Building Your Spine Ecosystem:

Leveraging a System of CARE Approach to Improve Outcomes and Drive Sustainable Growth

Kristi Crowe
Principal, Sg2

Alpesh Patel, MD, FACS
Professor, Co-Director, Northwestern Spine Center
Developing a Comprehensive Spine Strategy Can Feel Like Boiling the Ocean

The right spine ecosystem will thrive in both volume and value.
Inpatient Procedures Continue Shift to Outpatient…

**Spine Inpatient Forecast**
US Market, 2017–2027

<table>
<thead>
<tr>
<th>Year</th>
<th>Discharges Millions</th>
<th>5-Year Change</th>
<th>10-Year Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>2017</td>
<td>0.6</td>
<td>+9%</td>
<td>−11%</td>
</tr>
<tr>
<td>2022</td>
<td>0.6</td>
<td></td>
<td>−16%</td>
</tr>
<tr>
<td>2027</td>
<td>0.8</td>
<td>+18%</td>
<td></td>
</tr>
</tbody>
</table>

**Spine Outpatient Forecast**
US Market, 2017–2027

<table>
<thead>
<tr>
<th>Year</th>
<th>Volumes Millions</th>
<th>5-Year Change</th>
<th>10-Year Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>2017</td>
<td>420</td>
<td>+6%</td>
<td>+11%</td>
</tr>
<tr>
<td>2022</td>
<td>500</td>
<td>+6%</td>
<td>+11%</td>
</tr>
<tr>
<td>2027</td>
<td>580</td>
<td>+6%</td>
<td>+11%</td>
</tr>
</tbody>
</table>

**Note:** Analysis excludes 0–17 age group. Spine service line only. **Sources:** Impact of Change®, 2017; HCUP National Inpatient Sample (NIS), Healthcare Cost and Utilization Project (HCUP) 2014, Agency for Healthcare Research and Quality, Rockville, MD; OptumInsight, 2015; The following 2015 CMS Limited Data Sets (LDS): Carrier, Denominator, Home Health Agency, Hospice, Outpatient, Skilled Nursing Facility; Claritas Pop-Facts®, 2017; Sg2 Analysis, 2017.
Spine Surgical Volumes
IP and OP, US Market, 2017
Total Volume: 1.4M

- 8% Neurostimulator Procedures
- 7% Other
- 16% Lumbar/Thoracic Fusion
- 17% Cervical Fusion
- 41% Spinal Decompression
- 1% Revisions
- 8% Vertebral Augmentation
- 1% Motion Preservation

Spine Surgical Forecast
IP and OP, US Market, 2017–2027

We’ve Reached a Tipping Point…
…But Adoption Varies Substantially by Region…and Market

Sources: Sg2 Ambulatory Market Strategist; Health Intelligence Company, LLC; Sg2 Analysis, 2017.
Sg2 Anticipates Leveling of The Spine Landscape

Spine Outpatient Forecast
US Market, 2017–2027

- Rehab
  - Initial Evaluations: 13%
  - Follow-up Visits: 10%

- Advanced Imaging
  - Post-Acute Services: 0%
  - Minor Procedures: 0%

- Standard Imaging
  - Visits: 12%

Outpatient Procedure Forecast
US Market, 2017–2027

- Rehab: Initial Evaluations: 37%
- Rehab: Follow-up Visits: 16%
- Rehab: Chiropractic Visits: 10%

Building Your Spine Ecosystem Works in Both the Volume and Value World

Orthopedic IP & OP Volumes
US Market, 2017
Total Volume: 542M

IP vs OP Weighted Revenue
US Spine Market,
2016 Medicare Payment Rates

Inpatient
~$12B

Outpatient
~$34B

What Does Good Look Like?
CS – I see a full page photo that somehow represents the concept of this question
The “Whomever” Model is Costly

The “Whomever” Model is Costly

CHIROPRACTIC CARE ➔ PCP EVALUATION ➔ MRI

SURGEON EVALUATION ➔ MRI ➔ PCP EVALUATION

PHYSIATRIST EVALUATION ➔ NCV TESTING ➔ INJECTIONS

COST = $10,000

...And The Patient Still Might Not Be Better

NCV = nerve conduction velocity.
But So Is The Direct to Surgeon Model
We’ve Got It! Let’s Use The Physiatry Gatekeeper Model

PHYSIATRY

Mandatory physiatrist consultation prior to surgery doesn’t always deliver the triple aim

How Do Back Pain Patients Choose Their Providers?

Emergency Department
Next Exit

Next Provider Available
20 Miles and 3 Weeks

SPEED LIMIT 55
A Spine Program can Take Many Forms

Collocation Models
Mayfield Clinic (Cincinnati)
- Co-located neurosurgeons, PM&R and rehab in central location
- Select PM&R physicians are focused on evaluation and management of non-operative patients
- Easy access to practice-owned ASC

Virtual Models
St. Luke’s Health (Kansas City)
- Engaged surgeons and ED physicians in algorithm development
- Established boundaries for overlapping services between specialties
- Establish a provider recruitment strategy to fill perceived gaps in care.

- Patients have easy access to variety of providers in one location.
- Improved communication among complementary providers
- Positioned for value-based contracting and referral steerage
- Reduced referral leakage
- Improved surgical conversion rate
- Enhanced convenience – spine center staff can schedule on PT calendar
- Increased Surgical Growth

ASC = ambulatory surgery center
Sources: Sg2 Interview With Mayfield Clinic; Sg2 Interview With St. Lukes, March 2017.
Confidential and Proprietary © 2017 Sg2
Where Do I Start?
A Playbook for Success

1. Understand Current State
2. Develop Structure
3. Define the Patient Pathway
4. Implement Process
5. Track Results
6. Increase Awareness

Steps:
- Understand Current State
- Develop Structure
- Define the Patient Pathway
- Implement Process
- Track Results
- Increase Awareness

A Playbook for Success

1. Understand Current State
2. Develop Structure
3. Define the Patient Pathway
4. Implement Process
5. Track Results
6. Increase Awareness

Steps:
- Understand Current State
- Develop Structure
- Define the Patient Pathway
- Implement Process
- Track Results
- Increase Awareness

A Playbook for Success

1. Understand Current State
2. Develop Structure
3. Define the Patient Pathway
4. Implement Process
5. Track Results
6. Increase Awareness

Steps:
- Understand Current State
- Develop Structure
- Define the Patient Pathway
- Implement Process
- Track Results
- Increase Awareness

A Playbook for Success

1. Understand Current State
2. Develop Structure
3. Define the Patient Pathway
4. Implement Process
5. Track Results
6. Increase Awareness

Steps:
- Understand Current State
- Develop Structure
- Define the Patient Pathway
- Implement Process
- Track Results
- Increase Awareness

A Playbook for Success

1. Understand Current State
2. Develop Structure
3. Define the Patient Pathway
4. Implement Process
5. Track Results
6. Increase Awareness

Steps:
- Understand Current State
- Develop Structure
- Define the Patient Pathway
- Implement Process
- Track Results
- Increase Awareness
Where are Spine Patients Going for Care?

### Top 10 Specialties as Percent of Total Spine E&M Visits

<table>
<thead>
<tr>
<th>Rank</th>
<th>Specialty</th>
<th>2014</th>
<th>2016</th>
<th>Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Chiropractor</td>
<td>25%</td>
<td>25%</td>
<td>0%</td>
</tr>
<tr>
<td>2</td>
<td>Family Practitioner</td>
<td>15%</td>
<td>15%</td>
<td>0%</td>
</tr>
<tr>
<td>3</td>
<td>Unknown*</td>
<td>15%</td>
<td>12%</td>
<td>−3%</td>
</tr>
<tr>
<td>4</td>
<td>Pain Management Specialist</td>
<td>8%</td>
<td>9%</td>
<td>1%</td>
</tr>
<tr>
<td>5</td>
<td>Internal Medicine</td>
<td>7%</td>
<td>7%</td>
<td>0%</td>
</tr>
<tr>
<td>6</td>
<td>Orthopedic Surgeon</td>
<td>5%</td>
<td>5%</td>
<td>0%</td>
</tr>
<tr>
<td>7</td>
<td>Physical Medicine/Rehab Specialist</td>
<td>4%</td>
<td>4%</td>
<td>0%</td>
</tr>
<tr>
<td>8</td>
<td>Neurosurgeon</td>
<td>4%</td>
<td>4%</td>
<td>0%</td>
</tr>
<tr>
<td>9</td>
<td>Orthopedic Spine Surgeon</td>
<td>3%</td>
<td>3%</td>
<td>0%</td>
</tr>
<tr>
<td>10</td>
<td>Nurse Practitioner—Family Medicine</td>
<td>1%</td>
<td>1%</td>
<td>0%</td>
</tr>
</tbody>
</table>

*Primarily consists of other 9 specialties listed for claims in which providers did not submit their name or provider ID information.

**Note:** Excludes 0–17 age group. Surgeons include orthopedic and spine subspecialties only; primary care provider (PCP) includes internal medicine, family medicine and geriatrics. Volume all. **Sources:** Sg2 Ambulatory Market Strategist, 2017; Health Intelligence Company, LLC; Sg2 Analysis, 2017.
And How Do Provider Relationships Impact That?

Example: Patients who originate with an affiliated PCP and follow this pathway have a 65% chance of ultimately receiving an IP or OP spine surgery at an affiliated facility.

<table>
<thead>
<tr>
<th>PCP Encounter</th>
<th>Spinal Consult</th>
<th>IP/OP Spinal Surgery Location</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>100%</strong> Affiliated PCP (400 surgeries)</td>
<td><strong>60%</strong> Affiliated Spine Surgeon (240)</td>
<td><strong>90%</strong> Affiliated Location (216)</td>
</tr>
<tr>
<td><strong>40%</strong> Nonaffiliated Spine Surgeon (160)</td>
<td><strong>10%</strong> Nonaffiliated Location (24)</td>
<td></td>
</tr>
<tr>
<td><strong>25%</strong> Affiliated Location (40)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>75%</strong> Nonaffiliated Location (120)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Total IP/OP Spinal Surgery Count**
- **Affiliated:** 64% (256)
- **Nonaffiliated:** 36% (144)

**OTHER KEY TAKEAWAYS**
- Affiliated PCPs have 40% leakage to unaffiliated spine surgeons.
- Affiliated spine surgeons have 10% leakage to unaffiliated locations

**NEXT STEP QUESTIONS**
- Which PCPs send patients to unaffiliated spine surgeons?
- Which top unaffiliated spine surgeons receive volumes?
- When patients don’t come to our system for a spinal surgery, where do they go?

**Notes:** Data do not reflect “referrals,” but actual patient activity, which can infer referral patterns; Care Pathway: PCP encounter >180 days > Spine Surgeon visit >180 days > Total Joint Replacement (TJR) IP or OP Procedure Location. PCP = primary care provider. **Sources:** Sg2 Patient Flow 2016; Health Intelligence Company; Healthcare Data Solutions; OptumInsight; Sg2 Analysis, 2017.
Access Channels and Full System of CARE Program Definition are Critical to Future Success

EMG = Electromyography
Confidential and Proprietary © 2017 Sg2
Optimize System of CARE Performance

- Identify where your SoC gaps exist.
- Recognize how utilization of one service impacts use of another.
- Establish the infrastructure to manage your patients upstream to facilitate appropriate utilization.

CARE = Clinical Alignment and Resource Effectiveness; EMG = electromyography.
Sample Spine Program Structure

**Spine Steering Committee**
*Responsible for overall spine program strategy development and execution*

Members: Senior executive champion(s), VP of strategy, orthopedics/neurosciences service line directors, rehabilitation director, and each operational team lead

- **Surgical Operations**
  - Lead: Spine unit nurse manager

- **Outpatient Spine Coordination**
  - Lead: Spine center operations director

- **Business Development and Marketing**
  - Lead: VP of business development

- **Spine Physician Advisory Panel**
  - Lead: Spine program medical director

- **Margin Analysis**
  - Lead: Director of supply chain

- **Primary Care Physician Advisory Panel**
  - Lead: Primary care physician executive
Entry Into the Care Continuum Requires Effective Triage and Navigation

SPINE PATIENTS ENTERING CONTINUUM

Triage

Track 1
“Red flags” indicating immediate surgeon referral

Track 2
Pharmaceuticals or additional diagnostics

Track 3
Evaluation by nonsurgeon MD, PA or NP

Track 4
Chronic pain or addiction management

Track 5
Physical therapy series

85%

Track 6
Therapy early-intervention program

NP = nurse practitioner; PA = physician assistant.
Confidential and Proprietary © 2017 Sg2
Multidisciplinary Conference

- Weekly meeting based on tumor board model
- Mandatory for every lumbar fusion surgery
- Each case is reviewed for approximately 5 to 7 minutes.
- Each participant has an equal vote.

Results

- 58% of patients recommended for surgery found to have nonsurgical options.
- 28% of surgical patients had surgical treatment plan revised.
- Zero 30- or 90-day complications; 90-day readmissions for those who had surgery.

Yesterday’s Metrics Don’t Work in a Retail World

**Old Metrics**
- Readmission rates for spine surgery
- On-time surgical starts
- Length of inpatient stay
- Complication or infection rates
- Preoperative education compliance
- Percentage of patients discharged home
- Wait time to initial evaluation

**New Metrics**
- New patient to surgery ratios in surgeon’s office
- Percentage of compliance with MRI guidelines
- Return-to-work/functional activity time
- Percentage of improvement in functional activities
- Total cost of care for low-back pain episode
- Referral source satisfaction
Your Strategy Execution Road Map

Create a collective vision for your spine ecosystem.

Account for PCP preferences and awareness of services.

Optimize patient utilization of services.

Recognize the benefits of provider co-location.

Maximize your OP rehab footprint.

Design a path of least resistance for consumers.

Be mindful of surgeon preferences.

PCP = primary care provider.
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.

Sg2.com     847.779.5300
### Successful Programs Share Common Critical Elements

#### Common Elements of Comprehensive Spine Programs

<table>
<thead>
<tr>
<th>Access</th>
<th>Defined entry point</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Timely evaluation</td>
</tr>
<tr>
<td></td>
<td>Dedicated care coordinator</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Multidisciplinary Offerings</th>
<th>Conservative care</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Pain management</td>
</tr>
<tr>
<td></td>
<td>Surgical intervention</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Communication</th>
<th>Multidisciplinary case review</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Regular follow-up with referring physicians</td>
</tr>
<tr>
<td></td>
<td>Collection, analysis and reporting of outcomes</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Triage</th>
<th>Standardized intake process/forms</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Physician-directed referral algorithms</td>
</tr>
<tr>
<td></td>
<td>Unbiased gatekeeper</td>
</tr>
</tbody>
</table>

Confidential and Proprietary © 2017 Sg2
Common Elements of Comprehensive Spine Programs

| Adequate Expert Providers | • Spine specialty-trained physical therapists  
|                          | • Advanced practitioners  
|                          | • Pain anesthesiologists  
|                          | • Physiatry  
|                          | • CAM  |
| IT Infrastructure        | • Understand total cost of care  
|                          | • Price and outcomes transparency  
|                          | • Electronic capture of longitudinal patient outcomes  
|                          | • Surgical and non-surgical  |
| Chronic Pain Capabilities | • Addiction specialists  
|                          | • Psychology providers  
|                          | • Involvement of pharmacists  |
# Portfolio Management Is Essential for Spine

## Program Levels

<table>
<thead>
<tr>
<th>Planning</th>
<th>Basic Spine</th>
<th>Intermediate Spine</th>
<th>Comprehensive Spine</th>
</tr>
</thead>
</table>
| Structure | • Multidisciplinary steering committee  
• Program vision  
• Measurable goals | • Strategic consideration of outmigration  
• Clear ambulatory strategy | • Long-term Vision for Recruitment of Providers And Placement of Facilities across Market |
| Vision | | | |

## Clinical Competency

<table>
<thead>
<tr>
<th>Planning</th>
<th>Basic Spine</th>
<th>Intermediate Spine</th>
<th>Comprehensive Spine</th>
</tr>
</thead>
</table>
| Surgeons, PM&R, Pain, OP Therapy  
• Retrospective Pathway Analysis | • Urgent Care, ED strategy  
• Defined referral channels  
• Prospective pathway development | | |

## Outreach

<table>
<thead>
<tr>
<th>Planning</th>
<th>Basic Spine</th>
<th>Intermediate Spine</th>
<th>Comprehensive Spine</th>
</tr>
</thead>
</table>
| Defined PCP strategy  
• Branded materials  
• Hospital outcomes collection | • Centralized triage  
• Outcomes used to market program  
• Measurable Goals | • Tertiary care referrals  
• Employer outreach  
• Virtual health supports patient outreach | |