transformation.

- While many focus on operational challenges, be ready to grow.
  - **Prioritize** growth opportunities in the context of local need, volume opportunity and financial sustainability: *Can you? Should you? And when?*
  - **Establish** a vision and identify core differentiators to guide strategic selection/deselection.
  - **Refine** scorecard metrics to align with programmatic initiatives, and tailor to your audience.
The Future of Spine Care

Appendix
Sg2’s Impact of Change Forecasts

1. Sg2 uses multiple data sources to establish baseline volumes and emerging trends.

2. Sg2 analyzes inputs, organizes data into clinically relevant categories.

3. Sg2 answers your questions using our multicomponent forecasts.

**Sg2 ioC Forecasts**

- Discharges, Volumes, Days, ALOS
- System of CARE
- Sg2 Impact Factors

**CARE** = Clinical Alignment and Resource Effectiveness

Sources: Impact of Change®, 2019; HCUP National Inpatient Sample (NIS), Healthcare Cost and Utilization Project (HCUP) 2016, Agency for Healthcare Research and Quality, Rockville, MD; OptumInsight, 2017; The following 2017 CMS Limited Data Sets (LDS): Carrier, Denominator, Home Health Agency, Hospice, Outpatient, Skilled Nursing Facility; Claritas Pop-Facts®, 2019; Sg2 Analysis, 2021.
10-Year Spine Forecast

**Inpatient Spine Forecast**
US Market, 2022–2032

<table>
<thead>
<tr>
<th>Discharges</th>
<th>5-Year</th>
<th>10-Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>Millions</td>
<td>+8%</td>
<td>+15%</td>
</tr>
<tr>
<td>2022</td>
<td>0.7</td>
<td>0.9</td>
</tr>
<tr>
<td>2027</td>
<td>0.8</td>
<td>0.7</td>
</tr>
<tr>
<td>2032</td>
<td>0.9</td>
<td>0.8</td>
</tr>
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</table>

**Outpatient Spine Forecast**
US Market, 2022–2032

<table>
<thead>
<tr>
<th>Volumes</th>
<th>5-Year</th>
<th>10-Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>Millions</td>
<td>300</td>
<td>700</td>
</tr>
<tr>
<td>2022</td>
<td>300</td>
<td>500</td>
</tr>
<tr>
<td>2027</td>
<td>300</td>
<td>500</td>
</tr>
<tr>
<td>2032</td>
<td>300</td>
<td>500</td>
</tr>
</tbody>
</table>

**Note:** Analysis excludes 0–17 age group and includes the spine service line only. **Sources:** Impact of Change®, 2022; HCUP National Inpatient Sample (NIS). Healthcare Cost and Utilization Project (HCUP) 2019. Agency for Healthcare Research and Quality, Rockville, MD; Proprietary Sg2 All-Payer Claims Data Set, 2019; The following 2019 CMS Limited Data Sets (LDS): Carrier, Denominator, Home Health Agency, Hospice, Outpatient, Skilled Nursing Facility; Claritas Pop-Facts®, 2022; Sg2 Analysis, 2022.
Payment and Policy Trends Demonstrate Rising Pressures Amid Site of Care Shifts

Medicare FFS (Cervical Fusion)

2022 PAYMENT DIFFERENCE FROM IP*

<table>
<thead>
<tr>
<th></th>
<th>IP (DRG 473- Cervical Spinal Fusion w/out CC/MCC)*</th>
<th>Full HOPD (CPT 22551; APC 5115)</th>
<th>Site-Neutral HOPD (CPT 22551; APC 5115)</th>
<th>ASC (CPT 22551)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$16,743</td>
<td>$12,593</td>
<td>$5,037</td>
<td>$8,743</td>
</tr>
</tbody>
</table>

-25%  
-70%  
-48%

# of ASCs specializing in spine surgery:

2013: 35  2019: 145

CMS: Prior Authorization for HOPD implanted spinal neurostimulators and cervical fusion with disc removal (effective July 1, 2021)

Avg. inflation-adjusted change in reimbursement (Top 15 spine surgery CPTs, based on MPFS): -15.6% (2011-2021)

*IP rates do not include adjustments for IME and DSH add-on payments. Add-on payments often result in 5% to 20% increase in DRG payment. HCPCS 22551 = Arthrodesis, anterior interbody, including disc space preparation, discectomy, osteophysectomy and decompression of spinal cord and/or nerve roots; cervical below C2. Note: Based on national Medicare facility payment rates. Full HOPD refers to on-campus or excepted hospital outpatient department (ie, sites exempted from site-neutral payment policies). APC = Ambulatory Payment Classification; ASC = ambulatory surgery center; FFS = fee-for-service; IP = inpatient; HOPD = hospital outpatient department. MPFS = medicare physician fee schedule. Sources: CMS. CY 2022 Final Rule: OPPS/ASC; CMS. FY 2022 Final Rule: IPPS; The Business of Moving Spine Cases to Surgery Centers. Becker’s ASC Review. Sep 15, 2020; J Neurosurg Spine. 2022 Mar 25;1-8; All sources accessed April 2022. Sg2 Analysis, 2022.
Sg2, a Vizient company, is the health care industry's premier authority on health care trends, insights and market analytics. Our analytics and expertise help hospitals and health systems achieve sustainable growth and ensure ongoing market relevance through the development of an effective System of CARE.

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